PUBLIC WORKS DEPARTMENT
10300 TORRE AVENUE
CUPERTINO, CALIFORNIA 95014

PROJECT MANUAL

FOR THE

SERVICE CENTER SHED NO. 3 IMPROVEMENT PROJECT

Bid Date:

February 6, 2018

Project Number: 2017-08

PROJECT MANUAL FOR

Service Center Shed No. 3 Improvement Project

PROJECT NO. 2017-08

REVIEWED BY:

Alex Acenas
Public Works Project Manager

APPROVED BY:

Timm Borden
Director of Public Works

PROJECT DIRECTORY

Project Name: **Service Center Shed No. 3 Improvement Project**

Project Number: 2017-08

Location: 10555 Mary Ave., Cupertino, CA 95014

City Representative:

Alex Acenas
Public Works Department
10300 Torre Avenue
Cupertino, CA 95014
PH: 408-777-3354
FX: 408-777-3333
E-mail: alexa@cupertino.org

Address for Stop Notices:

City of Cupertino
Attn: Alex Acenas
Public Works Department
10300 Torre Avenue
Cupertino, CA 95014
PH: 408-777-3354
FX: 408-777-3333
E-mail: alexa@cupertino.org

Architect of Record:

Bartos Architecture, Inc.
1730 S. Amphlett Blvd., Ste. 225
San Mateo, CA 94402
(650) 340-1221

SEALS PAGE

The Technical Specifications and Plans have been prepared by or under the direction of the following persons.

Mark Bartos, AIA
Bartos Architecture, Inc.

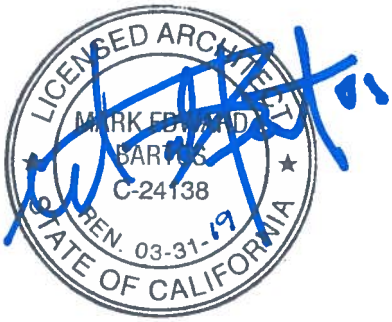

TABLE OF CONTENTS

Notice Inviting Bids

1. **Bid Acceptance.** The City of Cupertino ("City") will accept sealed bids for its Service Center Shed No. 3 Improvement Project ("Project"), by or before Tuesday, February 6, 2018, at 2:00 p.m., at the City Clerk's Office, located at 10300 Torre Avenue, Cupertino, California, 95014 at which time the bids will be publicly opened in the City Hall lobby and read aloud. The City may, acting in its sole discretion, reject any and all bids, and may waive any immaterial deviation from the bid requirements to the full extent permitted by law.

2. **Project Information.**

   2.1 Location and Description. The Project is located at 10555 Mary Ave., Cupertino, CA, and is described as follows:
   Demolition of existing Shed No. 3, construction of a new materials storage shed and associated work as described in the Plans and Specifications.

   2.2 Time for Completion. The planned timeframe for commencement and completion of construction of the Project is: 180 calendar days from the date of the Notice to Proceed.

   2.3 Estimated Cost. The estimated construction cost is $ 350,000.

3. **License and Registration Requirements.**

   3.1 License. This Project requires a valid California contractor's license for the following classification(s): "B" General Building.

   3.2 DIR Registration. City will not accept a Bid Proposal from or enter into the Contract with a bidder, without proof that the bidder is registered with the California Department of Industrial Relations ("DIR") to perform public work under Labor Code section 1725.5, subject to limited legal exceptions.

4. **Contract Documents.** The plans, specifications, bid forms and contract documents for the Project, and any addenda thereto ("Contract Documents") are available in electronic form only, and may be downloaded from City's website under "Open Bids" at: http://www.cupertino.org/i-want-to/bid-on/open-bids and may also be available from a local or regional plan room or trade journal.

5. **Bid Security.** The Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's or certified check made payable to City, or a bid bond executed by a surety licensed to do business in the State of California on the Bid Bond form included with the Contract Documents. The bid security must guarantee that within ten days after City issues the notice of award, the successful bidder will execute the Contract and submit the payment and performance bonds and insurance certificates and endorsements and any other submittals as required by the Contract Documents and specified in the notice of award.

6. **Prevailing Wage Requirements.**

   6.1 General. This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker

needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes.

6.2 Rates**.** These prevailing rates are on file with the City and available online at http://www.dir.ca.gov/DLSR. Each Contractor and Subcontractor must pay no less than the specified rates to all workers employed to work on the Project. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work must be at least time and one-half.

6.3 Compliance. The Contract will be subject to compliance monitoring and enforcement by the DIR, under Labor Code section 1771.4.

7. **Performance and Payment Bonds.** The successful bidder will be required to provide performance and payment bonds, each for 100% of the Contract Price.

8. **Substitution of Securities.** Substitution of appropriate securities in lieu of retention amounts from progress payments is permitted under Public Contract Code section 22300.

9. **Subcontractor List.** Each bidder must submit a completed Subcontractor List form with its Bid Proposal, including the name, location of the place of business, California contractor license number, DIR registration number, and percentage of the Work to be performed (based on the Base Bid) for each Subcontractor that will perform work or service or fabricate or install work for the prime contractor in excess of one-half of 1% of the bid price or, for construction of streets and highways, $10,000 (whichever is greater), using the Subcontractor List form included with the Contract Documents.

10. **Subcontractor Limit.** The prime contractor is required to self-perform at least 33% of the Work on the Project, as further specified in the Instructions to Bidders.

11. **Bidders' Conference.** A bidders' conference will be held on Thursday, January 25, 2018 at 10:00 a.m., at 10555 Mary Ave., Cupertino, CA for the purpose of acquainting all prospective bidders with the Contract Documents and the Worksite. The bidders' conference is not mandatory.

12. **Instructions to Bidders.** All bidders should carefully review the Instructions to Bidders before submitting a Bid Proposal.

By: Grace Schmidt _____ Date: January 4, 2018

Grace Schmidt, City Clerk

Publication Date: In courier on January 12, 2018

END OF NOTICE INVITING BIDS

Instructions to Bidders

Each Bid Proposal submitted to the City of Cupertino ("City") for its **Service Center Shed No. 3 Improvement Project, Project No. 2017-08** ("Project") must be submitted in accordance with the following instructions and requirements:

1. Bid Submission.

1.1 General. The Contract for the Project will be awarded, if at all, to the lowest responsible bidder, as determined by City. Each Bid Proposal must be signed, sealed and submitted to City, using the form provided in the Contract Documents, by or before the date and time set forth in the Notice Inviting Bids, or as amended by subsequent addendum. Faxed or emailed Bid Proposals will not be accepted, unless otherwise specified. Late submissions will be returned unopened. City reserves the right to postpone the date and time for receiving or opening bids. Each bidder is solely responsible for all of its costs to prepare and submit its bid and by submitting a bid waives any right to recover those costs from City. The bid price(s) must include all costs to perform the Work as specified, including all labor, material, supplies, and equipment and all other direct or indirect costs such as applicable taxes, insurance and overhead.

1.2 Bid Envelope. The envelope containing the sealed Bid Proposal and all required forms and attachments must be clearly labeled and addressed as follows:

BID PROPOSAL:
Service Center Shed No. 3 Improvement Project
Project No. 2017-08

City Clerk's Office
Cupertino City Hall
Attn: Ms. Grace Schmidt
10300 Torre Avenue
Cupertino, CA 95014

The envelope must also be clearly labeled, as follows, with the bidder's name, address, for bidding on public works contracts (Labor Code sections 1725.5 and 1771.1):

[Contractor company name]
[street address]
[city, state, zip code]

1.3 DIR Registration. City will not accept a Bid Proposal from or enter into the Contract with a bidder without proof that the bidder is registered with the DIR to perform public work under Labor Code section 1725.5, subject to limited legal exceptions. If City is unable to confirm that the bidder's DIR registration is current at the time of bidding, City must disqualify the bidder and return its bid. (Labor Code section 1725.5.)

2. Bid Proposal Form and Enclosures. Each Bid Proposal must be completed in ink using the Bid Proposal form included in the Contract Documents. The Bid Proposal form must be fully completed without interlineations, alterations, or erasures. Any necessary corrections must be clear and legible, and must be initialed by the bidder's authorized representative. A Bid Proposal submitted with exceptions or terms such as "negotiable," "will negotiate," or similar, will be considered nonresponsive. Each Bid Proposal must be accompanied by bid security, as set forth in Section 4 below, and by a completed Bid Schedule, Subcontractor

List, and Non-Collusion Declaration using the forms included in the Project manual as directed.

3. **Authorization and Execution.** Each Bid Proposal must be signed by the bidder's authorized representative. A Bid Proposal submitted by a partnership must be signed in the partnership name by a general partner with authority to bind the partnership. A Bid Proposal submitted by a corporation must be signed with the legal name of the corporation, followed by the signature and title of two officers of the corporation with full authority to bind the corporation to the terms of the Bid Proposal, under California Corporation Code section 313.

4. **Bid Security.** Each Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's check, certified check, or bid bond using the form included in the Contract Documents and executed by a surety licensed to do business in the State of California, made payable to City. The bid security must guarantee that, within ten days after issuance of the notice of award, the bidder will: execute and submit the enclosed Contract for the bid price; submit payment and performance bonds for 100% of the maximum Contract Price; and submit the insurance certificates and endorsements and any other submittals, if any, required by the Contract Documents or the notice of award.

5. **Bid Schedule.** Each bidder must complete the Bid Schedule form with unit prices as indicated, and submit the completed Bid Schedule with its Bid Proposal.

   5.1 Incorrect Totals. In the event a computational error for any bid item (base bid or alternate) results in an incorrect extended total for that item, the submitted base bid or bid alternate total will be adjusted to reflect the corrected amount (as the product of the estimated quantity and the unit cost), unless the cumulative amount of correction changes the total amount of the base bid or bid alternate. In the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid, and the amount entered as the base bid on the Bid Proposal form, the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid will be deemed the base bid price. Likewise, in the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for any bid alternate, and the amount entered for the alternate on the Bid Proposal form, the actual total of the itemized prices shown on the Bid Schedule for that alternate will be deemed the alternate price. Nothing in this provision is intended to prevent a bidder from requesting to withdraw its bid for material error under Public Contract Code section 5100 et seq.

   5.2 Estimated Quantities. The quantities shown on the Bid Schedule are estimated and the actual quantities required to perform the Work may be greater or less than the estimated amount. The Contract Price will be adjusted to reflect the actual quantities required for the Work based on the itemized or unit prices provided in the Bid Schedule, with no allowance for anticipated profit for quantities that are deleted or decreased, and no increase in the unit price.

6. **Subcontractor Work Limits.** The prime contractor must perform at least the percentage of the Work on the Project specified in the Notice Inviting Bids, which is calculated as a percentage of the base bid price, with its own forces, except for any Work identified as "Specialty Work" in the Bid Schedule. The total bid amount for any such Specialty Work, as shown on the Bid Schedule, may be deducted from the base bid price before computing the percentage the contractor must self-performance. The remaining Work may be performed by qualified Subcontractor(s).

7. Bidder's Questionnaire. A completed, signed Bidder's Questionnaire using the form provided with the Contract Documents and including all required attachments must be submitted within 2 working days following a request by City. A bid submitted by a bidder that does not fully comply with this requirement may be rejected as nonresponsive. A bidder who submits a Bidder's Questionnaire which is subsequently determined to contain false or misleading information, or material omissions, may be disqualified as non-responsible.

8. Pre-Bid Investigation

8.1 General. Each bidder is solely responsible at its sole expense for diligent and thorough review of the Contract Documents and documents provided "For Reference Only," which may include geotechnical reports, as-built or record drawings, utility diagrams, or other such information. Each bidder is also responsible for appropriate examination of the Project site, and reasonable and prudent inquiry concerning known and potential site and area conditions prior to submitting a Bid Proposal. Each bidder is responsible for knowledge of conditions and requirements which reasonable review and investigation would have disclosed. However, except for any areas that are open to the public at large, bidders may not enter City's property or the Project site without prior written authorization from City, and subject to the site investigation requirements set forth below. Bidders are responsible for reporting any errors or omissions in the Contract Documents to City prior to submitting a Bid Proposal, subject to the limitations of Public Contract Code section 1104.

8.2 Project Site. Soil and soil test data, water table elevations, and soil analyses for test holes, if any, may be available for inspection at the City's offices or as otherwise specified in the Contract Documents. Any subsurface exploration at the Project site must be done at the bidder's expense, but only with prior written authorization from City, and as further specified below in subsection 8.4. All soil data and analyses available for inspection or provided in the Contract Documents or in documents provided "For Reference Only," apply only to the test hole locations. Any water table elevation indicated by a soil test report existed on the date the test hole was drilled. The bidder is responsible for determining and allowing for any differing soil or water table conditions during construction. Because groundwater levels may fluctuate, difference(s) in elevation between ground water shown in soil boring logs and ground water actually encountered during Project construction will not be considered changed Project site conditions. Actual locations and depths must be determined by bidder's field investigation. The bidder may request access to underlying or background information on the Project site in City's possession that is necessary for the bidder to form its own conclusions, including, if available, record drawings or other documents indicating the location of subsurface lines, utilities, or other structures. City expressly disclaims responsibility for assumptions a bidder might draw from the presence or absence of information provided by City. City does not warrant the accuracy of any representation of visible, above-ground conditions that may be independently investigated and verified by the bidder. The City disclaims responsibility for the accuracy of information regarding subsurface conditions that has been provided to City by others, such as utility owners.

8.3 Utilities. The Project must be completed in a manner that satisfies the standards and requirements of the affected utility companies or agencies (collectively, "utility owners"). The successful bidder may be required by the utility owners to provide detailed plans prepared by a California registered civil engineer showing the necessary temporary support of the utilities during coordinated construction work. Bidders are directed to contact the utility owners about their requirements before submitting a Bid Proposal.

8.4 Site Investigation Requirements. Potential bidders will be required to execute an agreement to indemnify City and hold it harmless against any liability arising from site

investigation, testing or inspection using City's form Indemnity Agreement (Site Inspection) included with the Project Forms provided with the Contract Documents. The prospective bidder must ensure that any such site investigation is conducted in a manner to avoid endangering persons or damaging property, and must promptly and fully restore the site to its pre-investigation condition, including filling in holes and cleaning up. City reserves the right to impose additional conditions to site access or investigation in order to protect persons or property, including, but not limited to limitations on machinery used during the site investigation.

9. **Bidders Interested in More Than One Bid.** No person, firm, or corporation may submit or be a party to more than one Bid Proposal unless alternate bids are specifically called for. However, a person, firm, or corporation that has submitted a subcontract proposal or quote to a bidder may submit subcontract proposals or quotes to other bidders, and may also submit a Bid Proposal as a prime contractor.

10. **Requests for Information.** Questions or requests for clarifications regarding the Project, the bid procedures, or any of the Contract Documents must be submitted in writing to Alex Acenas, Public Works Project Manager, at alexa@cupertino.org. Oral responses are not authorized and are not binding on the City. Bidders should submit any such written inquiries at least five working days before the scheduled bid opening. Questions received any later might not be addressed before the bid deadline. An interpretation or clarification by City in response to a written inquiry will be issued in an addendum.

11. **Addenda and Plan Holder's List.** Any addenda issued prior to the bid opening are part of the Contract Documents. Subject to the limitations of Public Contract Code section 4104.5, City reserves the right to issue addenda prior to bid time. Addenda will be posted electronically on the City's website at: http://www.cupertino.org/i-want-to/bid-on/open-bids. Notifications will also be transmitted to known plan holders. To be included on the plan holder's list for this Project, email the following information to capitalprojects@cupertino.org: bidder's name, address, phone number and email address, with the Project title included in the subject bar. Each bidder is responsible for ensuring it has received and reviewed all addenda prior to submitting its bid. All bidders, including bidders on the plan holder's list, should regularly check City's website for any addenda or updates on the Project.

12. **Pre-Bid Substitution Requests.** Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate quality and type of item desired, and bidders may request use of any equal material, product, thing, or service. A pre-bid request for substitution must be submitted no later than ten working days before the scheduled bid opening, using the City's Substitution Request Form. All data substantiating the proposed substitute as an equal item must be submitted with the written request for substitution, and all such requests are subject to the requirements and limitations applicable to substitution requests under Section 7.7 of the General Conditions, on Substitutions. These substitution provisions do not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code section 3400(c).

13. **Withdrawal of Bid Proposals.** A Bid Proposal may not be withdrawn for a period of 90 days after the bid opening without forfeiture of the bid security, except as authorized for material error under Public Contract Code section 5100 et seq.

14. **Bid Protest.** Any bid protest must be in writing and received by City at 10300 Torre Ave., Cupertino, CA 95014, Attn: Alex Acenas or via email at alexa@cupertino.org before 5:00 p.m. no later than two Working Days following bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

14.1 Eligibility. Only a bidder who has actually submitted a responsive Bid Proposal, as determined by City, is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. For purposes of this Section, a "Working Day" means a day that City is open for normal business, and excludes weekends and holidays observed by City.

14.2 Protest Contents. The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the protesting bidder and any person representing the protesting bidder.

14.3 Copy to Protested Bidder. Upon submission of its bid protest to City, the protesting bidder must also concurrently transmit the protest and all supporting documents to the protested bidder, and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest, by email or hand delivery to ensure delivery before the Bid Protest Deadline.

14.4 Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., within two Working Days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder if different from the protested bidder.

14.5 Copy to Protesting Bidder. Upon submission of its response to the bid protest to the City, the protested bidder must also concurrently transmit by email or hand delivery, by or before the Response Deadline, a copy of its response and all supporting documents to the protesting bidder and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

14.6 Exclusive Remedy. The procedure and time limits set forth in this section are mandatory and are the bidder's sole and exclusive remedy in the event of a bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

14.7 Right to Award. City reserves the right, acting in its sole discretion, to reject any bid protest that it determines lacks merit, to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.

15. Reservation of Rights. To the full extent permitted by law, City reserves the right, acting in its sole discretion, to waive or to decline to waive any immaterial bid irregularities, to accept or reject any and all bids, or to abandon the Project entirely. The Contract will be awarded, if at all, within 90 days after opening of bids or as otherwise specified in the Special Conditions, to the responsible bidder that submitted the lowest responsive bid. Any date given for planned commencement of the Project given in Section 2.2 of the Notice Inviting Bids is provided as informative of City's expectations at the time the Notice Inviting Bids was first issued. City is not bound to issue a Notice to Proceed by or before such

planned commencement date, and reserves the right to issue the Notice to Proceed when the City determines, in its sole discretion, the appropriate time for commencing the Work.

16. **Bonds.** The successful bidder is required to submit payment and performance bonds as specified in the Contract Documents using the bond forms included in the Contract Documents, within ten days following City's issuance of the notice of award. All required bonds must be calculated on the maximum total Contract Price as awarded, including additive alternates, if applicable.

17. **License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work, and must also obtain a City Business License before beginning Work on the Project, unless its sole business contact within the City is the sale of goods or services to the City itself.

18. **Ineligible Subcontractor.** Any Subcontractor who is ineligible to perform work on a public works project under Labor Code sections 1777.1 or 1777.7 is prohibited from performing work on the Project.

19. **Safety Orders.** If the Project includes construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet or deeper, each bid must include a bid item for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which comply with safety orders as required by Labor Code section 6707.

END OF INSTRUCTIONS TO BIDDERS

Bid Proposal

Service Center Shed No. 3 Improvement Project

_____ ("Bidder") hereby submits this Bid Proposal to the City of Cupertino ("City") for the above-referenced project ("Project") in response to the Notice Inviting Bids and in accordance with the Contract Documents referenced therein.

1. Base Bid. Bidder proposes to perform and fully complete the Work for the Project as specified in the Contract Documents, within the time required for full completion of the Work, including all labor, materials, supplies, and equipment and all other direct or indirect costs including, but not limited to, taxes, insurance and all overhead for the following price ("Base Bid"):

$ _____.

2. Addenda. Bidder agrees that it has confirmed receipt of or access to, and reviewed, all addenda issued for this Bid. Bidder specifically acknowledges receipt of the following addenda:

Addendum:	Date Received:	Addendum:	Date Received:
#01	_____	#05	_____
#02	_____	#06	_____
#03	_____	#07	_____
#04	_____	#08	_____

3. Bidder's Warranties. By signing and submitting this Bid Proposal, Bidder warrants the following:

3.1 Examination of Contract Documents. Bidder has thoroughly examined the Contract Documents and represents that, to the best of Bidder's knowledge, there are no errors, omissions, or discrepancies in the Contract Documents, subject to the limitations of Public Contract Code section 1104.

3.2 Examination of Worksite. Bidder has had the opportunity to examine the Worksite and local conditions at the Project location.

3.3 Bidder is Qualified. Bidder is fully qualified to perform the Work.

3.4 Responsibility for Bid. Bidder has carefully reviewed this Bid Proposal and is solely responsible for any errors or omissions contained in its completed Bid.

4. Award of Contract. By signing and submitting this Bid Proposal, Bidder agrees that if Bidder is awarded the Contract for the Project, within ten days following issuance of the notice of award to Bidder, Bidder will do all of the following:

4.1 Execute Contract. Enter into the Contract with City in accordance with the terms of this Bid Proposal, by signing and submitting to City the Contract prepared by City using the form included with the Contract Documents;

4.2 Submit Required Bonds. Submit to City a payment bond and a performance bond, each for 100% of the Contract Price, using the bond forms provided and in accordance with the requirements of the Contract Documents; and

4.3 Insurance Requirements. Submit to City the insurance certificate(s) and endorsement(s) as required by the Contract Documents.

5. Bid Security. As a guarantee that, if awarded the Contract, Bidder will perform its obligations under Section 4 above, Bidder is enclosing bid security in the amount of ten percent of its maximum bid amount in one of the following forms (check one):

____ A cashier's check or certified check payable to City and issued by

_____ [Bank name] in the amount of

$_____.

____ A bid bond, using the Bid Bond form included with the Contract Documents, payable to City and executed by a surety licensed to do business in the State of California.

This Bid Proposal is hereby submitted on _____, 20__.

_____ Bidder Business Name	_____ Date
_____ Signature	_____ Signature
_____ Name/Title (If Corporation: Chairman, President or Vice President)	_____ Name/Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)
_____ License #, Expiration Date, and Classification	_____ DIR Registration #
_____ Address	_____ Phone
_____ City, State, Zip	_____ Contact Name/Title
_____ Contact Phone	_____ Contact Email

END OF BID PROPOSAL

Bid Schedule

This Bid Schedule must be completed in ink and included with the sealed Bid Proposal. Pricing must be provided for each Bid Item as indicated. Items marked "(SW)" are Specialty Work that must be performed by a qualified Subcontractor. The lump sum or unit cost for each item must be inclusive of all costs, whether direct or indirect, including profit and overhead. The sum of all amounts entered in the "Extended Total Amount" column must be identical to the Base Bid price entered in Section 1 of the Bid Proposal Form.

LS = Lump Sum EA = Each LF = Linear Foot CY = Cubic Yard SY=Square Yard
SF = Square Feet LB = Pounds TON = Ton (2000 lbs) AL = Allowance

BID ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	EXTENDED TOTAL AMOUNT
1	Service Center Shed No. 3 Improvement Project	1	1	$	$

TOTAL BASE BID: $_____

Note: The amount entered as the "Total Base Bid" should be identical to the Base Bid amount entered in Section 1 of the Bid Proposal form.

BIDDER NAME: _____

END OF BID SCHEDULE

Subcontractor List

For each Subcontractor that will perform a portion of the Work in an amount in excess of one-half of 1% of the Bidder's total Contract Price,[1] the bidder must list a description of the Work, the name of the Subcontractor, its California contractor license number, the location of its place of business, its DIR registration number, and the portion of the Work that the Subcontractor is performing based on a percentage of the Base Bid price. Bidder may not list more than one Subcontractor for each such portion of the Work listed by Bidder below.

DESCRIPTION OF WORK	SUBCONTRACTOR NAME	CALIFORNIA CONTRACTOR LICENSE NO.	LOCATION OF BUSINESS	DIR REG. NO.	PERCENT OF WORK

END OF SUBCONTRACTOR LIST

[1] For street or highway construction this requirement applies to any subcontract of $10,000 or more.

Noncollusion Declaration

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ [title] of _____ [business name], the party making the foregoing bid.

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

This declaration is intended to comply with California Public Contract Code section 7106 and Title 23 U.S.C section 112.

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

s/_____

_____
Name [print]

END OF NONCOLLUSION DECLARATION

Bid Bond

_____ ("Bidder") has submitted a bid, dated _____, 20_____ ("Bid"), to City of Cupertino ("City") for work on the **Service Center Shed No. 3 Improvement Project** ("Project"). Under this duly executed bid bond ("Bid Bond"), Bidder as Principal and _____, its surety ("Surety"), are bound to City as obligee in the penal sum of ten percent of the maximum amount of the Bid (the "Bond Sum"). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

1. **General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with City in accordance with the terms of the Bid.

2. **Submittals.** Within ten days following issuance of the Notice of Award to Bidder, Bidder must submit to City the following:

2.1 **Contract.** The executed Contract, using the form provided by City in the Project contract documents ("Contract Documents");

2.2 **Payment Bond.** A payment bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond form included with the Contract Documents;

2.3 **Performance Bond.** A performance bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Performance Bond form included with the Contract Documents; and

2.4 **Insurance.** The insurance certificate(s) and endorsement(s) required by the Contract Documents, and any other documents required under the Instructions for Bidders.

3. **Enforcement.** If Bidder fails to execute the Contract and to submit the bonds and insurance certificates as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to City. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

4. **Duration; Waiver.** If Bidder fulfills its obligations under Section 2, above, then this obligation will be null and void; otherwise it will remain in full force and effect for 90 days following award of the Contract or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code sections 2819 and 2845.

[Signatures are on the following page.]

This Bid Bond is entered into and effective on _____, 20_____.

SURETY: _____
Business name

s/_____

_____
Name/Title

(Acknowledgement with Notary Seal for Surety, and Surety's Power of Attorney-In-Fact Certificate must be attached.)

BIDDER: _____
Business name

s/_____

_____
Name/Title

END OF BID BOND

Bidder's Questionnaire

SERVICE CENTER SHED NO. 3 IMPROVEMENT PROJECT

Within 2 working days following a request by the City of Cupertino ("City"), a bidder must submit to City a completed, signed Bidder's Questionnaire using this form and including all required attachments. City may request the Questionnaire from one or more of the apparent low bidders following the bid opening, and may use the completed Questionnaire to evaluate a bidder's qualifications for this Project. The Questionnaire must be filled out completely, accurately, and legibly. Any errors, omissions, or misrepresentations in completion of the Questionnaire may be grounds for rejection of the bid or termination of a Contract awarded pursuant to the bid.

Part 1: General Information

Bidder's Full Legal (Business) Name: _____
("Bidder")

Check One: ___ Corporation
___ Partnership
___ Sole Proprietorship
___ Joint Venture of: _____ *
___ Other:_____

Address: _____

_____

Phone: _____

Owner of Business: _____

Contact Person: _____

Email: _____

Bidder's California Contractor's License Number(s): _____

Bidder's Federal I.D. Number: _____

* *If Bidder is a joint venture identify each member and the role of each member of the joint venture, and provide a completed Bidder's Questionnaire for each member of the joint venture.*

Part 2: Bidder Experience

1. How many years has Bidder been in business under its present business name? ____ years

2. Has Bidder completed projects similar in type and size to this Project as a general contractor?
_____ Yes _____ No

3. Has Bidder ever been disqualified on grounds that it is not responsible?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding the disqualification, including the name and address of the agency or owner of the subject project, the type and size

of the project, the reasons that Bidder was disqualified as not responsible, and the month and year in which the disqualification occurred.

4. Has Bidder ever been terminated from a construction project, either as a general contractor or as a subcontractor?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding the termination, including the name and address of the agency or owner of the subject project, the type and size of the project, whether Bidder was under contract as a general contractor or a subcontractor, the reasons that Bidder was terminated, and the month and year in which the termination occurred.

5. Has Bidder's contractor's license(s) ever been revoked?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding each revocation, including the license classification and license number, the reason(s) the license was revoked, the date of revocation, and the date of reinstatement.

6. Has Bidder ever been fined or disbarred for failure to comply with state or federal prevailing wage requirements?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding each fine or disbarment, including the reason(s) for the fine or disbarment, the agency that imposed the fine or disbarment, the date(s) of the fine or disbarment, and identify the project and project owner for which the Bidder was determined to be non-compliant with prevailing wage requirements.

7. Has Bidder ever been subject to civil or criminal penalties or other adverse action for violation(s) of health, safety or environmental laws or regulations?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding each such violation, including the reason(s) for the determination against Bidder, the agency that determined Bidder to be in violation, the nature and date(s) of such penalty or other adverse action, and identify the project and project owner for which the Bidder was determined to be in violation of health, safety or environmental laws or regulations.

8. Has Bidder ever been fined or convicted for unlawful labor practices, including, but not limited to, employment of undocumented workers?
_____ Yes _____ No

If yes, provide additional information on a separate sheet of paper regarding each such fine or conviction, including the nature and date(s) of the violation(s), the agency that determined Bidder to be in violation, and identify the project and project owner in relation to which the Bidder was fined or convicted of unlawful labor practices.

9. Provide information about Bidder's past projects performed as general contractor as follows:

9.1 Four most recently completed public works projects within the last three years;

9.2 Three largest completed projects within the last three years; and

9.3 At least three projects which are similar to this Project including magnitude and character of the work.

10. Use separate sheets of paper to provide all of the following information for each project identified in response to the above three categories, under section 10:

10.1 Project name
10.2 Location
10.3 Owner
10.4 Owner contact (name and current phone number)
10.5 Architect or engineer name
10.6 Architect or engineer contact (name and current phone number)
10.7 Project manager (name and current phone number)
10.8 Description of project and scope of work performed by bidder, more particularly be specific as to what applies a similar character of work to this project
10.9 Initial contract value (at time of bid award)
10.10 Final cost of construction (including change orders)
10.11 Original scheduled completion date
10.12 Time extensions granted (number of days)
10.13 Actual date of completion
10.14 Number and amount of stop notices or mechanic's liens filed
10.15 Amount of liquidated damages assessed against Bidder
10.16 Nature and resolution of any claim, lawsuit, and/or arbitration between Bidder and the owner.

Part 3: Bonds and Insurance

1. Bidder's current bonding capacity is: $_____.

2. Provide the following information regarding Bidder's bond surety and bond agent:

Surety's Name: _____
NAIC#: _____
Address: _____
Phone: _____
Surety's A.M. Best Ratings for financial size and strength: _____
Is surety an admitted surety in California? _____ Yes _____ No

Bond agent name, address and phone:
_____
_____
Percentage rate paid for payment, performance and warranty bonds: ___%

3. Provide the following information regarding Bidder's insurance policies and insurers:

Commercial General Liability:
Insurer name, address and phone: _____
_____
NAIC#: _____
Insurer A.M. Best's rating for financial size and financial strength: _____
Policy number and expiration date: _____
Coverage limits: $_____ per occurrence, and $_____ aggregate

Automobile Liability:
Insurer name, address and phone: _____
_____
NAIC#: _____
Insurer A.M. Best's rating for financial size and financial strength: _____
Policy number and expiration date: _____
Coverage limits: $_____ per occurrence, and $_____ aggregate

Workers' Compensation:
Insurer name, address and phone: _____
_____
NAIC#: _____
Insurer A.M. Best's rating for financial size and financial strength: _____
Policy number and expiration date: _____
Coverage limits: $_____ per occurrence, and $_____ aggregate

Excess or Umbrella Liability:
Insurer name, address and phone: _____
_____
NAIC#: _____
Insurer A.M. Best's rating for financial size and financial strength: _____
Policy number and expiration date: _____
Coverage limits: $_____ per occurrence, and $_____ aggregate

Part 4: Verification

In signing this document, I, the undersigned, declare that I am duly authorized to sign and submit this Bidder's Questionnaire on behalf of the named Bidder, and that all responses and information set forth in this Bidder's Questionnaire and accompanying attachments are, to the best of my knowledge, true, accurate and complete as of the date of submission. City is hereby authorized to obtain a credit report(s) or conduct additional investigation to verify the information provided above or additional information that City deems relevant to its determination of whether Bidder is a "responsible bidder," as that term is defined in Public Contract Code section 1103. **I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.**

Signature: _____ Date: _____

By: _____
Name and Title

END OF BIDDER'S QUESTIONNAIRE

Contract

This public works contract ("Contract") is entered into by and between the City of Cupertino ("City"), a municipal corporation, and _____ ("Contractor"), for work on the **Service Center Shed No. 3 Improvement Project** ("Project").

The parties agree as follows:

1. **Award of Contract**. In response to the Notice Inviting Bids, Contractor has submitted a Bid Proposal and accompanying Bid Schedule, a copy of which is attached for convenience as Exhibit A, to perform the Work to construct the Project. On _____, 20___, City authorized award of this Contract to Contractor for the amount of Contractor's bid.

2. **Contract Documents**. The Contract Documents incorporated into this Contract include and are comprised of all of the following:

2.1 Notice Inviting Bids;
2.2 Instructions to Bidders;
2.3 Addenda, if any;
2.4 Bid Proposal and attachments thereto;
2.5 Contract;
2.6 Payment Bond, Performance Bond and, if required, a Warranty Bond;
2.7 General Conditions;
2.8 Special Conditions;
2.9 Project Drawings and Specifications;
2.10 Change Orders, if any;
2.11 Notice of Award;
2.12 Notice to Proceed;
2.13 The following:

_____
_____. <List additional documents here, if any, including the document date if there are multiple versions. If there are no additional documents, write "No other documents" in the space above.>

3. **Contractor's Obligations.** Contractor agrees to perform all of the Work required for the Project, as specified in the Contract Documents. Contractor must provide, furnish, and supply all things necessary and incidental for the timely performance and completion of the Work, including all necessary labor, materials, supplies, tools, equipment, transportation, and utilities, unless otherwise specified in the Contract Documents. Contractor must use its best efforts to complete the Work in a professional and expeditious manner and to meet or exceed the performance standards required by the Contract Documents.

4. **Payment.** As full and complete compensation for Contractor's timely performance and completion of the Work in strict accordance with the terms and conditions of the Contract Documents, City will pay Contractor $_____ (the "Contract Price") for all of Contractor's direct and indirect costs to perform the Work, including all labor, materials, supplies, equipment, taxes, insurance, bonds and all overhead costs, in accordance with the payment provisions in the General Conditions.

5. **Time for Completion.** Contractor will fully complete the Work for the Project within 180 calendar days from the commencement date given in the Notice to Proceed ("Contract Time"). By signing below, Contractor expressly waives any claim for delayed early completion.

6. **Liquidated Damages.** If Contractor fails to complete the Work within the Contract Time, City will assess liquidated damages in the amount of $ 1,000 per day for each day of unexcused delay in completion, and such liquidated damages may be deducted from City's payments due or to become due to Contractor under this Contract.

7. **Labor Code Compliance.**

   7.1 **General.** This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours and workers' compensation insurance.

   7.2 **Prevailing Wages.** This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available online at http://www.dir.ca.gov/DLSR.

   7.3 **DIR Registration.** City will not enter into the Contract with a bidder without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations to perform public work under Labor Code section 1725.5, subject to limited legal exceptions.

8. **Workers' Compensation Certification.** Under Labor Code section 1861, by signing this Contract, Contractor certifies as follows: "I am aware of the provisions of Labor Code section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work on this Contract."

9. **Conflicts of Interest.** Contractor, its employees, Subcontractors and agents, may not have, maintain or acquire a conflict of interest in relation to this Contract in violation of any City ordinance or policy or in violation of any California law, including under Government Code section 1090 et seq. and under the Political Reform Act as set forth in Government Code section 81000 et seq. and its accompanying regulations. No officer, official, employee, consultant, or other agent of the City ("City Representative") may have, maintain, or acquire a "financial interest" in the Contract, as that term is defined under the Political Reform Act (Government Code section 81000, et seq., and regulations promulgated thereunder); or under Government Code section 1090, et seq.; or in violation of any City ordinance or policy while serving as a City Representative or for one year thereafter. Any violation of this Section constitutes a material breach of the Contract.

10. **Independent Contractor.** Contractor is an independent contractor under this Contract and will have control of the Work and the means and methods by which it is performed. Contractor and its Subcontractors are not employees of City and are not entitled to participate in any health, retirement, or any other employee benefits from City.

11. **Notice.** Any notice, billing, or payment required by or pursuant to the Contract Documents must be made in writing, signed, dated and sent to the other party by personal delivery, U.S. Mail, a reliable overnight delivery service, or by email as a PDF (or comparable) file. Notice is deemed effective upon delivery unless otherwise specified. Notice for each party must be given as follows:

City:

Name: City of Cupertino
Address: 10300 Torre Avenue
City/State/Zip: Cupertino, CA 95014
Phone: (408) 777-3354
Attn: Alex Acenas
Email: alexa@cupertino.org
Copy to: <_____>

Contractor:

Name:_____
Address:_____
City/State/Zip:_____
Phone:_____
Attn:_____
Email:_____
Copy to:_____

12. General Provisions.

12.1 Assignment and Successors. Contractor may not assign its rights or obligations under this Contract, in part or in whole, without City's written consent. This Contract is binding on Contractor's and City's lawful heirs, successors and permitted assigns.

12.2 Third Party Beneficiaries. There are no intended third party beneficiaries to this Contract except as expressly provided in the General Conditions or Special Conditions.

12.3 Governing Law and Venue. This Contract will be governed by California law and venue will be in the Superior Court of Santa Clara County, and no other place.

12.4 Amendment. No amendment or modification of this Contract will be binding unless it is in a writing duly authorized and signed by the parties to this Contract.

12.5 Integration; Severability. This Contract and the Contract Documents incorporated herein, including authorized amendments or Change Orders thereto, constitute the final, complete, and exclusive terms of the agreement between City and Contractor. If any provision of the Contract Documents, or portion of a provision, is determined to be illegal, invalid, or unenforceable, the remaining provisions of the Contract Documents will remain in full force and effect.

12.6 Authorization. Each individual signing below warrants that he or she is authorized to do so by the party that he or she represents, and that this Contract is legally binding on that party. If Contractor is a corporation, signatures from two officers of the corporation are required pursuant to California Corporation Code section 313.

[Signatures are on the following page.]

The parties agree to this Contract as witnessed by the signatures below:

CONTRACTOR

_____
<insert full name of Contractor above>

By_____
Name_____
Title_____
Date_____

By
Name_____
Title
Date_____

CITY OF CUPERTINO
A Municipal Corporation

By_____
David Brandt
City Manager
Date_____

APPROVED AS TO FORM:

By _____
Name_____
City Attorney
Date_____

ATTEST:

_____
Grace Schmidt
City Clerk
Date_____

Contract Amount: _____
P.O. No. _____
Account No. _____

END OF CONTRACT

Payment Bond

The City of Cupertino ("City") and _____ ("Contractor") have entered into a contract, dated _____, 20___ ("Contract") for work on the **Service Center Shed No. 3 Improvement Project** ("Project"). The Contract is incorporated by reference into this Payment Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____, its surety ("Surety"), are bound to City as obligee in an amount not less than $_____, under California Civil Code sections 9550, et seq.

2. **Surety's Obligation.** If Contractor or any of its Subcontractors fails to pay any of the persons named in California Civil Code section 9100 amounts due under the 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 Employment Development Department from the wages of employees of Contractor and its Subcontractors, under California Unemployment Insurance Code section 13020, with respect to the work and labor, then Surety will pay for the same.

3. **Beneficiaries.** This Bond inures to the benefit of any of the persons named in California Civil Code section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon this Bond. Contractor must promptly provide a copy of this Bond upon request by any person with legal rights under this Bond.

4. **Duration.** If Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the Work required by the Contract, in conformance with the time requirements set forth in the Contract and as required by California law, Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.

5. **Waivers.** Surety waives any requirement to be notified of alterations to the Contract or extensions of time for performance of the Work under the Contract. Surety waives the provisions of Civil Code sections 2819 and 2845. City waives requirement of a new bond for any supplemental contract under Civil Code section 9550. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____
   Fax: _____
   Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court of Santa Clara County in which the Project is located, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

7. Effective Date; Execution. This Bond is entered into and is effective on _____, 20__.

SURETY: _____
Business Name

s/ _____

_____
Name/Title

(Acknowledgment with Surety's Notary Seal and Surety's Power of Attorney must be attached.)

CONTRACTOR: _____
Business Name

s/ _____

_____
Name/Title

s/ _____

_____
Name/Title

END OF PAYMENT BOND

Performance Bond

The City of Cupertino ("City") and _____ ("Contractor") have entered into a contract, dated _____, 20____ ("Contract") for work on the **Service Center Shed No. 3 Improvement Project** ("Project"). The Contract is incorporated by reference into this Performance Bond ("Bond").

1. **General.** Under this Bond, Contractor as Principal and _____, its surety ("Surety"), are bound to City as obligee for an amount not less than $_____. By executing this Bond, Contractor and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, to the provisions of this Bond.

2. **Surety's Obligations; Waiver.** If Contractor fully performs its obligations under the Contract, including its warranty obligations under the Contract, Surety's obligations under this Bond will become null and void upon recordation of the notice of completion, provided Contractor has timely provided a warranty bond as required under the Contract. Surety waives any requirement to be notified of and further consents to any alterations to the Contract made under the applicable provisions of the Contract Documents, including changes to the scope of Work or extensions of time for performance of Work under the Contract. Surety waives the provisions of Civil Code sections 2819 and 2845.

3. **Application of Contract Balance.** Upon making a demand on this Bond, City will make the Contract Balance available to Surety for completion of the Work under the Contract. For purposes of this provision, the Contract Balance is defined as the total amount payable by City to Contractor as the Contract Price minus amounts already paid to Contractor, and minus any liquidated damages, credits, or backcharges to which City is entitled under the terms of the Contract.

4. **Contractor Default.** Upon written notification from City that Contractor is in default under Article 13 of the Contract General Conditions, time being of the essence, Surety must act within the time specified in Article 13 to remedy the default through one of the following courses of action:

4.1 Arrange for completion of the Work under the Contract by Contractor, with City's consent, but only if Contractor is in default solely due to its financial inability to complete the Work;

4.2 Arrange for completion of the Work under the Contract by a qualified contractor acceptable to City, and secured by performance and payment bonds issued by an admitted surety as required by the Contract Documents, at Surety's expense; or

4.3 Waive its right to complete the Work under the Contract and reimburse City the amount of City's costs to have the remaining Work completed.

5. **Surety Default.** If Surety defaults on its obligations under the Bond, City will be entitled to recover all costs it incurs due to Surety's default, including legal, design professional, or delay costs.

6. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____

City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

7. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court for Santa Clara County in which the Project is located, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

8. **Effective Date; Execution.** This Bond is entered into and effective on _____, 20___.

SURETY: _____
Business Name

s/ _____

_____
Name/Title [print]

(Acknowledgment with Notary Seal for Surety and Surety's Power of Attorney must be attached.)

CONTRACTOR: _____
Business Name

s/ _____

_____
Name/Title

s/ _____

_____
Name/Title

END OF PERFORMANCE BOND

General Conditions

Article 1 – Definitions

Definitions. The following definitions apply to all of the Contract Documents unless otherwise indicated. Defined terms and titles of documents are capitalized in the Contract Documents, with the exception of the following (in any tense or form): “day,” “furnish,” “including,” “install,” “work day” or “working day.”

Allowance means a specific amount that must be included in the Bid Proposal for a specified purpose.

Article, as used in these General Conditions, means a numbered Article of the General Conditions, unless otherwise indicated by the context.

Change Order means a written document duly approved and executed by City, which changes the scope of Work, the Contract Price, or the Contract Time.

City means the City of Cupertino, acting through its City Council, officers, employees, City Engineer, and any other authorized representatives.

City Engineer means the City Engineer for City and his or her authorized delegee(s).

Claim means a separate demand by Contractor for a change in the Contract Time or Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected by City, in whole or in part; or a written demand by Contractor objecting to the amount of Final Payment.

Contract means the signed agreement between City and Contractor.

Contract Documents means, collectively, all of the documents listed as such in Section 2 of the Contract, including the Notice Inviting Bids; the Instructions to Bidders; addenda, if any; the Bid Proposal, and attachments thereto; the Contract; the notice of award and notice to proceed; the payment, performance and warranty bonds; the General Conditions; the Special Conditions; the Project Drawings and Specifications; any Change Orders; and any other documents expressly made part of the Contract Documents.

Contract Price means the total compensation to be paid to Contractor for performance of the Work, as set forth in the Contract and as amended by Change Order or adjusted for an Allowance. The Contract Price is not subject to adjustment due to inflation or due to the increased cost of labor, material, supplies or equipment following submission of the Bid Proposal.

Contract Time means the time specified for complete performance of the Work, as set forth in the Contract and as may be amended by Change Order.

Contractor means the individual, partnership, corporation, or joint-venture that has signed the Contract with City to perform the Work.

Day means a calendar day unless otherwise specified.

Design Professional means the licensed individual(s) or firm(s) retained by City to provide architectural or engineering services for the Project. If no Design Professional has been retained for this Project, any reference to Design Professional is deemed to refer to the Engineer.

DIR means the California Department of Industrial Relations.

Drawings means the City-provided plans and graphical depictions of the Project requirements, and does not include Shop Drawings.

Engineer means the City Engineer for the City of Cupertino and his or her authorized delegees.

Extra Work means new or unforeseen work added to the Project, as determined by the Engineer in his or her sole discretion, including Work that was not part of or incidental to the scope of the Work when the Contractor's bid was submitted; is substantially different from the Work as described in the Contract Documents at bid time; or Work that results from a substantially differing and unforeseeable condition.

Final Completion means Contractor has fully completed all of the Work required by the Contract Documents, including all punch list items, any required commissioning or training, and has provided all required submittals, including the warranty bond, instructions and manuals, product warranties and as-built drawings to City's satisfaction.

Final Payment means payment to Contractor of the unpaid Contract Price, including release of undisputed retention, less amounts withheld pursuant to the Contract Documents, including liquidated damages, up to 125% of the amount of any unreleased stop notice, amounts subject to setoff, up to 150% of any unresolved third-party claim for which Contractor is required to indemnify City, and up to 150% of any amount in dispute as authorized by Public Contract Code section 7107.

Furnish means to purchase and deliver to the Worksite designated for installation.

Hazardous Materials means any substance or material identified now or in the future as hazardous under any federal, state, or local law or regulation, or any other substance or material that may be considered hazardous or otherwise subject to statutory or regulatory requirements governing handling, disposal, or cleanup.

Including, whether or not capitalized, means "including, but not limited to," unless the context clearly requires otherwise.

Inspector means the individual(s) or firm(s) retained or employed by City to inspect the workmanship, materials, and manner of construction of the Project and its components to ensure compliance with the Contract Documents and all applicable codes, regulations, and permits.

Install means to fix in place for materials, and to fix in place and connect for equipment.

Plans has the same meaning as Drawings.

Project means the public works project referenced in the Contract.

Project Manager means the individual designated by City to oversee and manage the Project on City's behalf and may include his or her authorized delegee(s) when the Project Manager is unavailable. If no Project Manager has been designated for this Project, any reference to Project Manager is deemed to refer to the Engineer.

Request for Information or RFI means Contractor's written request for information submitted to City, in the manner and format specified by City, about the Contract Documents, the Work or the Project.

Section as used in these General Conditions, means a numbered Section of the General Conditions, unless otherwise indicated by the context, e.g., statutory references.

Shop Drawings means drawings, plan details or other graphical depictions prepared by or on behalf of Contractor, and subject to City acceptance, which are intended to provide details for fabrication, installation, and the like, of items required by or shown in the Drawings and Specifications.

Specialty Work means Work that must be performed by a specialized Subcontractor with the specified license or other special certification, and not by the Contractor.

Specifications means the technical, text specifications describing the Project requirements, which are prepared for and incorporated into this Project by or on behalf of City, and does not include the Contract, General Conditions or Special Conditions.

Subcontractor means an individual, partnership, corporation, or joint-venture retained by Contractor directly or indirectly through a subcontract to perform a specific portion of the Work. The term Subcontractor applies to subcontractors, suppliers, fabricators, and equipment lessors of all tiers, unless otherwise indicated by the context.

Technical Specifications means Specifications.

Work means all of the construction and services necessary for or incidental to completing the Project in conformance with the requirements of the Contract Documents.

Work Day or Working Day, whether or not capitalized, means a weekday when the City is open for business, and does not include holidays observed by the City or furlough days when City staff is unavailable.

Worksite means the place or places where the Work is performed, which includes, but may extend beyond the Project site, including separate locations for staging or fabrication.

Article 2 - Roles and Responsibilities

2.1 City.

(A) ***City Council.*** The City Council has final authority in all matters affecting the Project, except to the extent it has delegated such authority to the Engineer.

(B) ***Engineer.*** The Engineer, acting within the authority conferred by the City Council, has primary responsibility for administration of the Project on behalf of City, including authority to provide directions to the Design Professional and to Contractor to ensure proper and timely completion of the Project. The Engineer's decisions are final and conclusive within the scope of his or her authority, including interpretation of the Contract Documents.

(C) ***Design Professional.*** The Design Professional is responsible for the overall design of the Project and, to the extent authorized by City, may act on City's behalf to ensure performance of the Work in compliance with the Contract Documents. The Design Professional's interpretation of the Drawings or Specifications is final and conclusive.

2.2 Contractor.

(A) ***General.*** Contractor must provide all labor, materials, supplies equipment and services and incidentals necessary to perform and timely complete the Work in strict accordance with the Contract Documents, and in an economic and efficient manner in the best interests of City, and with minimal inconvenience to the public.

(B) ***Responsibility for the Work and Risk of Loss.*** Contractor is responsible for supervising and directing all aspects of the Work to facilitate the efficient and timely completion of the Work. Contractor is solely responsible for and required to exercise full control over the Work, including the construction means, methods, techniques, sequences, procedures, and coordination of all portions of the Work with that of all other contractors and Subcontractors, except to the extent that the Contract Documents provide other specific instructions. Contractor's responsibilities extend to any plan, method or sequence suggested, but not required by City or specified in the Contract Documents. From the date of commencement of the Work until either the date on which City formally accepts the Project or the effective date of termination of the Contract, whichever is later, Contractor bears all risks of injury or damage to the Work and the materials and equipment delivered to the Work site, by any cause including fire, earthquake, wind, weather, vandalism or theft.

(C) ***Project Administration.*** Contractor must provide sufficient and competent administration, staff, and skilled workforce necessary to perform and timely complete the Work in accordance with the Contract Documents. Before starting the Work, Contractor must designate in writing and provide complete contact information, including telephone numbers and email address, for the officer or employee in Contractor's organization who is to serve as Contractor's primary representative for the Project, and who has authority to act on Contractor's behalf. A Subcontractor may not serve as Contractor's primary representative.

(D) ***On-Site Superintendent.*** Contractor must, at all times during performance of the Work, provide a qualified and competent full-time superintendent acceptable to City, and assistants as necessary, who must be physically present at the Project site while any aspect of the Work is being performed. City's approval of the superintendent is required before the Work commences. If City is not satisfied with the superintendent's performance, City may request a qualified replacement of the superintendent. Failure to comply may result in temporary suspension of the Work, at Contractor's sole expense and with no extension of Contract Time, until the approved superintendent is physically present to supervise the Work. Contractor must provide written notice to City, as soon as practicable, before replacing the superintendent.

(E) ***Standards; Compliance.*** Contractor must, at all times, ensure that the Work is performed in a good, workmanlike manner following best practices and in full compliance with the Contract Documents and all applicable laws, regulations, codes, standards, and permits, including City's municipal code, rules, and regulations, and any orders of the administrative or judicial bodies with jurisdiction over the Work.

(F) ***Meetings.*** Contractor, its superintendent, and its major Subcontractors and suppliers will be required to attend a Preconstruction Conference before beginning Work on the Project, and will also be required to attend regular progress meetings, as further specified below. City will notify Contractor in advance of the date, time, place and required attendees for the Preconstruction Conference and progress meetings and will provide and administer the agenda. Contractor is responsible for notifying its major Subcontractors and suppliers, and other required attendees, as applicable, of the date, time and place for the Preconstruction Conference and progress meetings; for providing them with the City's agenda; and for requiring their attendance at these meetings.

(1) *Preconstruction Conference*. The Preconstruction Conference agenda items may include schedules, personnel and vehicle permit procedures, use of the premises, locations for staging area(s) and jobsite trailers, security, housekeeping, submittal and RFI procedures, Project forms and procedures, inspection and testing procedures, utility shutdown procedures, control and

reference point procedures, injury and illness prevention program, Contractor's schedule of values, Contractor's schedule of submittals, and such other matters that the City deems necessary to address before the Work begins.

(2) *Progress Meetings.* During the course of the Project, progress meetings will be conducted on a weekly basis by the City and at Contractor's on-site office, unless otherwise specified. Progress meeting agenda items may include review of past meeting minutes, review of Work in progress since previous progress meeting, schedule status and updates, status of submittals or change orders, worker safety, and other such matters pertaining to the progress of the Work.

(G) ***Responsible Party.*** Contractor is solely responsible to City for the acts or omissions of any Subcontractor(s), or any other party or parties performing portions of the Work or providing equipment, materials or services for or on behalf of Contractor or the Subcontractors. Upon City's written request, Contractor must promptly and permanently remove from the Project, at no cost to City, any employee or Subcontractor or employee of a Subcontractor who the Engineer has determined to be incompetent, intemperate or disorderly, or who has failed or refused to perform the Work as required under the Contract Documents.

(H) ***Correction of Defects.*** Contractor must promptly correct, at Contractor's sole expense, any Work that is determined by City to be deficient or defective in any way, including workmanship, materials, parts or equipment. Workmanship, materials or equipment that do not conform to the requirements under the Drawings, Specifications and every other Contract Document, as determined by City, will be considered defective and subject to rejection. Contractor must also promptly correct, at Contractor's sole expense, any Work performed beyond the lines and grades shown on the Plans or established by City, and any Extra Work performed without City's prior written approval. However, City retains the right, but not the obligation, to retain defective Work, and deduct the difference in value, as determined by the Engineer, from payments otherwise due to Contractor.

(I) ***Contractor's Records.*** Contractor must maintain all of its records relating to the Project in any form, including paper documents, photos, videos and electronic records. Project records subject to this provision include, but are not limited to, Project cost records and records relating to preparation of Contractor's bid.

(1) Contractor's cost records must include all supporting documentation, including original receipts, invoices, and payroll records, evidencing its direct costs to perform the Work, including, but not limited to, costs for labor, materials and equipment. Each cost record should include, at a minimum, a description of the expenditure with references to the applicable requirements of the Contract Documents, the amount actually paid, the date of payment, and whether the expenditure is part of the original Contract Price, related to an executed Change Order, or otherwise categorized by Contractor as Extra Work. Contractor's failure to comply with this provision as to any claimed cost operates as a waiver of any rights to recover the claimed cost.

(2) Contractor must continue to maintain its Project records in an organized manner for a period of four years after City's acceptance of the Project or following Contract termination, whichever occurs first. Subject to prior notice to Contractor, City is entitled to inspect or audit any of Contractor's Project records relating to the Project or to investigate Contractor's plant or equipment during Contractor's normal business hours.

(J) ***Copies of Contract Documents.*** Contractor and its Subcontractors must keep copies, at the Project site, of the Work-related documents, including the Contract, permit(s), Drawings, Specifications, Addenda, Contract amendments, Change Orders, RFIs and RFI responses, Shop Drawings, and any related written interpretations. The Contract Documents, as-built drawings, and all Worksite copies must be available to City for reference at all times.

2.3 Subcontractors.

(A) ***General.*** All Work which is not performed by Contractor with its own forces must be performed by Subcontractors. City reserves the right to approve or reject any and all Subcontractors proposed to perform the Work.

(B) ***Contractual Obligations.*** Contractor must require every Subcontractor to be bound to the provisions of the Contract Documents as they apply to the Subcontractor's portion(s) of the Work, and to likewise bind their subcontractors or suppliers. Nothing in these Contract Documents creates a contractual relationship between a Subcontractor and City, but City is deemed to be a third-party beneficiary of the contract between Contractor and each Subcontractor.

(C) ***Termination.*** If the Contract is terminated, each Subcontractor's agreement must be assigned by Contractor to City, subject to the prior rights of any surety, provided that City accepts the assignment by written notification, and assumes all rights and obligations of Contractor pursuant to each such subcontract agreement.

(D) ***Substitution of Subcontractor.*** If Contractor requests substitution of a listed Subcontractor under Public Contract Code section 4107, Contractor is solely responsible for all costs City incurs in responding to the request, including legal fees and costs to conduct a hearing.

2.4 Coordination of Work.

(A) ***Concurrent Work.*** City reserves the right to perform or to have performed other work on or adjacent to the Project site while the Work is being performed. Contractor is responsible for coordinating its Work with other work being performed on or adjacent to the Project site, including by any utility companies or agencies, and must avoid hindering, delaying, or interfering with the work of other contractors and subcontractors. To the full extent permitted by law, Contractor must hold harmless and indemnify City against any and all claims arising from or related to Contractor's avoidable, negligent, or willful hindrance of, delay to, or interference with the work of any utility company or agency or another contractor or subcontractor.

(B) ***Defects.*** Before proceeding with any portion of the Work affected by the construction or operations of others, Contractor must give the Project Manager prompt written notification of any defects Contractor discovers which will prevent the proper execution of the Work. Failure to give notice of any such known defects will be deemed acknowledgement by Contractor that the work of others is not defective and will not prevent the proper execution of the Work.

2.5 Submittals. Unless otherwise specified, Contractor must submit to the Engineer for review and acceptance of all schedules, Shop Drawings, samples, product data and similar submittals required by the Contract Documents, or upon request by the Engineer. Unless otherwise specified, all submittals, including Requests for Information, are subject to the general provisions of this Section, as well as specific submittal requirements that may be included in the Special Conditions or elsewhere in the Contract Documents.

Unless otherwise specified, all submittals should be transmitted electronically using standard commercial software programs.

(A) ***General.*** Contractor is responsible for ensuring that its submittals are complete, legible, accurate and conform to the Contract Documents. Incomplete or illegible submittals will be rejected and returned for resubmission. Contractor must use the applicable forms provided or specified for use by the City, including the Project Forms provided with the Contract Documents, and forms provided by City at the pre-construction conference.

(B) ***Time and Manner of Submission.*** Contractor must ensure that its submittals are prepared and delivered in a manner consistent with the current City-accepted schedule for the Work and within the applicable time specified elsewhere in the Contract Documents, or if no time is specified, in such time and sequence so as not to delay the performance of the Work or completion of the Project.

(C) ***Required Contents.*** Each submittal must include the Project name and contract number, Contractor's name and address, the name and address of any Subcontractor or supplier involved with the submittal, the date, and references to applicable Specification section(s) and/or drawing and detail number(s).

(D) ***Required Corrections.*** If corrections are required, Contractor must promptly make and submit any required corrections as specified in full conformance with the requirements of this Section, or other requirements that apply to that submittal. If a submittal remains non-compliant after being re-submitted for a second time, City may back-charge Contractor for all further review time and additional administrative costs. For City employees the hourly amount charged will be 2.5 times the employee's direct hourly payroll cost to the City. For consultants, the amount charged will be 1.25 times the amount billed to the City for additional review and administrative time.

(E) ***Effect of Review and Acceptance.*** Review and acceptance of a submittal by City will not relieve Contractor from complying with the requirements of the Contract Documents. Contractor is responsible for any errors in any submittal, and review or acceptance of a submittal by City is not an assumption of risk or liability by City.

(F) ***Enforcement.*** Any Work performed or any material furnished, installed, fabricated or used without City's prior acceptance of a required submittal is performed or provided at Contractor's risk, and Contractor may be required to bear the costs incident thereto, including the cost of removing and replacing such Work, repairs to other affected portions of the Work or material, and the cost of additional time or services required of City, including costs for the Design Professional, Project Manager, or Inspector.

(G) ***Excessive RFIs.*** A Request for Information (RFI) will be considered excessive or unnecessary if City determines that the explanation or response to the RFI is clearly and unambiguously discernable in the Contract Documents. City's costs to review and respond to excessive or unnecessary RFIs may be deducted from payments otherwise due to Contractor, on the same basis as excessive submittal review, under subsection (D) (Required Corrections).

2.6 Shop Drawings. When Shop Drawings are required by the Specifications or requested by the Engineer, they must be prepared according to best practices at Contractor's expense. The Shop Drawings must be of a size and scale to clearly show all necessary details. Unless otherwise specified by City, Shop Drawings must be provided to the Engineer for review and acceptance at least 30 days before the Work will be performed. If City requires changes, the corrected Shop Drawings must be resubmitted to the Engineer for review within the time specified by the Engineer. For all Project components

requiring Shop Drawings, Contractor will not furnish materials or perform any Work until the Shop Drawings for those components are accepted by City. Contractor is responsible for any errors and omissions in the Shop Drawings, shop fits and field corrections, any deviations from the Contract Documents, and for the results obtained by the use of Shop Drawings. Acceptance of Shop Drawings by City does not relieve Contractor of such responsibility.

Article 3 - Contract Documents

3.1 Interpretation of Contract Documents.

(A) ***Drawings and Specifications.*** The Drawings and Specifications included in the Contract Documents are complementary. If Work is shown on one but not on the other, Contractor must perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The Drawings and Specifications are deemed to include and require everything necessary and reasonably incidental to completion of the Work, whether or not particularly mentioned or shown. Contractor must perform all work and services and supply all things reasonably related to and inferable from the Contract Documents. In the event of a conflict between the Drawings and Specifications, the Specifications will control. Detailed Drawings take precedence over general Drawings, and large scale Drawings take precedence over smaller scale Drawings.

(B) ***Duty to Notify and Seek Direction.*** If Contractor becomes aware of a changed condition in the Project, or of any ambiguity, conflict, inconsistency, discrepancy, omission, or error in the Contract Documents, including under the Drawings or Specifications, Contractor must immediately submit a Request for Information to the Engineer and wait for a response from City before proceeding further with the related Work. The RFI must notify City of the issue and request clarification, interpretation or direction. The Engineer's clarification, interpretation or direction will be final and binding on Contractor. If Contractor proceeds with the related Work before obtaining City's response, Contractor will be responsible for any resulting costs, including the cost of correcting any incorrect or defective Work that results. City will not extend the Contract Time due to Contractor's failure to submit a timely RFI to the Engineer.

(C) ***Figures and Dimensions.*** Figures control over scaled dimensions.

(D) ***Technical or Trade Terms.*** Any terms that have well-known technical or trade meanings will be interpreted in accordance with those meanings, unless otherwise specifically defined in the Contract Documents.

(E) ***Measurements.*** Contractor must verify all relevant measurements at the Worksite before ordering any material or performing any Work, and will be responsible for the correctness of those measurements.

(F) ***Limitations.*** Any arrangement or division of the Drawings and Specifications into sections is for convenience and is not intended to limit the Work required by separate trades. A conclusion presented in the Drawings or Specifications is only a recommendation. Actual locations and depths must be determined by Contractor's field investigation. Contractor may request access to underlying or background information in City's possession that is necessary for Contractor to form its own conclusions.

3.2 Order of Precedence. Information included in one Contract Document but not in another will not be considered a conflict or inconsistency. Unless otherwise specified in the Special Conditions, in case of any conflict or inconsistency among the Contract

Documents, the following order of precedence will apply, beginning from highest to lowest:

(A) Change Orders;
(B) Addenda;
(C) Contract;
(D) Notice to Proceed;
(E) Notice of Award;
(F) Special Conditions;
(G) General Conditions;
(H) Payment, Performance and Warranty Bonds;
(I) Specifications;
(J) Drawings;
(K) Contractor's Bid Proposal and attachments;
(L) Notice Inviting Bids;
(M) Instructions to Bidders;
(N) the City of Cupertino's Standard Details; and
(O) Any documents prepared by and on behalf of a third party, that were not prepared specifically for this Project, such as the Caltrans Standard Specifications or Caltrans Special Provisions.

3.3 Caltrans Standard Specifications. Any reference to or incorporation of the Standard Specifications of the State of California, Department of Transportation ("Caltrans"), including "Standard Specifications," "Caltrans Specifications," "State Specifications," or "CSS," means the most current edition of Caltrans' Standard Specifications, unless otherwise specified ("Caltrans Standard Specifications"), including the most current amendments as of the date that Contractor's bid was submitted for this Project. The following provisions apply to use of or reference to the Caltrans Standard Specifications or Special Provisions:

(A) ***Limitations.*** The "General Provisions" of the Caltrans Standard Specifications, i.e., Sections 1 through 9, do not apply to these Contract Documents with the exception of any specific provisions, if any, which are expressly stated to apply to these Contract Documents.

(B) ***Conflicts or Inconsistencies.*** If there is a conflict or inconsistency between any provision in the Caltrans Standard Specifications or Special Provisions and a provision of these Contract Documents, as determined by City, the provision in the Contract Documents will govern.

(C) ***Meanings.*** Terms used in the Caltrans Standard Specifications or Special Provisions are to be interpreted as follows:

(1) Any reference to the "Engineer" is deemed to mean the City Engineer.

(2) Any reference to the "Special Provisions" is deemed to mean the Special Conditions, unless the Caltrans Special Provisions are expressly included in the Contract Documents listed in Section 2 of the Contract.

(3) Any reference to the "Department" or "State" is deemed to mean City.

3.4 For Reference Only. Contractor is responsible for the careful review of any document, study, or report provided by City or appended to the Contract Documents solely for informational purposes and identified as "For Reference Only." Nothing in any document, study, or report so appended and identified is intended to supplement, alter, or void any provision of the Contract Documents. Contractor is advised that City or its

representatives may be guided by information or recommendations included in such reference documents, particularly when making determinations as to the acceptability of proposed materials, methods, or changes in the Work. Any record drawings or similar final or accepted drawings or maps that are not part of the Contract Documents are deemed to be For Reference Only. The provisions of the Contract Documents are not modified by any perceived or actual conflict with provisions in any document that is provided For Reference Only.

3.5 Current Versions. Unless otherwise specified by City, any reference to standard specifications, technical specifications, or any City or state codes or regulations means the latest specification, code or regulation in effect at the time the Contract is signed.

3.6 Conformed Copies. If City prepares a conformed set of the Contract Documents following award of the Contract, it will provide Contractor with a copy of the electronic file in PDF format. It is Contractor's responsibility to ensure that all Subcontractors, including fabricators, are provided with the conformed set of the Contract Documents at Contractor's sole expense.

Article 4 - Bonds, Indemnity, and Insurance

4.1 Payment and Performance Bonds. Within ten days following issuance of the notice of award, Contractor is required to provide a payment bond and a performance bond, each in the penal sum of not less than 100% of the Contract Price, using the bond forms included with the Contract Documents.

(A) ***Surety.*** Each bond must be issued by a surety admitted in California, and the surety must have a financial rating from A.M. Best Company of B+, class 7 or better, or as otherwise acceptable to the City. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City. If Contractor fails to substitute an acceptable surety within the specified time, City may, at its sole discretion, withhold payment from Contractor until the surety is replaced to City's satisfaction, or terminate the Contract for default.

(B) ***Supplemental Bonds for Increase in Contract Price.*** If the Contract Price increases during construction by five percent or more over the original Contract Price, Contractor must provide supplemental or replacement bonds within ten days of written notice from City pursuant to this Section, covering 100% of the increased Contract Price and using the bond forms included with the Contract Documents.

4.2 Indemnity. To the fullest extent permitted by law, Contractor must indemnify, defend, and hold harmless City, its Council, officers, officials, employees, agents, volunteers and consultants (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability, loss, damage, claims, causes of action, demands, charges, costs and expenses (including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of or in connection with the acts or omissions of Contractor, its employees, Subcontractors, representatives, or agents, in bidding or performing the Work or in failing to comply with any obligation of Contractor under the Contract, except such Liability caused by the active negligence, sole negligence, or willful misconduct of an Indemnitee. This indemnity requirement applies to any Liability arising from alleged defects in the content or manner of submission of Contractor's bid for the Contract. Contractor's failure or refusal to timely accept a tender of defense pursuant to this Contract will be deemed a material breach of the Contract. City will timely notify Contractor upon receipt of any third-party claim relating to the Contract, as required by

Public Contract Code section 9201. Contractor's indemnity obligations under this Contract will survive the expiration or any early termination of the Contract.

4.3 Insurance.

(A) ***Policies and Limits.*** Within ten days following issuance of the Notice of Award, Contractor must provide City with satisfactory proof, using the specified insurance forms, that Contractor has procured insurance policies for the following classes of insurance in the form and with limits and deductibles specified below:

(1) *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 must provide for all operations and include independent contractors, products liability, completed operations for one year after City accepts the Project. The limits of such insurance must be at least $2,000,000 each occurrence, $4,000,000 general aggregate limit. The policies must be endorsed to provide broad form property damage coverage. The CGL insurance coverage may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or umbrella policies, provided each such policy complies with the requirements set forth herein.

(2) *Comprehensive Automobile Liability Insurance* covering all owned, non-owned, and hired vehicles. Such insurance must provide coverage not less than the standard comprehensive automobile liability policy with limits not less than $1,000,000 each person bodily injury, $1,000,000 each occurrence bodily injury, and $1,000,000 each occurrence property damage.

(3) *All-Risk Course of Construction Insurance* (Builder's Risk) for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and must insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws, water damage, flood, and damage caused by frost and freezing, in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible must not exceed $25,000. Each loss must be borne by Contractor.

(4) *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, $1,000,000 each occurrence.

(B) ***General.*** All policies of insurance must be placed with insurers acceptable to City. The insurance underwriter(s) must have an A. M. Best Company Financial Strength rating of A or better and Financial Size rating of VII or higher, or otherwise acceptable to the City. Required minimum amounts of insurance may be increased should conditions of Work, in opinion of City, warrant such increase. Contractor must increase required insurance amounts upon direction by City.

(C) ***Required Endorsements.*** The policies required under subsections (A)(1)-(3), above, must be endorsed as follows, using the forms specified:

(1) Name the City of Cupertino, a municipal corporation of the State of California, its City Council, and their employees, representatives, consultants (including without limitation Design Professional), and agents, as additional insureds, but only with respect to liability arising out of the activities of the named insured.

(2) Each such policy must 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 under subsections (A)(1)-(3), above.(Endorsement of aggregate limits of insurance per project)

(3) Insurance must be primary and no other insurance or self-insured retention carried or held by City must be called upon to contribute to a loss covered by insurance for the named insured.

(4) Insurance must contain a provision requiring the insurance carriers to waive their rights of subrogation against City and all additional insureds, as well as other insurance carriers for the Work.

(D) ***Documentation.*** Proof of insurance and endorsements must be provided using the form titled "*Certificate of Insurance to the City of Cupertino*" and completing the endorsement forms provided with the Contract Documents. Written notice of cancellation, non-renewal, or reduction in coverage of any policy must be mailed to City pursuant to Section 11 of the Contract (Notice), address to the attention of: Contract Administration/Inspection, 30 days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. The required insurance must cover the activities of Contractor and its Subcontractors relating to or arising from the performance of the Work, and must remain in full force and effect at all times during the period covered by the Contract, through the date of City's acceptance the Project. Contractor must keep insurance in force during warranty and guarantee periods, except that Contractor may discontinue All-Risk Course of Construction Insurance (Builder's Risk) after Final Payment. At the time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor must submit evidence that insurance policies will be in effect during requested additional period of time. Upon City's request, Contractor must submit to City, within 30 Days, copies of the actual insurance policies or renewals or replacements.

(E) ***Payment of Premiums.*** Contractor must 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.

(F) ***Workers' Compensation.*** 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 Price the amount so paid, or require Contractor to reimburse City.

(G) ***No Limitation of Liability.*** Nothing in this Section 4.3 must 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.

(H) ***Subcontractors.*** All Subcontractors must maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work, except that Subcontractors need to obtain coverage of not less than $2,000,000 each occurrence, $4,000,000 general aggregate limit of comprehensive general liability insurance. Contractor must require each Subcontractor to furnish proof thereof to City within ten days of City's request.

(I) ***Professional Liability.*** The following provisions apply to any licensed professional engaged by Contractor to perform portions of the Work ("Professional").

(1) Each Professional must maintain the following insurance at its sole cost and expense:

(a) Provided such insurance is customarily required by City when professionals engaged in the profession practiced by Professional contract directly with City, professional liability insurance, insuring against professional errors and omissions arising from Professional's work on the Project, in an amount not less than $1,000,000 combined single limit for each occurrence. If Professional cannot provide an occurrence policy, Professional must provide insurance covering claims made as a result of performance of Work on this Project and must maintain such insurance in effect for not less than two years following Final Completion of the Project.

(b) All insurance required by subsections (A)(1)-(2) & (4), above. Professional must satisfy all other provisions of subsections (A)-(F) of this Section 4.3 relating to that insurance, including without limitation providing required insurance certificates (containing the required endorsements) before commencing its Work on the Project.

(J) ***Pollution Insurance.*** If required by City, Contractor must obtain and maintain contractor's pollution legal liability insurance in a form, with limits, and from an insuring entity reasonably satisfactory to City.

Article 5 - Contract Time

5.1 Time is of the Essence. Time is of the essence in Contractor's performance and completion of the Work, and Contractor must diligently prosecute the Work and complete it within the Contract Time.

(A) ***Notice to Proceed.*** Contractor must commence the Work on the date indicated in the Notice to Proceed, and must fully complete the Work in strict compliance with all requirements of the Contract Documents and within the Contract Time. The Notice to Proceed will not be issued until Contractor has executed and returned the Contract, the required bonds, insurance certificates and endorsements and any other submittals required prior to issuance of the Notice to Proceed, subject to City's approval of all such

documents. Contractor may not begin performing Work on the Project Site before the date authorized in the Notice to Proceed. After receiving the Notice to Proceed, Contractor must notify the City in writing of the date Contractor intends to begin Work on the Project, at least 24 hours in advance of beginning the Work. Contractor is not entitled to compensation or credit for any Work performed before the date specified in the Notice to Proceed, with the exception of any schedules, submittals, or other requirements that must be provided or performed before issuance of the Notice to Proceed.

(B) ***Rate of Progress.*** Contractor and its Subcontractors must, at all times, provide workers, materials, and equipment sufficient to maintain the rate of progress necessary to ensure full completion of the Work within the Contract Time. If City determines that Contractor is failing to prosecute the Work at a sufficient rate of progress, City may, in its sole discretion, direct Contractor to provide additional workers, materials, or equipment, or to work additional hours or days without additional cost to City, in order to achieve a rate of progress satisfactory to City. If Contractor fails to comply with City's directive in this regard, City may, at Contractor's expense, separately contract for additional workers, materials, or equipment or use City's own forces to achieve the necessary rate of progress. Alternatively, City may terminate the Contract based on Contractor's default.

5.2 Schedule Requirements. Contractor must prepare all schedules using standard scheduling software acceptable to the Engineer, and must provide the schedules in electronic and paper form as requested by the Engineer. In addition to the general scheduling requirements set forth below, Contractor must also comply with any scheduling requirements included in the Special Conditions or in the Technical Specifications.

(A) ***Baseline (As-Planned) Schedule.*** Within ten calendar days following City's issuance of the Notice to Proceed (or as otherwise specified in the Special Conditions), Contractor must submit to City for review and acceptance a baseline (as-planned) schedule using critical path methodology showing in detail how Contractor plans to perform and fully complete the Work within the Contract Time, including labor, equipment, materials and fabricated items. The baseline schedule must show the order of the major items of Work and the dates of start and completion of each item, including when the materials and equipment will be procured. The schedule must also include the work of all trades, reflecting anticipated labor or crew hours and equipment loading for the construction activities, and must be sufficiently comprehensive and detailed to enable progress to be monitored on a day-by-day basis. For each activity, the baseline schedule must be dated, provided in the format specified in the Contract Documents or as required by City, and must include, at a minimum, a description of the activity, the start and completion dates of the activity, and the duration of the activity.

(1) *Specialized Materials Ordering*. Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not readily available from material suppliers. Contractor must also retain documentation of the purchase orders date(s).

(B) ***City's Review of Schedules.*** City will review and may note exceptions to the baseline schedule, and to the progress schedules submitted as required below, to assure completion of the Work within the Contract Time. Contractor is solely responsible for resolving any exceptions noted in a schedule and must, within seven days, correct the schedule to address them.

(C) ***Progress Schedules.*** After City accepts the final baseline schedule with no exceptions, Contractor must submit an updated progress schedule and three-week look-ahead schedule, in the format specified by City, for review and acceptance with each application for a progress payment, or when otherwise specified by City, until completion

of the Work. The updated progress schedule must: show how the actual progress of the Work as constructed to date compares to the baseline schedule; reflect any proposed changes in the construction schedule or method of operations, including to achieve Project milestones within the Contract Time; and identify any actual or potential impacts to the critical path. Contractor must also submit periodic reports to City of any changes in the projected material or equipment delivery dates for the Project.

(1) *Float*. The progress schedule must show early and late completion dates for each task. The number of days between those dates will be designated as the "float." Any float belongs to the Project and may be allocated by the Engineer to best serve timely completion of the Project.

(2) *Failure to Submit Schedule*. Reliable, up-to-date schedules are essential to efficient and cost-effective administration of the Project and timely completion. If Contractor fails to submit a schedule within the time periods specified in this Section, or submits a schedule to which City has noted exceptions that are not corrected, City may withhold up to ten percent from payment(s) otherwise due to Contractor until the exceptions are resolved, the schedule is corrected and resubmitted, and City has accepted the schedule. In addition, Contractor's failure to comply with the schedule requirements in this Section 5.2 will be deemed a waiver of any claims for Excusable Delay or loss of productivity arising when Contractor is out of compliance, subject only to the limits of Public Contract Code section 7102.

(D) ***Recovery Schedule.*** If City determines that the Work is more than one week behind schedule, within seven days following written notice of such determination, Contractor must submit a recovery schedule, showing how Contractor intends to perform and complete the Work within the Contract Time, based on actual progress to date.

(E) ***Effect of Acceptance.*** Contractor and its Subcontractors must perform the Work in accordance with the most current City-accepted schedule unless otherwise directed by City. City's acceptance of a schedule does not operate to extend the time for completion of the Work or any component of the Work, and will not affect City's right to assess liquidated damages for Contractor's unexcused delay in completing the Work within the Contract Time.

(F) ***Posting.*** Contractor must at all times maintain a copy of the most current City-accepted progress or recovery schedule posted prominently in its on-site office.

(G) ***Reservation of Rights.*** City reserves the right to direct the sequence in which the Work must be performed or to make changes in the sequence of the Work in order to facilitate the performance of work by City or others, or to facilitate City's use of its property. The Contract Time or Contract Price may be adjusted to the extent such changes in sequence actually increase or decrease Contractor's time or cost to perform the Work.

(H) ***Authorized Working Days and Times.*** Contractor is limited to working Monday through Friday, excluding holidays, during City's normal business hours, except as provided in the Special Conditions or as authorized in writing by City. City reserves the right to charge Contractor for additional costs incurred by City due to Work performed on days or during hours not expressly authorized in the Contract Documents, including reimbursement of costs incurred for inspection, testing, and construction management services.

5.3 Delay and Extensions of Contract Time.

(A) ***Notice of Delay.*** If Contractor becomes aware of any actual or potential delay affecting the critical path, Contractor must promptly notify the Engineer in writing, regardless of the nature or cause of the delay, so that City has a reasonable opportunity to mitigate or avoid the delay.

(B) ***Excusable Delay.*** The Contract Time may be extended if Contractor encounters "Excusable Delay," which is an unavoidable delay in completing the Work within the Contract Time due to causes completely beyond Contractor's control, and which Contractor could not have avoided or mitigated through reasonable care, planning, foresight, and diligence. Grounds for Excusable Delay may include fire, natural disasters including earthquake or unusually severe weather, acts of terror or vandalism, epidemic, unforeseeable adverse government actions, unforeseeable actions of third parties, encountering unforeseeable hazardous materials, unforeseeable site conditions, or suspension for convenience under Article 13.

(C) ***Non-Excusable Delay.*** Delay which Contractor could have avoided or mitigated through reasonable care, planning, foresight and diligence is "Non-Excusable Delay." Contractor is not entitled to an extension of Contract Time or any compensation for Non-Excusable Delay, or for Excusable Delay that is concurrent with Non-Excusable Delay. Non-Excusable Delay includes delay caused by:

(1) weather conditions which are normal for the location of the Project, as determined by reliable records, including monthly rainfall averages, for the preceding ten years;

(2) Contractor's failure to order equipment and materials sufficiently in advance of the time needed for timely completion of the Work;

(3) Contractor's failure to provide adequate notification to utility companies or agencies for connections or services necessary for the timely performance and completion of the Work;

(4) foreseeable conditions which Contractor could have ascertained from reasonably diligent inspection of the Worksite or review of the Contract Documents or other information provided or available to Contractor; or

(5) Contractor's financial inability to perform the Work, including insufficient funds to pay its Subcontractors or suppliers.

(D) ***Compensable Delay.*** Pursuant to Public Contract Code section 7102, in addition to entitlement to an extension of Contract Time, Contractor is entitled to compensation for costs incurred due to delay caused solely by City, when that delay is unreasonable under the circumstances involved and not within the contemplation of the parties ("Compensable Delay").

(E) ***Concurrent Delay.*** Contractor is not entitled to an extension of Contract Time or recovery of costs for any Compensable Delay that is concurrent with Non-Excusable Delay.

(F) ***Weather Delay.*** A "Weather Delay Day" is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than 40% of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Worksite clean up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule.

(1) Based on historic records for the Project location from the Western Regional Climate Center, Contractor's schedule should assume the following number of normal Weather Delay Days and precipitation for each month:

Month	# Normal Weather Delay Days	Precipitation
January	6	2.86
February	6	2.66
March	6	2.29
April	3	1.20
May	1	0.44
June	0	0.10
July	0	0.02
August	0	0.07
September	1	0.19
October	2	0.76
November	4	1.51
December	5	2.43
Total	34	14.53

(2) Contractor will be entitled to a non-compensable extension of the Contract Time for each Weather Delay Day in excess of the normal Weather Delay Days within a given month, as set forth in Section 5.3(F)(1) above, subject to the following limitations:

a. Contractor must fully comply with the applicable procedures in Article 5 and 6 of these General Conditions regarding requests to modify the Contract Time.

b. Normal Weather Delay Days which do not occur during a given month do not carry over to another month.

c. Contractor will not be entitled to an extension of time for a Weather Delay Day to the extent Contractor is responsible for concurrent delay on that day.

(G) ***Recoverable Costs.*** Contractor is not entitled to compensation for Excusable Delay unless it is Compensable Delay, as defined above. Contractor is entitled to recover only the actual, direct, reasonable, and substantiated costs ("Recoverable Costs") for each working day that the Compensable Delay prevents Contractor from proceeding with more than 50% of the critical path Work scheduled for that day, based on the most recent progress schedule accepted by City. Recoverable Costs will not include home office overhead or lost profit.

(H) ***Request for Extension of Contract Time or Recoverable Costs.*** A request for an extension of Contract Time or any associated Recoverable Costs must be submitted in writing to City within ten calendar days of the date the delay is first encountered, even if the duration of the delay is not yet known at that time, or any entitlement to the Contract Time extension or to the Recoverable Costs will be deemed waived. In addition to complying with the requirements of this Article 5, the request must be submitted in compliance with the Change Order request procedures in Article 6 below. Strict compliance with these requirements is necessary to ensure that any delay or consequences of delay may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project and timely performance of the Work. Any request for

an extension of Contract Time or Recoverable Costs that does not strictly comply with all of the requirements of Article 5 and Article 6 will be deemed waived.

(1) *Required Contents.* The request must include a detailed description of the cause(s) of the delay, and must also describe the measures that Contractor has taken to mitigate the delay and/or its effects, including efforts to mitigate the cost impact of the delay, such as by workforce management or by a change in sequencing. If the delay is still ongoing at the time the request is submitted, the request should also include Contractor's plan for continued mitigation of the delay or its effects.

(2) *Delay Days and Costs.* The request must specify the number of days of Excusable Delay claimed, or provide a realistic estimate if the duration of the delay is not yet known. If Contractor believes it is entitled to Recoverable Costs for Compensable Delay, the request must specify the amount and basis for the Recoverable Costs that are claimed, or provide a realistic estimate if the amount is not yet known. Any estimate of delay duration or cost must be updated in writing and submitted with all required supporting documentation as soon as the actual time and cost is known. The maximum extension of Contract Time will be the number of days, if any, by which an Excusable Delay or a Compensable Delay exceeds any concurrent Non-Excusable Delay. Contractor is entitled to an extension of Contract Time, or compensation for Recoverable Costs, only if, and only to the extent that, such delay will unavoidably delay Final Completion.

(3) *Supporting Documentation.* The request must also include any and all supporting documentation necessary to evidence the delay and its actual impacts, including scheduling and cost impacts with a time impact analysis using critical path methodology and demonstrating the unavoidable delay to Final Completion. The time impact analysis must be submitted in a form or format acceptable to City.

(4) *Burden of Proof.* Contractor has the burden of proving that: the delay was an Excusable or Compensable Delay, as defined above; Contractor has made reasonable efforts to mitigate the delay and its schedule and cost impacts; the delay will unavoidably result in delaying Final Completion; and any Recoverable Costs claimed by Contractor were actually incurred and were reasonable under the circumstances.

(5) *Legal Compliance.* Nothing in this Section 5.3 is intended to require the waiver, alteration, or limitation of the applicability of Public Contract Code section 7102.

(6) *No Waiver.* Any grant of an extension of Contract Time, or compensation for Recoverable Costs due to Compensable Delay, will not operate as a waiver of City's right to assess liquidated damages for Non-Excusable Delay.

(7) *Dispute Resolution.* In the event of a dispute over entitlement to an extension of Contract Time or compensation for Recoverable Costs, Contractor may not stop working pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work. Contractor's sole recourse for an unresolved dispute based on City's rejection of a Change Order request for an extension of Contract Time or compensation for Recoverable Costs is to comply with the Dispute Resolution provisions set forth in Article 12 below.

5.4 Liquidated Damages. It is expressly understood that if Final Completion is not achieved within the Contract Time, City will suffer damages from the delay that are difficult to determine and accurately specify. Pursuant to Public Contract Code section 7203, if Contractor fails to achieve Final Completion within the Contract Time, City will charge Contractor in the amount specified in the Contract for each day that Final Completion is delayed beyond the Contract Time, as liquidated damages and not as a penalty.

(A) ***Liquidated Damages.*** Liquidated damages will not be assessed for any Excusable or Compensable Delay, as set forth above.

(B) ***Milestones.*** Liquidated damages may also be separately assessed for failure to meet milestones specified elsewhere in the Contract Documents.

(C) ***Setoff.*** City is entitled to deduct the amount of liquidated damages assessed against any payments otherwise due to Contractor, including unreleased retention. If there are insufficient Contract funds remaining to cover the full amount of liquidated damages assessed, City is entitled to recover the balance from Contractor or its performance bond surety.

(D) ***Occupancy or Use.*** Occupancy or use of the Project in whole or in part prior to Final Completion does not constitute City's acceptance of the Project and will not operate as a waiver of City's right to assess liquidated damages for Contractor's Non-Excusable Delay in achieving Final Completion.

(E) ***Other Remedies.*** City's right to liquidated damages under this Section applies only to damages arising from Contractor's Non-Excusable Delay or failure to complete the Work within the Contract Time. City retains its right to pursue all other remedies under the Contract for other types of damage, including damage to property or persons, or for defective materials or workmanship.

Article 6 - Contract Modification

6.1 Contract Modification and Changes in Work. Modifications to the Contract are valid and legally binding only pursuant to a written, duly authorized and signed Change Order. City also reserves the right to make changes in the Work without invalidating the Contract. City may direct changes in the Work, which may include Extra Work as set forth in subsection (B) below, deletion or modification of portions of the Work, or other modifications determined by City, acting in its sole discretion, to be in City's best interest. Pursuant to section 3.23.170 of the Cupertino Municipal Code, City reserves the right to delete up to 25% of the Work. Any change in the Work, whether directed by City or pursuant to Contractor's request for a Change Order under Section 6.2 below, will not be a valid and binding change to the Contract unless it is formalized in a Change Order, which may include commensurate changes in the Contract Price or Contract Time as applicable. Contractor must promptly comply with City-directed changes in the Work in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement as to adjustments to the Contract Price or Contract Time for the change in the Work or for the Extra Work. Contractor is not entitled to extra compensation pursuant to Public Contract Code section 7101 based on cost reduction changes or "value engineering," unless otherwise specified in the Special Conditions, or unless expressly authorizing in advance in writing by City.

(A) ***Disputes.*** In the event of a dispute over entitlement to or the amount of a change in Contract Time or a change in Contract Price related to a City-directed change in the Work, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty

to diligently prosecute the performance and timely completion of the Work, including the Work in dispute. In the event that City and Contractor dispute whether a portion or portions of the Work are already required by the Contract Documents or constitute Extra Work, or otherwise dispute the interpretation of any portion(s) of the Contract Documents, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute, as directed by City. Contractor's sole recourse for an unresolved dispute related to changes in the Work or performance of any Extra Work is to comply with the dispute resolution provisions set forth in Article 12, below.

(B) ***Extra Work.*** City may direct Contractor to perform Extra Work related to the Project. Contractor must promptly perform any Extra Work as directed or authorized by City in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement on adjustments to the Contract Price or Contract Time for such Extra Work. Contractor must maintain detailed daily records that itemize the cost of each element of Extra Work, and sufficiently distinguish the direct cost of the Extra Work from the cost of other Work performed. For each day that Contractor performs Extra Work, or Work that Contractor contends is Extra Work, Contractor must submit no later than the following Working Day, a daily report of the Extra Work performed that day and the related costs, together with copies of certified payroll, invoices, and other documentation substantiating the costs ("Extra Work Report"). The Engineer will make any adjustments to Contractor's Extra Work Report(s) based on the Engineer's records of such Work. When an Extra Work Report(s) is agreed on and signed by both City and Contractor, the Extra Work Report(s) will become the basis for payment under a duly authorized and signed Change Order. Failure to submit the required documentation by close of business on the next Working Day is deemed a full and complete waiver for any change in the Contract Price or Contract Time for any Extra Work performed that day.

(C) ***Remedy for Non-Compliance.*** Contractor's failure to promptly comply with a City-directed change is deemed a material breach of the Contract, and in addition to all other remedies available to it, City may, at its sole discretion, hire another contractor or use its own forces to complete the disputed Work at Contractor's sole expense, and may deduct the cost from the Contract Price.

6.2 Contractor Change Order Requests. Contractor must submit a request or proposal for a change in the Work, compensation for Extra Work, or a change in the Contract Price or Contract Time as a written Change Order request or proposal.

(A) ***Time for Submission.*** Any request for a change in the Contract Price or the Contract Time must be submitted in writing to the Engineer within ten calendar days of the date that Contractor first encounters the circumstances, information or conditions giving rise to the Change Order request, even if the total amount of the requested change in the Contract Price or impact on the Contract Time is not yet known at that time. If City requests that Contractor propose the terms of a Change Order, unless otherwise specified in City's request, Contractor must provide the Engineer with a written proposal for the change in the Contract Price or Contract Time within five working days of receiving City's request, in a form satisfactory to the Engineer.

(B) ***Required Contents.*** Any Change Order request or proposal submitted by Contractor must include a complete breakdown of actual or estimated costs and credits, and must itemize labor, materials, equipment, taxes, insurance, and subcontract amounts and if applicable, Extra Work Reports. Any estimated cost must be updated in writing as soon as the actual amount is known.

(C) ***Required Documentation.*** All claimed costs must be fully documented, and any related request for an extension of time or delay-related costs must be included at that time and in compliance with the requirements of Article 5 of the General Conditions.

(D) ***Required Form.*** Contractor must use City's form(s) for submitting all Change Order requests or proposals, unless otherwise specified by City.

(E) ***Certification.*** All Change Order requests must be signed by Contractor and must include the following certification:

> "The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Change Order request are true and correct. Contractor warrants that this Change Order request is comprehensive and complete as to the Work or changes referenced herein, and agrees that any costs, expenses, or time extension request not included herein is deemed waived. Contractor understands that submission of claims which have no basis in fact or which Contractor knows to be false may violate the False Claims Act, as set forth in Government Code sections 12650 et seq."

6.3 Adjustments to Contract Price. The amount of any increase or decrease in the Contract Price will be determined based on one of the following methods, but in the order provided with unit pricing taking precedence over the other methods:

(A) ***Unit Pricing.*** Amounts previously provided by Contractor in the form of unit prices, either in a bid schedule or schedule of values, will apply if unit pricing has previously been provided in Contractor's accepted bid schedule or schedule of values for the affected Work. No additional markup for overhead, profit, or other indirect costs will be added to the calculation.

(B) ***Lump Sum.*** A mutually agreed upon lump sum for the affected Work with no additional markup for overhead, profit, or other indirect costs.

(C) ***Time and Materials.*** On a time and materials basis, including allowed markup for overhead, profit, and all other indirect costs, and which may include a not-to-exceed limit, calculated as the total of the following sums:

(1) All direct labor costs plus 15% markup;

(2) All direct material costs, including sales tax, plus 15% markup;

(3) All direct plant and equipment rental costs, plus 15% markup;

(4) All direct subcontract costs plus ten percent markup; and

(5) Increased bond or insurance premium costs computed at 1.5% of total of the previous four sums.

6.4 Unilateral Change Order. If the parties dispute the terms of a proposed Change Order, including disputes over the amount of compensation or extension of time that Contractor has requested, dispute over the value of deleted or changed Work, disputes as to what constitutes Extra Work, or disputes as to quantities used, City may elect to issue a unilateral Change Order, directing performance of the Work, and authorizing a change in the Contract Price or Contract Time up to the amount City believes is merited. Contractor's sole recourse to dispute the terms of a unilateral Change Order is to submit a timely Claim pursuant to Article 12, below.

6.5 Non-Compliance Deemed Waiver. Contractor waives its entitlement to any increase in the Contract Price or Contract Time if Contractor fails to fully comply with the provisions of this Article. Contractor will not be paid for unauthorized Extra Work.

Article 7 - General Construction Provisions

7.1 Permits and Taxes.

(A) ***General.*** Contractor must obtain and pay for all permits, fees, or licenses required to perform the Work, except that if a City building permit is required, no fee will be charged. Contractor must cooperate with and provide notifications to all government agencies with jurisdiction over the Project, as may be required. Contractor must provide City with copies of all notices, permits, licenses, and renewals required for the Work.

(B) ***Federal Excise Tax.*** Contractor must pay for all taxes on labor, material and equipment, except Federal Excise Tax to the extent that City is exempt from Federal Excise Tax.

7.2 Temporary Facilities. Contractor must provide, at Contractor's sole expense, any and all temporary facilities for the Project, including an onsite staging area for material and equipment, a field office, sanitary facilities, utilities, storage, scaffolds, barricades, walkways, and any other temporary structure required to safely perform the Work along with any utility services incidental thereto. The location of all temporary facilities must be approved by the City prior to installation.

(A) ***Standards.*** Temporary facilities must be safe and adequate for the intended use, and installed and maintained in accordance with all applicable federal, state, and local laws, codes, and regulations.

(B) ***Screening.*** Contractor must fence and screen the Project site and staging area, and its operation must minimize inconvenience to neighboring properties and be approved by the City.

(C) ***Utilities.*** Contractor must install and maintain the light, power, water and all other utilities required for the Project site, including the piping, wiring, lamps and related equipment necessary to perform the Work.

(D) ***Removal and Repair.*** Contractor must promptly remove all such temporary facilities when they are no longer needed or upon completion of the Work, whichever comes first. Contractor must promptly repair any damage to City's property or to other property caused by the installation, use, or removal of the temporary facilities, and must promptly restore the property to its original or intended condition.

(E) ***Additional Requirements.*** Additional provisions pertaining to temporary facilities may be included in the Specifications or Special Conditions.

7.3 Noninterference and Additional Work Areas. Contractor must avoid interfering with City's use of its property at or adjacent to the Project site, including use of roadways, entrances, parking areas, walkways, and structures. Contractor must also minimize disruption of access to private property in the Project vicinity. Contractor must coordinate with affected property owners, tenants, and businesses, and maintain some vehicle and pedestrian access to their residences or properties at all times. Temporary access ramps, fencing or other measures must be provided as needed. Before blocking access to a private driveway or parking lot, Contractor must notify the affected parties of the pending

closure and allow them to remove vehicles. Private driveways, residences and parking lots must have access to a roadway during non-Work hours.

(A) ***Offsite Acquisition.*** Unless otherwise provided by City, Contractor must acquire, use and dispose of, at its sole expense, any additional Work areas, easements, and temporary facilities necessary to access and perform the Work.

(B) ***Offsite Staging Area and Field Office*****.** If additional space beyond the Project site is needed, such as for the staging area or the field office, Contractor may need to make arrangements with the nearby property owner(s) to secure the space. Before using or occupying any property owned by a third party, Contractor must provide City with a copy of the necessary license agreement, easement, or other written authorization from the property owner, together with a written release from the property owner holding City harmless from any related liability, in a form acceptable to the City Attorney.

7.4 Signs. No signs may be displayed on or about City's property, except signage which is required by law or by the Contract Documents, without City's prior written approval as to size, design, and location.

7.5 Worksite and Nearby Property Protections.

(A) ***General.*** Contractor is responsible at all times, on a 24-hour basis and at its sole cost, for protecting the Work, the Project site, and the materials and equipment to be incorporated into the Work, until the notice of completion has been recorded. Except as specifically authorized by City, Contractor must confine its operations to the area of the Project site indicated in the Drawings. Contractor is liable for any damage caused by Contractor or its Subcontractors to the Work, City's property, the property of adjacent or nearby property owners (including real property, improvements and utilities and personal property, and the work or personal property of other contractors working for City. In addition, Contractor is responsible for damage caused by its failure to adequately secure the Work or any Worksite.

(1) Subject to City's approval, Contractor will provide and install safeguards to protect the Work, the Project site, City's real or personal property, and the real or personal property of adjacent or nearby property owners.

(2) Cupertino Sanitary District and the City of Sunnyvale own and operate wastewater systems within Cupertino and they may not be interrupted. If the Work disrupts existing sewer facilities, Contractor must immediately notify City to determine who owns the system and establish a plan, subject to the systems owner's approval, to convey the sewage in closed conduits back into the sanitary sewer system. Sewage must not be permitted to flow in trenches or be covered by backfill.

(3) Contractor must remove with due care, and store at City's request, any objects or material from the Project site that City will salvage or reuse at another location(s).

(4) If directed by Engineer, Contractor must promptly repair or replace any such property damage, as specified by the Engineer. However, acting in its sole discretion, City may elect to have the property damage remedied otherwise, and may deduct the cost to repair or replace the damaged property from payment otherwise due to Contractor.

(B) ***Securing Project Site.*** After completion of Work each day, Contractor must secure the Project site and, to the extent feasible, make the area reasonably accessible

to the public unless City approves otherwise. All excess materials and equipment not protected by approved traffic control devices must be relocated to the staging area or demobilized. Trench spoils must be hauled off the Project site daily and open excavations must be protected with steel plates. Contractor and Subcontractor personnel may not occupy or use the Project site for any purpose during non-Work hours, except as may be provided in the Contract Documents or pursuant to prior written authorization from City.

(C) ***Unforeseen Conditions.*** If Contractor encounters facilities, utilities, or other unknown conditions not shown on or reasonably inferable from the Drawings or apparent from inspection of the Project site, Contractor must immediately notify the City and promptly submit a Request for Information to the Engineer. Contractor must avoid taking any action which could cause damage to the facilities or utilities pending further direction from the Engineer. The Engineer's written response will be final and binding on Contractor. If the Engineer's subsequent direction to Contractor affects Contractor's cost or time to perform the Work, Contractor may submit a Change Order request as set forth in Article 6 above.

(D) ***Support; Adjacent Properties.*** Contractor must provide, install, and maintain all shoring, bracing, and underpinning necessary to provide support to City's property and adjacent properties and improvements thereon. Contractor must provide notifications to adjacent property owners as may be required by law.

7.6 Materials and Equipment.

(A) ***General.*** Unless otherwise specified, all materials and equipment required for the Work must be new, free from defects, and of the best grade for the intended purpose, and furnished in sufficient quantities to ensure the proper and expeditious performance of the Work. Contractor must employ measures to preserve the specified quality and fitness of the materials and equipment. Unless otherwise specified, all materials and equipment required for the Work are deemed to include all components required for complete installation and intended operation, and must be installed in accordance with the manufacturer's recommendations or instructions. Contractor is responsible for all shipping, handling, and storage costs associated with the materials and equipment required for the Work, and is responsible for providing security and protecting the Work and all of the required materials, supplies, tools and equipment at Contractor's sole cost until City has formally accepted the Project as set forth in Section 11.1 below. Contractor will not assign, sell, mortgage, or hypothecate any materials or equipment for the Project, or remove any materials or equipment that have been installed or delivered.

(B) ***City-Provided.*** If the Work includes installation of materials or equipment to be provided by City, Contractor is solely responsible for the proper examination, handling, storage, and installation of such items in accordance with the Contract Documents. Contractor must promptly notify City of any defects discovered in City-provided materials or equipment. Contractor is solely responsible for any loss of or damage to such items which occurs while the items are in Contractor's custody and control, the cost of which may be offset from the Contract Price and deducted from any payment(s) due to Contractor.

(C) **Existing City Equipment.** Contractor will carefully remove all existing equipment from the Worksite. If the City specifies or indicates that equipment is to be salvaged and reused or to remain the property of City then the Contractor will reuse or return the equipment to the City. Contractor will store and protect salvaged equipment specified to be reused in the Work. Contractor will delivery to the City in good condition the equipment that is to remain City property but not be reused in the Work.

(1) If an item specified to be salvaged is damaged during its removal, storage, or handling through carelessness or improper procedures, then Contractor will replace that equipment in kind or with a new item. For those items specified to be salvaged Contractor may choose to instead furnish and install new equipment, in which case the original, removed items will become Contractor's property. Existing materials and equipment removed by Contractor will only be reused in the Work if so specified or indicated by the City.

(D) ***Intellectual Property Rights.*** Contractor must, at its sole expense, obtain any authorization or license required for use of patented or copyright protected materials, equipment, devices or processes that are incorporated into the Work. Contractor's indemnity obligations in Article 4 applies to any claimed violation of intellectual property rights in violation of this provision.

(E) ***Certificate of Compliance.*** When a Certificate of Compliance is specified, or for any material or item ("material") produced or assembled outside of the United States, Contractor must submit a Certificate of Compliance before incorporating that material into the Project. A Certificate of Compliance must be submitted for each lot of material delivered to the Project site, and in a form acceptable to the Engineer, identifying the material, its source, and the lot. Each Certificate of Compliance must be signed by the material producer stating that the material fully complies with the applicable requirements of the Specifications. Submission of a Certificate of Compliance will not limit Contractor's continuing obligation to use only materials that conform with the requirements of the Contract Documents. Any materials furnished pursuant to a Certificate of Compliance may be inspected or tested at any time by City, subject to the inspection and testing provisions of Article 7, and defective or non-conforming material may be rejected at any time, even if already installed.

(F) ***Site Materials.*** Except as otherwise specified, City retains full ownership of and all rights to use any water, soil, stone, gravel, sand, minerals or other materials ("Site Materials") on City property, including the Project site, and including any site materials that have been extracted, excavated, or otherwise affected or made accessible by performance of the Work. However, City, acting in its sole discretion, may provide written authorization in the Specifications or in a Change Order for Contractor to make use of or incorporate specified Site Materials in the Work.

7.7 Substitutions.

(A) ***"Or Equal."*** Any Specification designating a material, product, or thing (collectively, "item") or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate the quality and type of item or service desired, and Contractor may request use of any equal item or service.

(B) ***Request for Substitution.*** A request for substitution of an item or service must be submitted in writing to the Engineer for approval in advance, within the applicable time period provided in the Contract Documents. If no time period is specified, the substitution request may be submitted any time within 35 days after the date of award of the Contract, or sufficiently in advance of the time needed to avoid delay of the Work, whichever is earlier. The request must be submitted on the City's Substitution Request Form.

(C) ***Substantiation.*** Any available data substantiating the proposed substitute as an equal item or service must be submitted with the written request for substitution. Contractor's failure to timely provide all necessary substantiation, including any required test results as soon as they are available, is grounds for rejection of the proposed substitution, without further review.

(D) ***Burden of Proving Equality.*** Contractor has the burden of proving the equality of the proposed substitution at Contractor's sole cost, including testing using methods acceptable to City. City has sole discretion to determine whether a proposed substitution is equal, and City's determination is final.

(E) ***Approval or Rejection.*** If the proposed substitution is approved, Contractor is solely responsible for any additional costs or time associated with the substituted item or service. If the proposed substitution is rejected, Contractor must, without delay, install the item or use the service as specified by City.

(F) ***Contractor's Obligations.*** City's approval of a proposed substitution will not relieve Contractor from any of its obligations under the Contract Documents. In the event Contractor makes an unauthorized substitution, Contractor will be solely responsible for all resulting cost impacts, including the cost of removal and replacement and the impact to other design elements.

7.8 Inspection and Testing.

(A) ***General.*** All materials, equipment, and workmanship used in the Work are subject to inspection and testing by City at all times and locations during construction and/or fabrication and at any Work site, including at shops and yards as well as at the Project site, or at the plant of a manufacturer of materials or items to be incorporated into the Work. All manufacturers' application or installation instructions must be provided to the Inspector at least ten days prior to the first such application or installation. Contractor must, at all times, make the Work available for inspection.

(B) ***Scheduling and Notification.*** Contractor must cooperate with City in coordinating the inspections and testing. Contractor must submit samples of materials, and schedule all tests required by the Contract Documents in time to avoid any delay to the progress of the Work. Contractor must notify the Engineer in writing no later than two Working Days before any inspection or testing is being requested, and must provide timely notice to the other necessary parties as specified in the Contract Documents. If Contractor schedules an inspection or test beyond regular Work hours, or on a Saturday, Sunday, or recognized City holiday, Contractor must seek, in writing, Engineer's approval at least two Working Days in advance. If approved, Contractor must reimburse City for the cost of the overtime inspection or testing. Such costs, including the City's hourly costs for required personnel and Inspector, may be deducted from payments otherwise due to Contractor.

(C) ***Responsibility for Costs.*** City will bear the initial cost of inspection and testing to be performed by independent inspections and/or testing consultants retained by City, subject to the following exceptions:

(1) Contractor will be responsible for the costs of any subsequent inspections and/or tests which are required to substantiate compliance with the Contract Documents, and any associated remediation costs.

(2) Contractor will be responsible for inspection and testing costs, at the rate charged by the consultant retained by the City to provide inspection and testing services, and for inspection and testing time lost because the Work is not ready or Contractor fails to appear for a scheduled inspection.

(3) If any portion of the Work that is subject to inspection or testing is covered or concealed by Contractor prior to the inspection or testing, Contractor will bear the cost of making that portion of the Work available for the inspection or testing

required by the Contract Documents, and any associated repair or remediation costs.

(4) Contractor is responsible for properly shoring all compaction test sites deeper than five feet below grade, as required under Section 7.15 below.

(5) Any Work or material that is defective or fails to comply with the requirements of the Contract Documents must be promptly repaired, removed, replaced, or corrected by Contractor, at Contractor's sole expense, even if that Work or material was previously inspected or included in a progress payment.

(D) ***Contractor's Obligations*.** All Work and materials must conform with the lines, grades, typical cross sections, dimensions, material requirements, and tolerances shown or described by the Drawings and Specifications. City, acting in its sole discretion, will determine whether Work or materials conform with the Drawings and Specifications, including allowable deviations. City's determination as to conformity or allowable deviations is final. Contractor is solely responsible for any delay occasioned by remediation of defective or noncompliant Work or material. Inspection of the Work does not in any way relieve Contractor of its obligations to perform the Work as specified. Any Work done without the required inspection(s) will also be subject to rejection by City.

(E) ***Distant Locations.*** If required off-site testing or inspection must be conducted at a location more than 100 miles from the Project site, Contractor is solely responsible for the additional travel costs required for testing and/or inspection at such locations.

(F) ***Plant Inspection.*** If specified in the Contract Documents, or upon written request by City, Contractor must use its best efforts to facilitate and arrange for City's inspection, sampling or testing of materials or items required for the Work at the plant or facility from which the materials or items are to be obtained. Contractor's best efforts must include contacting the producer or manufacturer on a timely basis to schedule inspection by City's selected representative, including appropriate access and any safety equipment, all at no cost to City. The inspection must be scheduled sufficiently in advance of the planned shipping or production date to allow for alternative arrangements if the City determined that the materials or items do not meet the requirements of the Drawings and Specifications. Nothing in this provision obligates City to inspect materials or items at the source plant or facility.

(G) ***Final Inspection.*** The provisions of this Section 7.8 apply to final inspection under Article 11, Completion and Warranty Provisions.

7.9 Worksite Conditions and Maintenance. Contractor must at all times, on a 24-hour basis and at its sole cost, maintain the Project site and staging and storage areas in clean and neat condition and in compliance with all regulatory requirements for air quality and dust control. Contractor must also, on a daily basis and at its sole cost, remove and properly dispose of the debris and waste materials from the Project site. Project site maintenance expenses are deemed to have been included in Contractor's Bid Proposal.

(A) ***Protection of Existing Property, Structures, and Utilities***. If the Drawings indicate existing above-grade and below-grade structures, drainage lines, storm drains, sewers, water, gas, electrical, phone and data cable, and other similar items or utilities known to the City, then Contractor will locate these known existing installations before proceeding with trenching or other operations which may cause damage, will maintain them in service where appropriate, and will repair any damage caused to them by the Work, at no increase in the Contract Price.

(1) The Contractor may temporarily mark or paint the ground, pavement, sidewalk, or any other improvements, but must not do so in a public right-of-way or on the Site more than 30 days prior to the commencement of excavation work performed in connection with an installation. Any mark or paint must be removed from all surfaces, including any decorative work, within 30 days of the completion of the excavation work. The Contractor is responsible for any expense associated with damages caused by the Contractor's mark or paint, including the removal thereof.

(2) The Contractor will record the location and existence of pavement markers and striping prior to construction, and will provide such records to the Engineer. The Contractor will replace in kind any permanent paving marker or striping that it removes or damages, or as marked in the Plans, at its expense.

(B) ***Air Emissions Control***. Contractor must not discharge smoke or other air contaminants into the atmosphere in violation of any applicable law, regulation or rule.

(C) ***Dust and Debris***. Contractor must minimize and confine dust and debris resulting from the Work. Contractor must abate dust nuisance by cleaning, sweeping, and immediately sprinkling with water excavated areas of dirt or other materials prone to cause dust, and within one hour after the Engineer notifies Contractor that an airborne nuisance exists. The Engineer may direct that Contractor provide an approved water-spraying truck for this purpose. If the Engineer determines that the dust control is not adequate, City may have the work done by others and deduct the cost from the Contract Price. Contractor will immediately remove any excess excavated material from the Worksite and any dirt deposited on public streets.

(D) ***Clean up.*** Before discontinuing Work in an area, Contractor must clean the area and remove all rubbish and debris along with the construction equipment, tools, machinery, waste and surplus materials.

(1) Except as otherwise specified, all excess Project materials, and the materials removed from existing improvements on the Project site with no salvage value or intended reuse by City, will be Contractor's property.

(2) Hauling trucks and other vehicles leaving the Project site must be cleaned of exterior mud or dirt before traveling on City streets. Materials and loose debris must be delivered and loaded to prevent dropping materials or debris. Contractor must immediately remove spillage from hauling on any publicly traveled way. Streets affected by Work on the Project must be kept clean by street sweeping.

(E) ***Disposal.*** Contractor must dispose of all Project debris and waste materials in a safe and legal manner. Contractor may not burn or bury waste materials on the Project site. Contractor will not allow any dirt, refuse, excavated material, surplus concrete or mortar, or any associated washings, to be disposed of onto streets, into manholes or into City's storm drain system.

(F) ***Completion.*** At the completion of the Work, Contractor must remove from the Worksite all of its equipment, tools, surplus materials, waste materials and debris, presenting a clean and neat appearance. Before demobilizing from the Worksite, Contractor must ensure that all surfaces are cleaned, sealed, waxed, or finished as applicable, and that all marks, stains, paint splatters, and the like have been properly removed from the completed Work and the surrounding areas. Contractor must ensure that all parts of the construction are properly joined with the previously existing and adjacent improvements and conditions. Contractor must provide all cutting, fitting and patching needed to accomplish that requirement. Contractor must also repair or replace

all existing improvements that are damaged or removed during the Work, both on and off the Project site, including curbs, sidewalks, driveways, fences, signs, utilities, street surfaces and structures. Repairs and replacements must be at least equal to the previously existing improvements, and the condition, finish and dimensions must match the previously existing improvements.

(G) ***Non-Compliance.*** If Contractor fails to comply with its maintenance and cleanup obligations or any City clean up order, City may, acting in its sole discretion, elect to suspend the Work until the condition(s) is corrected with no increase in the Contract Time or Contract Price, or undertake appropriate cleanup measures without further notice and the cost will be deducted from any amounts due or to become due to Contractor.

7.10 Instructions and Manuals. Contractor must provide to City two bound copies and an electronic PDF copy of each of all instructions and manuals required by the Contract Documents, unless otherwise specified. These must be complete as to drawings, details, parts lists, performance data, and other information that may be required for City to easily maintain and service the materials and equipment installed for this Project.

(A) ***Submittal Requirements.*** All manufacturers' application or installation instructions must be provided to City at least ten days prior to the first such application. The instructions and manuals, along with any required guarantees, must be delivered to City for review.

(B) ***Training.*** Contractor or its Subcontractors must instruct City's personnel in the operation and maintenance of any complex equipment as a condition precedent to Final Completion, if required in the Contract Documents.

7.11 As-built Drawings. Contractor and its Subcontractors must prepare and maintain at the Project site a detailed, complete and accurate as-built set of the Drawings which will be used solely for the purpose of recording changes made in any portion of the original Drawings in order to create accurate record drawings at the end of the Project.

(A) ***Duty to Update.*** The as-built drawings must be updated as changes occur, on a daily basis if necessary. Progress payments may be delayed, in whole or in part, until the as-built drawings are brought up to date to the satisfaction of City. Actual locations to scale must be identified on the as-built drawings for all runs of mechanical and electrical work, including all site utilities installed underground, in walls, floors, or otherwise concealed. Deviations from the original Drawings must be shown in detail. The exact location of all main runs, whether piping, conduit, ductwork or drain lines, must be shown by dimension and elevation. The location of all buried pipelines, appurtenances, or other improvements must be represented by coordinates and by the horizontal distance from visible above-ground improvements.

(B) ***Final Completion.*** Contractor must verify that all changes in the Work are depicted in the as-built drawings and must deliver the complete set of as-built drawings to the Engineer for review and approval as a condition precedent to Final Completion and Final Payment.

7.12 Existing Utilities. As required by Government Code section 4215, if, during the performance of the Work, Contractor discovers utility facilities not identified by City in the Contract Documents, Contractor must immediately provide written notice to City and the utility. City assumes responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Project site if those utilities are not identified in the Contract Documents. Contractor will be compensated in accordance with the provisions of the Contract Documents for the costs of locating, repairing damage not due to Contractor's failure to exercise reasonable care, and removing or relocating such

utility facilities not indicated in the Drawings or Specifications with reasonable accuracy, and for equipment on the Project necessarily idled during such work. Contractor will not be assessed liquidated damages for delay in completion of the Work, to the extent such delay was caused by City's failure to provide for removal or relocation of the utility facilities.

7.13 Notice of Excavation. Contractor must comply with all applicable operator requirements in Government Code sections 4216 through 4216.5. Government Code section 4216.2 requires that, except in an emergency, Contractor must contact the appropriate regional notification center, or Underground Services Alert, at least two working days but not more than 14 calendar days before starting any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations, and, if practical, Contractor must delineate with white paint or other suitable markings the area to be excavated. Contractor may not begin excavation until it has obtained and submitted to Engineer an inquiry identification number from Underground Services Alert.

7.14 Trenching and Excavations of Four Feet or More. As required by Public Contract Code section 7104, if the Work includes digging trenches or other excavations that extend deeper than four feet below the surface, the following provisions in this Section apply to the Work and the Project.

(A) ***Duty to Notify.*** Contractor must promptly, and before the following conditions are disturbed, provide written notice to City if Contractor finds any of the following conditions:

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

(2) Subsurface or latent physical conditions at the Worksite differing from those indicated by information about the Worksite made available to bidders prior to the deadline for submitting bids; or

(3) Unknown physical conditions at the Worksite of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in work of the character required by the Contract Documents.

(B) ***City Investigation.*** City will promptly investigate the conditions and if City finds that the conditions do materially differ or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, City will issue a Change Order.

(C) ***Disputes.*** In the event that a dispute arises between City and Contractor regarding any of the conditions specified in subsection (A) above, Contractor will not be excused from completing the Work within the Contract Time, but must proceed with all Work to be performed under the Contract. Contractor will retain any and all rights provided either by the Contract or by law which pertain to the resolution of disputes between Contractor and City.

7.15 Trenching of Five Feet or More. As required by Labor Code section 6705, if the Contract Price exceeds $25,000 and the Work includes the excavation of any trench or trenches of five feet or more in depth, a detailed plan must be submitted to City for acceptance in advance of the excavation. The detailed plan must show the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the

hazard of caving ground during the excavation. If the plan varies from the shoring system standards, it must be prepared by a California registered civil or structural engineer. Use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders is prohibited.

7.16 New Utility Connections. City will pay connection charges and meter costs for new permanent utilities required by the Contract Documents, if any. Contractor must notify City sufficiently in advance of the time needed to request service from each utility provider so that connections and services are initiated in accordance with the Project schedule.

7.17 Lines and Grades. Contractor is required to use any benchmark provided by the Engineer. Unless otherwise specified in the Contract Documents, Contractor must provide all lines and grades required to execute the Work. Contractor must also provide, preserve, and replace if necessary, all construction stakes required for the Project. All stakes or marks must be set by a California licensed surveyor or a California registered civil engineer. Contractor must notify the Engineer of any discrepancies found between Contractor's staking and grading and information provided by the Contract Documents. Upon completion, all Work must conform to the lines, elevations, and grades shown in the Plans.

7.18 Historic or Archeological Items.

(A) ***Contractor's Obligations.*** Contractor must ensure that all persons performing Work at the Project site are required to immediately notify the Project Manager, upon discovery of any potential historic or archeological items, including historic or prehistoric ruins, a burial ground, archaeological or vertebrate paleontological site, including fossilized footprints or other archeological, paleontological or historical feature on the Project site (collectively, "Historic or Archeological Items").

(B) ***Discovery; Cessation of Work.*** Upon discovery of any potential Historic or Archeological Items, Work must be stopped within an 85-foot radius of the find and may not resume until authorized in writing by City. If required by City, Contractor must assist in protecting or recovering the Historic or Archeological Items, with any such assistance to be compensated as Extra Work on a time and materials basis under Article 6, Contract Modification. Any suspension of Work required due to discovery of Historic or Archeological Items will be treated as a suspension for convenience under Article 13.

7.19 Recycling and Waste Disposal.

(A) ***Approved Recycling Facility.*** Contractor must dispose of all recyclable materials at a recycling facility approved by the Engineer.

(B) ***Inert Solids and Plant Materials.*** Contractor must remove all asphalt concrete, Portland cement concrete, aggregate base material, inert solids and any plant material from the Project site and deposit at an approved recycling facility. Contractor must conform the above material to an acceptable size and composition for recycling.

(C) ***Recyclable Materials.*** Contractor must recycle at least 65% of all materials at an approved recycling facility.

(D) ***Waste Management Plan and Disposal Report.*** If the California Green Building Standards Code applies to the Project, Contractor must submit to the City a waste management plan prior to starting work. A disposal report is required upon completion of the Project, for materials that are hauled by Contractor or by the City's franchised hauler. If a waste management plan is required it must be available

throughout the duration of the Project for examination by the City. Electronic submittals are acceptable. The waste management plan must include the following:

(1) Project title and number;

(2) Identify the construction methods that will be employed to reduce waste;

(3) Type of material(s) to be recycled, salvaged or landfilled;

(4) Specify if the waste will be sorted onsite or bulk-mixed; and

(5) Name and address of recycling facilit(ies) and landfill(s) to be used;

The disposal report must include the following:

(1) Project title;

(2) Date and time of disposal;

(3) Truck number;

(4) Type of material recycled, salvaged, or landfilled;

(5) Weight of material recycled, salvaged, or landfilled;

(6) Name and address of recycling facility or landfill;

(7) Certification or weight tags from facility;

(8) Weight tags for all material landfilled; and

(9) If the recycling goal is not met, provide an explanation, to be approved by City, for why it was not met.

(E) ***Collection of Waste and Debris.*** Collection of garbage, mixed non-organic recyclables, organic waste, and any construction or demolition materials in debris boxes, compactors, or bin-by-the-day services that are not City franchisees or otherwise agents of the City is prohibited. Notwithstanding the above, Contractor must dispose of debris from the Project in one of the following:

(1) Franchised hauler bin;

(2) A bin owned by Contractor or a demolition Subcontractor provided that it is hauled by an employee of the Contractor or the demolition Subcontractor and by a vehicle owned and registered to the Contractor or the demolition Subcontractor; or

(3) Private truck with a bed.

(F) **Recycling Containers.** The disposal of garbage in containers designated for compostable waste recycling is prohibited.

7.20 Storm Water Pollution Control

(A) ***Storm Drains.*** Contractor will comply with all state and federal storm water regulations. Contractor will not allow any waste materials or pollutants to enter the storm drainage system.

(B) ***Best Management Practices.*** Contractor must remove any waste found or generated at the Project site using the appropriate Best Management Practices (BMPs), and must properly dispose of the waste or pollutants off-site. If solid or liquid waste materials or pollutants from the Project enter the storm drain system, Contractor must immediately notify the City's Environmental Services Division, and thoroughly clean up the affected catch basins, storm sewer, and storm manholes to the satisfaction of the Engineer. If Contractor fails to meet the requirements of this section, the City may issue a stop-work notice and take necessary action to require Contractor to set up preventive measures or clean up the storm drainage system. Contractor will bear all costs related to the stop-work action and corrective work, and will not be entitled to an extension of the Contract time for any resulting delay.

(C) ***Stormwater Permit.*** Contractor must control all water pollution pursuant to the Contract Documents, the State Water Resources Control Board National Pollutant Discharge Elimination System ("NPDES") General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities ("Stormwater Permit"). If required for the Work, a copy of the Stormwater Permit is on file in City's principal administrative offices, and Contractor must comply with the same without adjustment of the Contract Price or the Contract Time. Contractor must timely and completely submit required reports and monitoring information required by the conditions of the Stormwater Permit. Contractor also must comply with all other applicable state, municipal or regional laws, ordinances, rules or regulations governing discharge of stormwater, including applicable municipal stormwater management programs.

(D) ***Failure to Comply with Stormwater Permit.*** Contractor must pay all costs and liabilities imposed by law as a result of Contractor's failure to comply with the provisions set forth in the Contract Documents. Such costs and liabilities include, but are not limited to, fines, penalties, and damages, whether assessed against the City or Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

(E) ***Storm Water Pollution Prevention Plan Preparation.*** Contractor must incorporate the following BMPs, as applicable, into a site-specific Storm Water Pollution Prevention Plan (SWPPP) if required for this Project. The SWPPP must be approved by the Engineer prior to construction.

(1) *Non Hazardous Material/Waste Management.*

a. Contractor must designate areas of the Project site suitable for material delivery, storage, and waste collection that, to the maximum extent practicable, are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.

b. Contractor must store granular material at least 10 feet away from catch basin and curb returns.

c. Contractor must prevent granular material to enter the storm drains or creeks.

d. During wet weather and when rain is forecast in the next 24 hours, Contractor must cover granular material with a tarpaulin and surround the material with sand bags or other weights to ensure that tarpaulin does not expose the material during wind and rain.

e. Contractor will use minimal amounts of water to control dust on a daily basis or as directed by the Engineer.

f. At the end of each working day or as directed by the City, Contractor must clean and sweep roadways and on-site paved areas of all materials on or adjacent to the Worksite.

g. Throughout the working day and at the end of each working day, or as directed by the City, Contractor must pick up litter, trash, scrap, waste material, and debris from the Project site and any adjacent sidewalk, curb, and gutter area. Contractor must keep the site and perimeter free from cigarette butts and other litter.

h. Contractor must ensure that lids for trash receptacles are kept closed and that trash receptacles are maintained in a manner that prevents overflows.

i. Contractor must maintain a clean and litter-free area around all trash receptacles on the site.

j. Contractor will not use water to flush down streets in place of street sweeping or other dry methods of spill cleanup such as applying absorbent, sweeping up material and disposing it in a waste bin.

k. In addition to Contractor's obligation to recycle materials pursuant to Section 7.19 of the General Conditions, Contractor must, to the maximum extent practicable, reuse or recycle any useful construction materials generated during the Project.

l. Contractor must inspect any waste and recycling receptacles for leaks, and must contact the City's trash hauling franchisee to immediately replace or repair any leaking receptacles.

m. Contractor will not discharge water on-site as a result of cleaning recycling or trash receptacles.

n. Contractor must arrange for regular waste collection before receptacles overflow, and must adjust the frequency of service or the receptacle size as needed to ensure that overflows do not occur.

(2) *Hazardous Material/Waste Management.*

a. Contractor must label and store all hazardous materials including but not limited to pesticides, paints, thinners, solvents, and fuels; and all hazardous wastes, including but not limited to waste oil and antifreeze; in accordance with the City's Hazardous Materials Storage Ordinance and all applicable state and federal regulations.

b. Contractor must keep an accurate, up-to-date inventory, including Materials Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on-site.

c. When rain is forecast within 24 hours or during wet weather, the Contractor must not apply chemicals such as pesticides and cleaners, or any materials that may potentially enter the storm drain system, in outside areas.

d. Contractor must not over-apply pesticides or fertilizers and must follow materials manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals. Over-application of a pesticide constitutes a "label violation" subject to an enforcement action by the Santa Clara County Agriculture Department.

e. Contractor must arrange for regular hazardous waste collection to comply with all applicable time limits on storage of hazardous wastes.

f. Contractor must dispose of hazardous waste only at authorized and permitted treatment, storage and disposal facilities, and must use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in state and federal regulations.

g. If Contractor's business office is located in Santa Clara County, Contractor may dispose of this waste through the Countywide Hazardous Waste Program. Businesses generating less than 27 gallons or 220 pounds of hazardous waste per month are legally classified as conditionally exempt small quantity generators (CESQGs). Information on the CESQG program may be requested by calling the County at (408) 299-7300.

(3) *Spill Prevention and Control.*

a. Contractor must keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site.

b. Contractor must immediately contain and prevent leaks and spills from entering storm drains, and properly clean up and dispose of the waste and cleanup materials, using dry methods to the extent feasible. If the waste is hazardous, Contractor must handle the waste as described in subsection (2) above.

c. Contractor will not wash any spilled material into streets, gutters, storm drains, or creeks and will not bury spilled hazardous materials.

d. Contractor must report any hazardous materials spill by calling 911 and must notify the City's Public Works Environmental Division at 408-777-3354.

(4) *Vehicle/Equipment Cleaning.*

a. Contractor will not perform vehicle or equipment cleaning on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods.

b. Contractor must perform vehicle or equipment cleaning, with water only, in a designated, bermed, pervious area that will not allow rinse water to run offsite or into streets, gutters, storm drains, or creeks.

(5) *Vehicle/Equipment Maintenance and Fueling.*

a. Contractor will not perform maintenance and fueling of vehicles onsite.

b. Contractor must perform maintenance and fueling of equipment only when necessary, and in a designated, bermed area or over a drip pan that will not allow run-on of storm water or runoff of spills.

c. Contractor must use secondary containment, such as a drip pan, to catch leaks or spills any time that equipment fluids are dispensed, changed, or poured.

d. Contractor must keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site to clean up drips and spills.

e. Contractor must clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described above.

f. Contractor will not wash any spilled material into streets, gutters, storm drains, or creeks and shall not bury spilled hazardous materials.

g. Contractor must report any hazardous materials spill by calling 911. After the emergency has been reported, Contractor must notify the City's Public Works Environmental Division.

h. Contractor must inspect vehicles and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans must be used to catch leaks until repairs are made. Shut-off valves on equipment must be working properly.

i. Contractor must comply with federal, state and City requirements for above-ground storage tanks.

(6) *Contractor Training and Awareness.*

a. Contractor must train all employees and Subcontractors on the SWPPP requirements contained in these General Conditions.

b. Contractor must include appropriate provisions in its subcontracts to ensure that these SWPPP requirements are met.

c. Contractor must post warning signs in areas treated with chemicals.

d. Contractor must paint City-approved stencil or, preferably, apply steel medallions to, any new catch basins with the "No Dumping, Flows to Creek" stencil or medallion markers available from the City's Public Works Environmental Division.

(7) *Activity-Specific Requirements.* The following requirements apply if the Project includes the listed activities.

a. Dewatering or Pumping Operations.

(i) Contractor must not discharge water to the storm drain system. Water discharges must be directed to a pervious, landscaped, or bioretention area where water will be infiltrated without causing runoff, or routed to the sanitary sewer system after obtaining a permit from Cupertino Sanitary District or Sunnyvale Sanitary, depending on which has jurisdictional authority, or contained using a Baker tank or other means to collect the water for re-use or safe and legal disposal. Contractor may contact the City's Environmental Division for more information on these control measures.

(ii) Contractor must obtain approval of the Engineer for any control measure in advance.

(iii) Contractor must reuse water for other needs, including but not limited to dust control or irrigation, to the maximum extent practicable.

b. Paving Operations.

(i) When rain is forecast within 24 hours or during wet weather, the Engineer may require that paving be delayed for more suitable conditions.

(ii) The Engineer may direct Contractor to protect drainage courses by using control measures, including but not limited to, earth dike, straw bale, and sand bag, to divert runoff or trap and filter sediment. Contractor must refer to California Storm Water Best Management Practice Handbook for these control measures.

(iii) Contractor must place drip pans or absorbent material under paving equipment when not in use.

(iv) Contractor must securely cover catch basins and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.

(v) Contractor must remove, clean and reapply or replace catch basin covers as often as needed to ensure protection of the storm drain system from any material other than rain.

(vi) Before Final Completion, Contractor must remove and dispose of all catch basin covers and material trapped by the covers. If Contractor fails to remove and dispose of the covers and materials trapped, City reserves the right to delay final inspection and/or deduct monies from payments due Contractor to compensate the City for its additional costs for removal and disposal of catch basin protection (BMPs).

(vii) If the paving operation includes an on-site mixing plant, Contractor must comply with Santa Clara County General Industrial Activities Storm Water Permit requirements.

(viii) Contractor must preheat, transfer or load hot bituminous material away from drainage systems or watercourses.

(ix) Contractor will not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into streets, gutters, storm drains, or creeks. Contractor must either collect the sand and return it to the stockpile, or dispose of it in a trash container. Contractor will not use water to wash down fresh asphalt concrete pavement.

c. Saw Cutting.

(i) Contractor must use as little water as possible during saw cutting and grinding operations.

(ii) Contractor must cover or barricade catch basins using control measures, including but not limited to as filter fabric, straw bales, sand bags, and fine gravel dams, to keep slurry out of the storm drain system. When protecting a catch basin, Contractor must ensure that the entire opening is covered. Contractor must refer to California Storm Water Best Management Practice Handbook for these control measures.

(iii) Contractor must remove, clean and reapply or replace catch basin covers.

(iv) Before Final Completion, Contractor must remove and dispose of all catch basin covers.

(v) Contractor must shovel, absorb or vacuum saw cut slurry and pick up the waste prior to moving to the next location or at the end of each working day, whichever is sooner.

(vi) If saw cut slurry enters catch basins, Contractor must remove the slurry from the storm drain system immediately.

d. Traffic Detector Loop Installation and Repair.

(i) Contractor must protect nearby storm drain inlets prior to cutting or flushing slot for traffic detector loops. Contractor must block or berm around nearby storm drain inlets using sand bags or an equivalent barrier or use absorbent materials such as pads, pillows and socks to contain slurry.

(ii) Before Final Completion, Contractor must remove all sand bags and equivalent barriers and absorbent materials from the site and sweep the area clean and away from the storm drain inlet.

(iii) Contractor must clean up residues by sweeping up as much material as possible and must dispose of material properly.

e. Concrete, Grout and Mortar Waste Management.

(i) Contractor must avoid mixing excess amounts of fresh concrete or cement mortar on-site.

(ii) Contractor must store concrete, grout and mortar away from drainage areas and ensure that these materials do not enter the storm drain system.

(iii) Contractor will not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks.

(iv) Contractor must perform washout of concrete trucks or equipment off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. Contractor must let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, Contractor must collect the wash water and remove it off-site.

(v) Contractor will prevent creating runoff by draining water from washing of exposed aggregate concrete to a dirt area. If a suitable dirt area is not available, Contractor must collect the wash water and remove it off-site.

(vi) Before Final Completion, Contractor must remove all protective measures and treatment materials and sweep the site clean.

(vii) Contractor must collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in a trash container.

f. Painting.

(i) Contractor must conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or runoff of spills.

(ii) Contractor will not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drains or creeks.

(iii) Contractor will remove as much excess paint as possible from brushes, rollers and equipment before starting cleanup.

(iv) To the maximum extent practicable and with permission from Cupertino Sanitary District, Contractor will dispose of wash water from aqueous cleaning of equipment and tools to the sanitary sewer.

(v) If Contractor cannot dispose of wash water to the sanitary sewer, Contractor must direct wash water onto dirt area and spade in.

(vi) To the maximum extent practicable, Contractor will filter paint thinner and solvents for reuse.

(vii) Contractor must dispose of thinners, solvents, oil and water-based paint, and sludge from cleaning of equipment and

tools as hazardous waste, as described in these General Conditions.

(viii) Contractor must store paint, solvents, chemicals, and waste materials in compliance with the City of Cupertino Hazardous Materials Storage Ordinance and all applicable state and federal regulations. Contractor must store these materials in a designated area that will not allow run-on of storm water or runoff of spills.

(ix) Contractor must dispose of dry or empty paint cans and buckets, old brushes, rollers, rags, and drop cloths in the trash.

g. Earthwork.

(i) Contractor must use the BMPs for erosion and sedimentation in either the California Storm Water Best Management Practice Handbook - Construction Activity or the ABAG Manual of Standards for Erosion and Sediment Control Measures.

h. Thermoplastic.

(i) Contractor must transfer and load hot thermoplastic away from drainage systems or watercourses.

(ii) Contractor must sweep thermoplastic grindings into plastic bags. Yellow thermoplastic grindings may require special handling as they may contain paint.

i. Pesticide Usage and Pest Management.

(i) Contractor must follow all federal, state, and local policies (including the City's Integrated Pest Management Policy), laws, and regulations governing the use, storage, and disposal of pesticides and training of pest control advisors and applicators.

(ii) Contractor must submit pest management control methods to Engineer for approval. Such control methods may include, but are not limited to: no controls; physical or mechanical methods; environmental controls (mulching, pest-resistant vegetation); biological controls (predators, parasites, etc.); less toxic controls (soaps, oils, etc.); and hot water.

(iii) Contractor must notify and receive permission from the Engineer and the Public Works Environmental Division before applying any pesticides.

(iv) If permitted to use pesticides, Contractor must use the least toxic pesticides available and the use and type of such pesticides must be approved by the City. The City will consider the LD50, overall risk to the applicator, and impact to the environment when approving the use of pesticides.

(v) Contractor must apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides in stormwater runoff. Contractor will not apply pesticides if rain is expected.

(vi) Contractor must mix and apply only as much material as is necessary for treatment. Contractor must calibrate application equipment prior to and during use to ensure desired application rate.

(vii) Contractor will not mix or load pesticides in application equipment adjacent to a storm drain inlet culvert or watercourse.

(viii) Contractor will not use Clopyralid, Diazinon, Chlorpyrifos, Chloradane, DDT, Dieldrin or other organophosphates. Fipronil and pyrethroids including, but not limited to Deltamethrin and Bifenthrin, will not be applied on City property.

(ix) Contractor must submit monthly summaries of pesticide use to the Public Works Environmental Division on appropriate City form. Information provided must include, at a minimum, the product used, the method of application, date applied, the area to which it is applied, and the amount applied.

7.21 Traffic Control and Public Safety

A. ***Fences and Barriers.*** Contractor must furnish, erect, and maintain fences, barriers, lights, and signs, and must provide flagging and guards as necessary to give adequate warning to the public of the construction and of any dangerous condition at Contractor's sole cost and expense. City must approve all signs as to size, wording, and location. City, in its sole discretion, may direct Contractor to implement additional measures. Contractor may be required to cover certain signs which regulate or direct public traffic to roadways that are not open to traffic. The Engineer will determine which signs must be covered.

B. ***Manual on Uniform Traffic Control Devices (MUTCD).*** Notwithstanding the requirements of this Section 7.21, all fences, barriers, signs, lights, flags, and other warning and safety devices and their use must conform to the requirements of Part 6 of the United States Department of Transportation MUTCD and the MUTCD California Supplement.

C. ***Sign Conflicts.*** Signs and other protective devices furnished and erected by Contractor will not obscure the visibility of, nor conflict in intent, meaning, and function of, existing signs, lights, and traffic control devices or any construction area signs and traffic control devices

D. ***Public Access.*** Contractor must conduct operations in the manner that offers the least possible obstruction and inconvenience to the public. Contractor must complete the Work in a manner that allows for access to public rights-of-way. Unless otherwise provided in the Contract Documents, all public traffic must be permitted to pass through the Work with as little inconvenience and delay as possible. Where possible, public traffic must be routed on new or existing paved surfaces.

E. ***Public Spills.*** Spillage resulting from hauling operations along or across any public right-of-way must be removed immediately by Contractor at Contractor's sole cost and expense.

F. ***Existing Traffic Signals.*** Existing traffic signals and highway lighting must be kept in operation and available for routine maintenance during construction.

G. ***Abutting Properties.*** Construction operations must be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Contractor must maintain convenient access to driveways, houses, and buildings, and temporary approaches to crossings or intersecting highways must be provided and kept in good condition. When an abutting property owner's access across the right-of-way line is to be eliminated or replaced by other access facilities, the existing access will not be closed until the replacement access facilities are usable.

H ***Lane Closures.*** Lane closures are not permitted before 7:00 A.M. or after 5:00 P.M. from Monday through Friday or as otherwise specified in the Special Conditions or Specifications. City may, at its sole discretion, approve lane closures during this time upon written request from Contractor. Contractor must maintain a minimum of two travel lanes for traffic use (one in each direction) at all times.

I. ***Costs.*** Contractor is solely responsible for all costs for all required traffic control and public safety measures.

7.22 Noise Control. Contractor must comply with all applicable noise control laws, ordinances, regulations and rules. Noise control requirements apply to all equipment used for the Work or related to the Work, including trucks, transit mixers or transient equipment that may or may not be owned by Contractor.

7.23 Fire Protection Plan. If a fire protection plan is required for this Project, within 21 days after the date of issuance of the Notice of Award, Contractor must submit to the Engineer a fire protection plan that has been reviewed and approved by the Santa Clara County Fire Department. In addition to any specified requirements for the fire protection plan, the plan should address all of the following:

(A) Equipment spark arresters;

(B) Fire-extinguishing equipment at the Worksite(s);

(C) Fire response procedures;

(D) Notification to authorities of any fire;

(E) Fire equipment access during performance of the Work and after hours;

(F) Educating and training workers to comply with the fire protection plan

(G) Safe storage and transport of flammable materials; and

(H) Equipment for ventilation and illumination.

Article 8 - Payment

8.1 Schedule of Values. Prior to submitting its first application for payment, Contractor must prepare and submit to the Project Manager a schedule of values apportioned to the

various divisions and phases of the Work, including mobilization and demobilization. If a Bid Schedule was submitted with Contractor's bid, the amounts must be consistent with the Bid Schedule. Each line item contained in the schedule of values must be assigned a value such that the total of all items equals the Contract Price. The items must be sufficiently detailed to enable accurate evaluation of the percentage of completion claimed in each application for payment, and the assigned value consistent with any itemized or unit pricing submitted with Contractor's bid.

(A) ***Measurements for Unit Price Work.*** Materials and items of Work to be paid for on the basis of unit pricing will be measured according to the methods stipulated in the Contract Documents.

(B) ***Deleted or Reduced Work.*** Contractor will not be compensated for Work that City has deleted or reduced in scope, except for any labor, material or equipment costs for such Work that Contractor reasonably incurred before Contractor learned that the Work could be deleted or reduced. Contractor will only be compensated for those actual, direct and documented costs incurred, and will not be entitled to any mark up for overhead or lost profits.

8.2 Progress Payments. Following the last day of each month, or as otherwise required by the Special Conditions or Specifications, Contractor will submit to the Project Manager a monthly application for payment for Work performed during the preceding month based on the estimated value of the Work performed during that preceding month.

(A) ***Application for Payment.*** Each application for payment must be itemized to include labor, materials, and equipment incorporated into the Work, and materials and equipment delivered to the Worksite, as well as authorized and approved Change Orders. Each pay application must be supported by Contractor's Bid Schedule or schedule of values and any other substantiating data required by the Contract Documents.

(B) ***Payment of Undisputed Amounts.*** City will pay the undisputed amount due within thirty (30) days after Contractor has submitted a complete and accurate payment application, subject to Public Contract Code section 20104.50. City will deduct a percentage from each progress payment as retention, as set forth in Section 8.5, below, and may withhold additional amounts as set forth in Section 8.3, below.

8.3 Adjustment of Payment Application. City may adjust the amount requested, withhold disputed sums, or reject a payment application, including application for Final Payment, in whole or in part, or deduct or withhold from payment otherwise due based upon any of the circumstances and amounts listed below. Contractor will be notified in writing of the basis for the modification to the amount requested, and sums that have been withheld subject to performing contract requirements will be released when the basis for that withholding has been remedied and no longer exists.

(A) For Contractor's unexcused failure to perform the Work as required by the Contract Documents, including correction or completion of punch list items, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work;

(B) For loss or damage caused by Contractor or its Subcontractor(s) arising out of or relating to performance of the Work or any failure to protect the Worksite, City may deduct an amount based on the estimated cost to repair or replace;

(C) For Contractor's failure to pay its Subcontractors and suppliers when payment is due;

(D) For Contractor's failure to timely correct rejected, nonconforming, or defective Work, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work;

(E) For any unreleased stop notice, City may withhold 125% of the amount claimed;

(F) For Contractor's failure to submit any required schedule or schedule update in the manner and within the time specified in the Contract Documents, City may withhold or deduct an amount equal to five percent of the total amount requested;

(G) For Contractor's failure to maintain or submit as-built documents in the manner and within the time specified in the Contract Documents, City may withhold or deduct an amount based on the City's continued cost to prepare the as-builts;

(H) For Work performed without approved Shop Drawings, when approved Shop Drawings are required before proceeding with the Work, City may deduct an amount based on the estimated costs to correct unsatisfactory work or diminution in value;

(I) For fines assessed under the Labor Code;

(J) For any other costs or charges that may be withheld, deducted from, or offset against payments due, as provided in the Contract Documents, including liquidated damages; or

(K) For failure to release claims as to undisputed amounts pursuant to Section 8.9, below.

8.4 Early Occupancy. Neither City's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

8.5 Retention. City will retain five percent of the amount due on each progress payment, or the percentage stated in the Notice Inviting Bids, whichever is greater, as retention to ensure full and satisfactory performance of the Work.

(A) ***Substitution of Securities.*** As provided by Public Contract Code section 22300, Contractor may request in writing that it be allowed, at its sole expense, to substitute securities for the retention withheld by City. Any escrow agreement entered into pursuant to this provision must fully comply with Public Contract Code section 22300, and will be subject to approval as to form by City's legal counsel.

(B) ***Release of Undisputed Retention.*** All undisputed retention, less any amounts that may be assessed as liquidated damages, retained for stop notices, or otherwise withheld under Section 8.3 or Section 8.6, will be released as Final Payment to Contractor no sooner than 35 days following recordation of the notice of completion, and no later than 60 days following acceptance of the Project by City's governing body or authorized designee pursuant to Section 11.1(E) below, or, if the Project has not been accepted, no later than 60 days after the Project is otherwise considered complete under Public Contract Code section 7107(c).

8.6 Setoff. City is entitled to set off any amounts due from Contractor against any payments due to Contractor. City's entitlement to setoff includes progress payments as well as Final Payment and unreleased retention.

8.7 Payment to Subcontractors and Suppliers. Each month, Contractor must promptly pay each Subcontractor and supplier the value of the portion of labor, materials, and

equipment incorporated into the Work or delivered to the Worksite by the Subcontractor or supplier during the preceding month. Such payments must be made in accordance with the requirements of the law, and those of the Contract Documents and applicable subcontract or supplier contract.

(A) ***Withholding for Stop Notice.*** Pursuant to Civil Code section 9358, City will withhold 125% of the amount claimed by an unreleased stop notice, a portion of which may be retained by City for the costs incurred in handling the stop notice claim, including attorneys' fees and costs, as authorized by law.

(B) ***Joint Checks.*** City reserves the right to issue joint checks made payable to Contractor and its Subcontractors or suppliers. As a condition to release of payment by a joint check, the joint check payees may be required to execute a joint check agreement in a form provided or approved by City. The joint check payees will be jointly and severally responsible for the allocation and disbursement of funds paid by joint check. Payment by joint check will not be construed to create a contractual relationship between City and a Subcontractor or supplier of any tier beyond the scope of the joint check agreement.

8.8 Final Payment. Contractor's application for Final Payment must comply with the requirements for submitting an application for a progress payment as stated in Section 8.2, above. Corrections to previous progress payments, including adjustments to estimated quantities for unit priced items, may be included in the Final Payment. The date of Final Payment is deemed to be effective on the date that City acts to release undisputed retention as final payment to Contractor, or otherwise provides written notice to Contractor of Final Payment. If the amount due from Contractor to City exceeds the amount of Final Payment, City retains the right to recover the balance from Contractor or its sureties.

8.9 Release of Claims. City may, at any time, require that payment of the undisputed portion of any progress payment or Final Payment (excepting undisputed retention subject to release under Public Contract Code section 7107) be contingent upon Contractor furnishing City with a written waiver and release of all claims against City arising from or related to the portion of Work covered by those undisputed amounts subject to the limits of Public Contract Code section 7100. The waiver and release of claims must be submitted using the City's Release of Claims form. Any disputed amounts may be specifically excluded from the release.

8.10 Warranty of Title. Contractor warrants that title to all work, materials, or equipment incorporated into the Work or delivered to a Worksite, and included in a request for payment will pass over to City free of any claims, liens, or encumbrances upon any payment to Contractor pursuant to this Article 8.

Article 9 - Labor Provisions

9.1 Discrimination Prohibited. Discrimination against any prospective or present employee engaged in the Work on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status is strictly prohibited. Contractor and its Subcontractors are required to comply with all applicable federal and California laws, including the California Fair Employment and Housing Act (Government Code sections 12900 et seq.), Government Code section 11135, and Labor Code sections 1735, 1777.5, 1777.6, and 3077.5.

9.2 Labor Code Requirements.

(A) ***Eight Hour Day.*** Under Labor Code section 1810, eight hours of labor constitute a legal day's work under this Contract.

(B) ***Penalty.*** Under Labor Code section 1813, Contractor will forfeit to City as a penalty, the sum of $25.00 for each day during which a worker employed by Contractor or any Subcontractor is required or permitted to work more than eight hours in any one calendar day or more than 40 hours per calendar week, except if such workers are paid overtime under Labor Code section 1815.

(C) ***Apprentices.*** Contractor is responsible for compliance with the requirements governing employment and payment of apprentices, as set forth in Labor Code section 1777.5, which is fully incorporated by reference.

(D) ***Notices.*** Under Labor Code section 1771.4, Contractor is required to post all job site notices prescribed by law or regulation.

9.3 Prevailing Wages. Each worker performing Work under this Contract that is covered under Labor Code section 1720 or 1720.9, including cleanup at the Project site, must be paid at a rate not less than the prevailing wage as defined in sections 1771 and 1774 of the Labor Code. The prevailing wage rates are on file with the City and available online at http://www.dir.ca.gov/dlsr. Contractor must post a copy of the applicable prevailing rates at the Worksite.

(A) ***Penalties.*** Under Labor Code section 1775, Contractor and any Subcontractor will forfeit to City as a penalty up to $200.00 for each calendar day, or portion a day, for each worker paid less than the applicable prevailing wage rate. Contractor must also pay each worker the difference between the applicable prevailing wage rate and the amount actually paid to that worker.

(B) ***Federal Requirements.*** If this Project is subject to federal prevailing wage requirements in addition to California prevailing wage requirements, Contractor and its Subcontractors are required to pay the higher of the current applicable prevailing wage rates under federal law, available online at http://www.access.gpo.gov/davisbacon/ca.html.

9.4 Payroll Records. Contractor must comply with the provisions of Labor Code sections 1776 and 1812 and all implementing regulations, which are fully incorporated by this reference, including requirements for electronic submission of payroll records.

(A) ***Contractor and Subcontractor Obligations***. Contractor and each Subcontractor 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 in connection with the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct; and

(2) Contractor or the Subcontractor has complied with the requirements of Labor Code sections 1771, 1811, and 1815 for any Work performed by its employees on the Project.

(B) ***Certified Record.*** A certified copy of an employee's payroll record must be made available for inspection or furnished to the employee or his or her authorized representative on request, to City, to the Division of Labor Standards Enforcement, to the

Division of Apprenticeship Standards of the DIR, and as further required by the Labor Code.

(C) ***Enforcement.*** Upon notice of noncompliance with Labor Code section 1776, Contractor or Subcontractor has ten days in which to comply with requirements of this section. If Contractor or Subcontractor fails to do so within the ten day period, Contractor or Subcontractor will forfeit a penalty of $100.00 per day, or portion a day, for each worker for whom compliance is required, until strict compliance is achieved. Upon request by the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties will be withheld from progress payments then due.

9.5 Labor Compliance. Under Labor Code section 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the DIR.

Article 10 - Safety Provisions

10.1 Safety Precautions and Programs. Contractor and its Subcontractors are fully responsible for safety precautions and programs, and for the safety of persons and property in the performance of the Work. Contractor and its Subcontractors must at all times comply with all applicable safety laws, rules and regulations and seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at the Worksite, materials and equipment stored on or off site, and property at or adjacent to the Worksite.

(A) ***Reporting Requirements.*** Contractor must immediately provide a written report to City of all recordable accidents and injuries occurring at the Worksite. If Contractor is required to file an accident report with a government agency, Contractor will provide a copy of the report to City.

(B) ***Legal Compliance.*** Contractor's safety program must comply with the applicable legal and regulatory requirements. Contractor must provide City with copies of all notices required by law or regulation.

(C) ***Contractor's Obligations.*** Any damage or loss caused by Contractor arising from the Work which is not insured under property insurance must be promptly remedied by Contractor.

(D) ***Remedies.*** If City determines, in its sole discretion, that any part of the Work or Worksite is unsafe, City may, without assuming responsibility for Contractor's safety program, require Contractor or its Subcontractor to cease performance of the Work or to take corrective measures to City's satisfaction. If Contractor fails to promptly take the required corrective measures, City may perform them and deduct the cost from the Contract Price. Contractor agrees it is not entitled to submit a Claim for damages, for an increase in Contract Price, or for a change in Contract Time based on Contractor's compliance with City's request for corrective measures pursuant to this provision.

10.2 Hazardous Materials. Unless otherwise specified in the Contract Documents, this Contract does not include the removal, handling, or disturbance of any asbestos or other Hazardous Materials. If Contractor encounters materials on the Worksite that Contractor reasonably believes to be asbestos or other Hazardous Materials, and the asbestos or other Hazardous Materials have not been rendered harmless, Contractor may continue Work in unaffected areas reasonably believed to be safe, but must immediately cease work on the area affected and report the condition to City. No asbestos, asbestos-containing products or other Hazardous Materials may be used in performance of the Work.

10.3 Material Safety. Contractor is solely responsible for complying with section 5194 of Title 8 of the California Code of Regulations, including by providing information to Contractor's employees about any hazardous chemicals to which they may be exposed in the course of the Work. A hazard communication program and other forms of warning and training about such exposure must be used. Contractor must also maintain Material Safety Data Sheets ("MSDS") at the Worksite, as required by law, for materials or substances used or consumed in the performance of the Work. The MSDS will be accessible and available to Contractor's employees, Subcontractors, and City.

(A) ***Contractor Obligations.*** Contractor is solely responsible for the proper delivery, handling, use, storage, removal, and disposal of all materials brought to the Worksite and/or used in the performance of the Work. Contractor must notify the Engineer if a specified product or material cannot be used safely.

(B) ***Labeling.*** Contractor must ensure proper labeling on any material brought onto the Worksite so that any persons working with or in the vicinity of the material may be informed as to the identity of the material, any potential hazards, and requirements for proper handling, protections, and disposal.

10.4 Hazardous Condition. Contractor is solely responsible for determining whether a hazardous condition exists or is created during the course of the Work, involving a risk of bodily harm to any person or risk of damage to any property. If a hazardous condition exists or is created, Contractor must take all precautions necessary to address the condition and ensure that the Work progresses safely under the circumstances. Such conditions may result from, but are not limited to, use of specified materials or equipment, the Work location, the Worksite condition, the method of construction, or the way any Work must be performed.

Article 11 - Completion and Warranty Provisions

11.1 Final Completion.

(A) ***Final Inspection.*** When the Work required by this Contract is fully performed, Contractor must provide written notification to City requesting final inspection. The Engineer will schedule the date and time for final inspection, which must include Contractor's primary representative for this Project and its superintendent. Based on that inspection, City will prepare a punch list of items that are incomplete, incorrectly installed, or not operating as required by the Contract Documents. The omission of any such item from this punch list will not relieve Contractor from fulfilling all requirements of the Contract Documents.

(B) ***Punch List.*** City will deliver the punch list to Contractor and will specify the time by which all of the punch list items must be completed or corrected. The punch list may include City's estimated cost to complete each punch list item if Contractor fails to do so within the specified time.

(C) ***Requirements for Final Completion.*** Final Completion will be achieved upon completion or correction of all punch list items, as verified by City inspection, and upon satisfaction of all other Contract requirements, including any commissioning required under the Contract Documents and submission of all final submittals, including a warranty bond as required under Section 4.4, instructions and manuals as required under Section 7.10, and as-built drawings as required under Section 7.11, all to City's satisfaction.

(D) ***Acceptance.*** Following Final Completion, the Project will be considered accepted upon City Council action during a public meeting to accept the Project, or if the

Engineer is authorized to accept the Project, the Project will be considered accepted upon the date of the Engineer's issuance of a written notice of acceptance.

(E) ***Final Payment.*** Final Payment and release of retention, less any sums withheld pursuant to the provisions of the Contract Documents, will not be made sooner than 35 days after recordation of the notice of completion. If Contractor fails to complete all of the punch list items within the specified time, City may, acting in its sole discretion, elect to accept the Project, record the notice of completion, and withhold up to 150% of City's estimated cost to complete the remaining items from Final Payment.

11.2 Warranty.

(A) ***General.*** Contractor warrants that all materials and equipment will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. At City's request, Contractor must furnish satisfactory evidence of the quality and type of materials and equipment furnished. Contractor's warranty does not extend to damage caused by normal wear and tear, or improper use or maintenance.

(B) ***Warranty Period.*** Contractor's warranty must guarantee its Work for a period of one year from the date of recordation of the notice of completion (the "Warranty Period"), except when a longer guarantee is provided by a supplier or manufacturer or is required by the Specifications or Special Conditions. Contractor must obtain from its Subcontractors, suppliers and manufacturers any special or extended warranties required by the Contract Documents.

(C) ***Warranty Documents.*** As a condition precedent to acceptance, Contractor must supply City with all warranty and guarantee documents relevant to equipment and materials incorporated into the Work and guaranteed by their suppliers or manufacturers.

(D) ***Subcontractors.*** The warranty obligations in the Contract Documents apply to Work performed by Contractor and its Subcontractors, and Contractor expressly agrees to act as co-guarantor of such Work.

(E) ***Contractor's Obligations.*** Upon written notice from City to Contractor of any defect in the Work discovered during the Warranty Period, Contractor or its responsible Subcontractor must promptly correct the defective Work at its own cost. Contractor's obligation to correct defects discovered during the Warranty Period will continue past the expiration of the Warranty Period as to any defects in Work for which Contractor was notified prior to expiration of the Warranty Period.

(F) ***City's Remedies.*** If Contractor or its responsible Subcontractor fails to correct defective Work within ten days following notice by City, or sooner if required by the circumstances, Contractor expressly agrees that City may correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor must reimburse City for its costs within 30 days following City's submission of a demand(s) for payment pursuant to this provision. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor and its surety are solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein in addition to any and all costs City incurs to correct the defective Work.

(G) ***Emergency Repairs.*** In cases of emergency where any delay in correcting defective Work could cause harm, loss or damage, Contractor expressly agrees that City may immediately correct the defects to conform with the Contract Documents at

Contractor's sole expense. Contractor or its surety must reimburse City for its costs within 30 days following City's submission of a demand(s) for payment pursuant to this provision. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor and its surety are solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein in addition to any and all costs City incurs to immediately correct the defective Work, including any associated overtime charges.

11.3 Use Prior to Final Completion. City reserves the right to occupy or make use of the Project, or any portions of the Project, prior to Final Completion if City has determined that the Project or portion of it is in a condition suitable for the proposed occupation or use, and that it is in its best interest to occupy or make use of the Project, or any portions of it, prior to Final Completion. City will notify Contractor in writing of its intent to occupy or make use of the Project or any portions of the Project, pursuant to this provision.

(A) ***Non-Waiver.*** Occupation or use prior to Final Completion will not operate as acceptance of the Work or any portion of it, nor will it operate as a waiver of any of City's rights or Contractor's duties pursuant to these Contract Documents, and will not affect nor bear on the determination of the time of substantial completion with respect to any statute of repose pertaining to the time for filing an action for construction defect.

(B) ***City's Responsibility.*** City will be responsible for the cost of maintenance and repairs due to normal wear and tear with respect to those portions of the Project that are being occupied or used before Final Completion. The Contract Price or the Contract Time may be adjusted pursuant to the applicable provisions of these Contract Documents if, and only to the extent that, any occupation or use under this Section actually adds to Contractor's cost or time to complete the Work within the Contract Time.

11.4 Substantial Completion. For purposes of determining "substantial completion" with respect to any statute of repose pertaining to the time for filing an action for construction defect, "substantial completion" is deemed to mean the last date that Contractor or any Subcontractor performs Work on the Project prior to recordation of the notice of completion, except for warranty work performed under this Article.

Article 12 - Dispute Resolution

12.1 Claims. This Article applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) ***Definition.*** "Claim" means a separate demand by Contractor, submitted in writing by registered or certified mail with return receipt requested, for change in the Contract Time, including a time extension or relief from liquidated damages, or a change in the Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected or disputed by City, in whole or in part.

(B) ***Limitations.*** A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with Article 5 and Article 6, and subsequently rejected in whole or in part by City.

(C) ***Scope of Article.*** This Article is intended to provide the exclusive procedures for submission and resolution of Claims of any amount, and applies in addition to the

provisions of Public Contract Code Section 9204 and Sections 20104 et seq., which are incorporated by reference herein.

(D) ***No Work Delay.*** Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of the Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to the Claim or other dispute.

12.2 Claims Submission. The following requirements apply to any Claim subject to this Article:

(A) ***Substantiation.*** The Claim must be submitted to City in writing, clearly identified as a "Claim" submitted pursuant to this Article 12, and must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City's written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all labor, materials, taxes, insurance, and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each claimed cost. Any Claim for an extension of time or delay costs must be substantiated with schedule analysis and narrative depicting and explaining claimed time impacts.

(B) ***Claim Format.*** A Claim must be submitted in the following format:

(1) General introduction, specifically identifying the submission as a "Claim" submitted under this Article 12.

(2) Relevant background information, including identification of the specific demand at issue, and the date of City's rejection of that demand.

(3) Detailed explanation of the issue(s) in dispute. For multiple issues, separately number and identify each issue and include the following for each separate issue:

a. The background of the issue, including references to relevant provisions of the Contract Documents;

b. A succinct statement of the matter in dispute, including Contractor's position and the basis for that position;

c. A chronology of relevant events;

d. The identification and attachment of all supporting documents (see subsection (A), above, on Substantiation); and

e. Use of a separate page for each issue.

(4) Summary of issues and damages.

(5) The following certification, executed by Contractor's authorized representative:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim are true and correct. Contractor warrants that this Claim is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay claim not included herein are deemed waived. Contractor understands that submission of a Claim which has no basis in fact or which Contractor knows to be false may violate the False Claims Act (Government Code Section 12650 et seq.)."

(C) ***Submission Deadlines.***

(1) A Claim must be submitted within 15 days following the date that City notified Contractor in writing that a request for a change in the Contract Time or Contract Price, duly submitted in compliance with Article 5 and Article 6, has been rejected in whole or in part.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment, or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 15 days of the effective date of Final Payment, under Section 8.8, above.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. ***Any Claim that is not submitted within the specified deadlines will be deemed waived by Contractor.***

12.3 City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and Contractor or as otherwise allowed under Public Contract Code section 9204. However, if City determines that the Claim is not adequately documented, City may first request in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim. If Contractor fails to submit the additional documentation to City within 15 days of receipt of City's request, the Claim will be deemed waived.

(A) ***Additional Information.*** If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor.

(B) ***Non-Waiver.*** Any failure by City to respond within the times specified above may not be construed as acceptance of the Claim in whole or in part, or as a waiver of any provision of these Contract Documents.

12.4 Meet and Confer. If Contractor disputes City's written response, or City fails to respond within the specified time, within 15 days of receipt of City's response, or within 15 days of City's failure to respond within the applicable 45-day time period under Section 12.3, respectively, Contractor may notify City of the dispute in writing sent by registered or certified mail, return receipt requested, and demand an informal conference to meet and confer for settlement of the issues in dispute. If Contractor fails to dispute City's response in writing within the specified time, Contractor's Claim will be deemed waived.

(A) ***Schedule Meet and Confer.*** Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) ***Location for Meet and Confer.*** The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) ***Written Statement After Meet and Confer.*** Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) ***Submission to Mediation.*** If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the disputed portion(s) will be submitted for mediation, as set forth below.

12.5 Mediation and Government Code Claims.

(A) ***Mediation.*** Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code section 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. The parties will share the costs of mediation equally, except costs incurred by each party for its representation by legal counsel or any other consultants.

(B) ***Government Code Claims***.

(1) Timely presentment of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract.

(2) The time for filing a Government Code Claim will be tolled from the time Contractor submits its written Claim pursuant to Section 12.2, above, until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not fully resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

12.6 Tort Claims. This Article does not apply to tort claims and nothing in this Article is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.

12.7 Arbitration. It is expressly agreed, under California Code of Civil Procedure Section 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.

12.8 Damages. Contractor bears the burden of proving entitlement to and the amount of any claimed damages. Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. Contractor is not entitled to recovery of any alleged home office overhead. The Eichleay Formula or similar formula may not be used for any recovery under the Contract. Contractor is not entitled to special, incidental, or consequential damages, including home office overhead or any form of overhead not directly incurred at the Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract.

12.9 Other Disputes. The procedures in this Article 12 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City. Nothing in this Article is intended to delay suspension or termination under Article 13.

Article 13 - Suspension and Termination

13.1 Suspension for Cause. In addition to all other remedies available to City, if Contractor fails to perform or correct work in accordance with the Contract Documents, City may immediately order the Work, or any portion of it, suspended until the cause for the suspension has been eliminated to City's satisfaction.

(A) ***Failure to Comply.*** Contractor will not be entitled to an increase in Contract Time or Contract Price for a suspension occasioned by Contractor's failure to comply with the Contract Documents.

(B) ***No Duty to Suspend.*** City's right to suspend the Work will not give rise to a duty to suspend the Work, and City's failure to suspend the Work will not constitute a defense to Contractor's failure to comply with the requirements of the Contract Documents.

13.2 Suspension for Convenience. City reserves the right to suspend, delay, or interrupt the performance of the Work in whole or in part, for a period of time determined to be appropriate for City's convenience, and not due to any act or omission by Contractor or its Subcontractors. Upon notice by City pursuant to this provision, Contractor must immediately suspend, delay, or interrupt the Work and secure the Project site as directed by City except for taking measures to protect completed or in progress Work as directed in the suspension notice. The Contract Price and the Contract Time will be equitably adjusted by Change Order to reflect the cost and delay impact occasioned by such suspension for convenience. However, the Contract Time will not be adjusted if the suspension will not delay Final Completion by the Contract Time.

13.3 Termination for Default. Contractor may be deemed in default for a material breach of or inability to perform the Contract, including Contractor's refusal or failure to supply sufficient skilled workers, proper materials, or equipment to perform the Work within the Contract Time; refusal or failure to make prompt payment to its employees, Subcontractors, or suppliers or to correct rejected work; disregard of laws, regulations, ordinances, rules, or orders of any public agency with jurisdiction over the Project; lack of financial capacity to complete the Work within the Contract Time; or responsibility for any other material breach of the Contract requirements.

(A) ***Notice.*** Upon City's determination that Contractor is in default, City may provide Contractor and its surety written notice of default and intent to terminate the Contract.

(B) ***Termination.*** Within seven calendar days after notice of intent to terminate for default has been given, unless the default is cured or arrangements to cure the default have been made and memorialized in writing, to City's satisfaction, City may terminate the Contract by written notice to Contractor with a copy to Contractor's surety.

(C) ***Waiver.*** Time being of the essence in the performance of the Work, if Contractor's surety fails to arrange for completion of the Work in accordance with the Performance Bond, within seven calendar days from the date of the notice of termination, Contractor's surety will be deemed to have waived its right to complete the Work under the Contract, and City may immediately make arrangements for the completion of the Work through use of its own forces, by hiring a replacement contractor, or by any other

means that City determines advisable under the circumstances. Contractor and its surety will be jointly and severally liable for any additional cost incurred by City to complete the Work following termination. In addition, City will have the right to use any materials, supplies, and equipment belonging to Contractor and located at the Worksite for the purposes of completing the remaining Work.

(D) ***Wrongful Termination.*** If a court of competent jurisdiction or an arbitrator later determines that the termination for default was wrongful, the termination will be deemed to be a termination for convenience, and Contractor's damages will be strictly limited to the compensation provided for termination for convenience under Section 13.4, below. Contractor waives any claim for any other damages for wrongful termination including consequential damages, lost opportunity costs or lost profits.

13.4 Termination for Convenience. City reserves the right to terminate all or part of the Contract for convenience upon written notice to Contractor. Upon receipt of such notice, Contractor must: immediately stop the Work, including under any terms or conditions that may be specified in the notice; comply with City's instructions to protect the completed Work and materials; and use its best efforts to minimize further costs. Subject to City's directions in the notice, Contractor must not place further orders or enter into new subcontracts for materials, equipment, services or facilities, except as may be necessary to complete any portion of the Work that is not terminated. Contractor must also promptly cancel, on the most favorable terms possible, all existing subcontracts that relate to performance of the discontinued Work.

(A) ***Compensation to Contractor.*** In the event of City's termination for convenience, Contractor waives any claim for damages, including for loss of anticipated profits from the Project. The following will constitute full and fair compensation to Contractor, and Contractor will not be entitled to any additional claim or compensation:

(1) Completed Work. The value of its Work satisfactorily performed to date, based on Contractor's schedule of values and unpaid costs for items delivered to the Project site that were fabricated for incorporation in the Work;

(2) *Demobilization.* Actual and substantiated demobilization costs; and

(3) *Markup.* Five percent of the total value of the Work performed as of the date of notice of termination or five percent of the value of the Work yet to be completed, whichever is less, which is deemed to cover all overhead and profit to date.

13.5 Effect of Any Contract Termination. Upon any termination pursuant to this Article, City may enter upon and take possession of the Project and the Work. City may also take possession of, for the sole purpose of completing the Work, all of Contractor's tools, equipment and appliances, and all materials on the Work site or stored off the Work site that will be incorporated in the Work. Regardless of any Contract termination, Contractor's obligations for portions of the Work already performed will continue and the provisions of the Contract Documents will remain in effect as to any claim, indemnity obligation, warranties, guarantees, submittals of as-built drawings, instructions, or manuals, or other such rights and obligations arising prior to the termination date.

Article 14 - Miscellaneous Provisions

14.1 Assignment of Unfair Business Practice Claims. Under Public Contract Code section 7103.5, Contractor and its Subcontractors agree to assign to City all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15

U.S.C. section 15) or under the Cartwright Act (Chapter 2 (commencing with section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment will be effective at the time City tenders Final Payment to Contractor, without further acknowledgement by the parties.

14.2 Provisions Deemed Inserted. Every provision of law required to be inserted in the Contract Documents is deemed to be inserted, and the Contract Documents will be construed and enforced as though such provision has been included. If it is discovered that through mistake or otherwise that any required provision was not inserted, or not correctly inserted, the Contract Documents will be deemed amended accordingly.

14.3 Waiver. City's waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents will not be effective unless it is in writing and signed by City. City's waiver of any breach, failure, right, or remedy will not be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor will any waiver constitute a continuing waiver unless specified in writing by City.

14.4 Titles, Headings, and Groupings. The titles and headings used and the groupings of provisions in the Contract Documents are for convenience only and may not be used in the construction or interpretation of the Contract Documents or relied upon for any other purpose.

14.5 Statutory and Regulatory References. With respect to any amendments to any statutes or regulations referenced in these Contract Documents, the reference is deemed to be the version in effect on the date that that bids were due.

END OF GENERAL CONDITIONS

Special Conditions

1. TEMPORARY TREE AND PLANT PROTECTION

1.1 DESCRIPTION

A. The work when under the canopy of existing trees makes the work area a Tree Protection Zone (TPZ). Work within the TPZ will be primarily hand work.
B. This section includes the requirements for the protection of existing trees and shrubs, including entire structure of plant material above and below ground impacted by all demolition and construction work under this contract.
C. Contractor is prohibited from stockpiling any excavation or construction materials within the canopy of trees, on lawn areas or near shrubs.
D. Contractor shall immediately clean and remove any construction residue that falls within the canopy of a tree or near shrubs.
E. Work will include pre-construction meetings on-site with, ongoing consultation by, and periodic tree protection inspections and reports by the Project Arborist.

1.2 REFERENCES

A. Arboriculture – Integrated Management of Landscape Trees, Shrubs & Vines, 4th edition. Harris et al. Prentice Hall. 2004.
B. Guide for Plant Appraisal. 9th Edition. Council of Tree & Landscape Appraisers. International Society of Arboriculture. 2000.
C. Tree Technical Manual. Standards & Specifications. City of Palo Alto. Palo Alto Municipal Code, Chapter 8.10030. Dave Dockter, June 2001 (First edition). Palo Alto Department of Planning & Community Environment. Available online at: http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=6436
D. Pruning Standards:
    1. Best Management Practices, Tree Pruning. 2008. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826-3129. 217-355-9411
    2. ANSI Z133.1 American National Standards for Tree Care Operations. 2006 Edition. Secretariat: National Arborist Association, Inc. American National Standards Institute, 11 West 42nd St., New York, New York, 10036
    3. ANSI A300 Pruning Standards. 2008 Edition. Ibid.
E. Trees & Development. Matheny et al. International Society of Arboriculture. 1998.
F. The Guide for Plant Appraisal, 9th edition. Council of Tree & Landscape Appraisers. International Society of Arboriculture. 2000.

1.3 DEFINITIONS

A. 3 and 5 X DBH: DBH is trunk “diameter at breast height” (4.5 feet above the ground). 3 and 5 times DBH are used to calculate root protection distances for trees in feet from the trunk.
B. Air spade: a commercial grade, hand-held metal probe attached to a large air compressor by a hose. Pressurized air is discharged from the tip of the probe. The air is used to excavate soil away from items such as tree roots, or to dig trenches or remove soil with minimal damage to tree roots (compared to traditional soil removal methods).
C. Arborist Designations:
    1. Arborist: a person who provides advice about urban trees.

2. Board Certified Master Arborist (ISA) must meet higher eligibility requirements than a Certified Arborist, pass a more comprehensive test and has a greater and more specific continuing education requirement.
3. Certified Arborist: is an Arborist certified through the ISA (International Society of Arboriculture) after passing a test demonstrating basic knowledge about urban trees and their management, fulfilling an ongoing continuing education requirement and paying regularly scheduled certification fees.
4. City Arborist is that person designated as such by the City of Cupertino. The City Arborist is responsible for City-owned trees.
5. Project Arborist: A Qualified Arborist who is the appointed consulting arborist for the project and provided and paid for by the Contractor.
6. Qualified Arborist: An ISA Board-Certified Master Arborist and/or or an ASCA RCA that has experience in working as the Project Arborist on construction projects.
7. Registered Consulting Arborist (RCA) is an arborist certified by the ASCA (American Society of Consulting Arborists). This is the highest level of arborist certification and requires a longer period of pre-certification work experience and/or formal education than an ISA Certified or Board-Certified Arborist. RCA's must have a more comprehensive knowledge of arboriculture, and demonstrate a minimum acceptable report writing proficiency.

D. Demo: an abbreviation for Demolition.

E. Designated Tillage Areas: Specifically designated areas within the overall fenced Tree Protection Zone in which general mechanical construction activities may occur, in contrast with the remaining non-tillage areas in which hand-work will be required in order to limit impact on the root zone of the existing trees. The areas outside the driplines of the existing trees are Designated Tillage Areas. Allowable general construction activities in these areas include but not limited to demolition, mechanical grubbing, grading, trenching, equipment cleaning, stockpiling and dumping materials (including soil fill), and equipment operation. Certain limited construction activities, mostly hand-work, including but not limited to soil preparation, paving sub-grade preparation and installation, planting, may occur in areas outside the Designated Tillage Areas with the approval of the City and the Project Arborist.

F. Dripline (tree): the area under the total branch spread of the tree, all around the tree.

G. Existing tree: those trees existing on project property prior to any demolition or construction for a project.

H. Owner: is the City of Cupertino or a designated representative of the City of Cupertino

I. Tree: a woody perennial plant usually having one dominant trunk and a mature height greater than 15 feet. Multiple-trunk trees have more than one trunk.

J. Tree Protection Zone (TPZ) means, unless otherwise specified by the Owner, the area inside the tree protection fencing on a construction project, containing the tree trunk(s) and extending to10 feet beyond the dripline of the tree or as close to this distance as possible, given the nature of the site and proposed improvements. The TPZ should be jointly agreed upon by the general contractor and the Owner and Project Arborist. The TPZ and tree protection fencing are put in place prior to any work on site (including demo) and remain in

effect until the construction project (including landscaping) is fully completed. The TPZ may change during the span of the project (e.g. it may extend outward farther from the trunk if existing improvements are removed during demo) and more open ground space for the tree is created).

K. Tree Service: A company that performs tree pruning and tree removals as their main business. Qualified Tree Service: A tree service with a supervising arborist who has the minimum certification level of ISA (International Society of Arboriculture) Certified Arborist, in a supervisory position on the job site during execution of the tree work. The tree service shall have at least five (5) years' experience and have a State of California Contractor's license for Tree Service (C61-D49) and provide proof of Workman's Compensation and General Liability Insurance. The person(s) performing the tree work must adhere to the most current of the following arboricultural industry tree care standards:
   1. Best Management Practices, Tree Pruning. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826-3129. 217-355-9411
   2. ANSI A300 Pruning Standards. Ibid. (Covers tree care methodology).
   3. ANSI Z133.1 Safety Requirements for Arboricultural Operations. Ibid. (Covers safety).

1.4 JOB CONDITIONS

A. General:
   1. These tree protection specifications apply to any existing tree on site that will not be removed and will be within or near any area where demo or construction will occur. This includes any tree that is not located in an area that is completely fenced off from construction with a perimeter construction fence. If any portion of the canopy of a tree outside the construction zone overhangs a perimeter construction fence, these specifications shall apply to such trees as well.
   2. Trees have value, and a monetary value for individual trees that can be calculated by the project arborist. The contractor may be charged the full value of the tree if a tree that is supposed to be saved is removed due to contractor negligence. Tree damage due to contractor's negligence will be charged at a percentage of the tree damaged, based upon the calculated tree value, up to 100% of that tree's value, as determined by the Owner. The contractor may also be charged for work to repair damage to the tree, including soil compaction remediation.
   3. Unexpected conditions occur and changes are necessary on all construction projects. Such situations may necessitate that changes or modifications be made to these Tree Protection Specifications. Any concerns or conflicts with these Specifications shall be brought to the attention of the Owner immediately so that alternate methods can be agreed upon.
   4. Notify the Owner as soon as there are changes in site or construction management personnel, for example a new site superintendent. The Owner must always be provided with current contact information for the parties who are involved with the project.
   5. New landscaping can severely impact existing trees. Refrain from rototilling within tree driplines. Any planting within this area should be done by hand and not using power equipment such as soil augers. Plants and new irrigation including irrigation trenching are to be kept at least 5 feet away from the trunks of existing trees, depending upon the size and type of tree, and the environmental conditions or as shown on the plans. Farther is better.

6. Underground Utilities: Every attempt should be made to keep new underground utility lines outside tree protection zones and as far away from existing trees as possible. Any utilities found within or passing through tree protection zones at any point in the construction process should be brought to the attention of the Owner. If any utility lines will pass underneath the dripline of the tree, through tree protection zones or within the 5xDBH distance to the trunk, the Project Arborist shall review the utility location and may prescribe any mitigation procedures that will reduce damage to trees and get approval from the Owner. Abandoned pipes and utilities should be cut at existing grade and not pulled out, if their removal would damage tree roots. Trenching radially toward the trunk of the tree, rather than linearly across the trunk and dripline of the tree, will often cause less root damage.
7. Construction Vehicle Access: There shall be a defined route for construction vehicles and large equipment, in order to reduce damage to trees and other vegetation. Clearly show and label the construction vehicle route on the Tree Protection Fencing Plan as well as grading and other applicable construction plans. Preferably there should be one entrance and one exit to the site.
8. Designated Storage & Parking Areas: There must be designated storage and parking areas on site, away from protected trees.
9. The Owner may require the presence of the Project Arborist when work is being completed near driplines or in root areas. Contractor must notify the City at least 4 working days prior to such work so that Arborist can be present.

B. Pre-construction Meeting:
   1. Prior to commencement of work, the Contractor shall arrange a meeting on the site with the City Representative and such others as the City Representative shall direct to review the proposed schedule, the tree and landscape protection, submittals for this Section, and the coordination with work. A copy of these Specifications shall be reviewed at the meeting and is to remain and be accessible at the site at all times.
   2. Adjustments to the type and extent of the protection shall be addressed at the time of the meeting.
   3. Contractor shall coordinate the meeting and inform all parties in writing (5) business days in advance of the scheduled meeting.

C. Environmental Requirements: Perform work only during suitable weather conditions. Do not disc, rototill, or work soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

D. Sequencing and Scheduling: Adjust, relate together, and otherwise coordinate work of this Section with work of Project and all other Sections of Project Specifications.

E. Irrigation: Any trees that will be near work disturbance shall be well hydrated before any demolition or construction work begins. The Project Arborist will determine whether or not irrigation is required at any time before or during the project and will supply directions for irrigation. The frequency and amount of water will depend upon the weather, real or expected root damage to the tree, tree species and condition and the soil moisture status. The Contractor shall irrigate the trees if necessary 2 weeks before any work begins, or as soon as possible prior to the commencement of work, if the soil is not moist to at least 12 inches below the surface. During construction, the Contractor shall be prepared to supply the trees with non-recycled water from a water truck or other suitable water source at least several times per week during the normally dry months, as

well as if there is insufficient rain during the normal wet season. Irrigation directions shall be supplied by the Project Arborist and reviewed by the Owner as necessary to keep the trees properly hydrated.

F. Pruning for site access and construction clearance:
   1. Tree pruning for construction clearance shall be as little as possible, and only what is required to allow site access, demolition and construction. An exception to this would be pruning to mitigate an acute hazardous condition, which should always be done as soon as possible. Aesthetic or other pruning can be done after the project has been completed so do not mix this with site access or construction pruning.
   2. The Contractor shall appoint and utilize a Qualified Tree Service to perform all tree pruning. Contractor will provide qualification to City for acceptance of the Tree Service. Tree work shall be performed according to the most current arboricultural industry standards listed below.
   3. Prior to commencement of any work, the contractor shall submit a Site Access Clearance Pruning Plan for approval and use by the Owner. In order to avoid unnecessary pruning, NO construction clearance pruning will be performed until planned improvements have been properly staked in the field. In the event of pruning required to mitigate an acute hazardous condition, contact the Owner as soon as possible for instructions. The Project Arborist may be required by the Owner to oversee the pruning work.
   4. If urgent pruning is necessary for immediate construction clearance this may be done by the general or demolition contractor if approved by the Project Arborist. In this case a short stub should be left which can be removed by a qualified tree service at a later time. Notify the Owner immediately.

G. Tree Protection Fencing Requirements:
   1. The entire Limit of Work area is a Tree Protection Zone to be fenced and all the trees therein shall be protected by requirements of this Specification Section. Perimeter construction fencing may be used as the overall Tree Protection Fencing. Within the overall Tree Protection Zone, a minimum 6’ diameter area around each tree, or as shown on the drawings, and agreed to by the Project Arborist, is to be protected, and no construction activity may occur in any of these individual protected areas. Parking and other mobilization activities must occur outside of the overall Tree Protection Zone.
   2. Within the overall Tree Protection Zone, certain of the individually protected trees may require more extensive protection as determined by the Project Arborist as conditions warrant. Contractor will be allowed to use Orange safety fence at individual trees as shown on the plans, unless this type of protection is not sufficient to keep the tree safe during construction as determined by the City and Project Arborist. If the City determines that this fencing is not working the Contractor shall be required to install alternate fencing as agreed by the Project Arborist subject to the approval of the City at no extra cost to the City.

H. Fencing Materials and Installation: The fencing shall be as Type 1 Fencing as described below unless otherwise prescribed for certain areas as directed by the Owner. If Type 1 Fencing is not possible on the project or a portion of the project, then this must be brought to the attention of the Owner and alternative fencing agreed to.

1. Type 1 Fencing: Type 1 Fencing: shall be 6-foot high chain-link fencing mounted on 2-inch diameter galvanized posts, driven into the ground to a depth of at least 2 feet and spaced no more than 10 feet apart. An 18 - 24-inch gap shall be left in the fencing for Project Arborist inspection and tree care access. There must be a fence post on either side of this gap.
2. Fencing Placement: Fencing shall be placed 10 feet beyond the dripline of the tree, or as shown on plans. If it is not possible or practical to place the tree protection fencing as directed above given the nature of the site and the proposed work, then the fencing shall be placed as far from the trunk of the tree as possible, while still allowing construction work to progress, in order to protect as much of the ground underneath the canopy of the tree as well as the canopy of the tree itself.
3. The Owner shall meet with the general contractor on the project site prior to both demolition and construction to discuss and agree upon tree protection fencing locations. Tree protection fencing locations shall be spray painted on the ground and any deviations to the Type 1 Tree Protection Fencing must be noted and agreed to by both the Project Arborist and the general contractor and the Owner.
4. The Owner shall inspect the fencing after installation. If the fencing is non-compliant then. No work (including staging of equipment or materials) may begin on site until the Owner has approved the tree protection fencing.
5. The fencing shall not be moved from its Owner approved locations without permission. No work may occur within the fencing without the Owner permission. If contractor or others feel that the fencing must be moved or work must be done inside the fenced area call the Owner to arrange a field meeting. In some cases, this may be taken care of over the phone. Whatever the case, the Owner permission is necessary in order to move or take down the tree protection fencing.
6. Perimeter construction fencing that serves as approved tree protection fencing must have tree protection signs attached to it facing the project site, as described below.

I. Fencing maintenance: Fence posts must be maintained vertical, level and plumb, and shall not be allowed to lean. Fence mesh shall be taught and shall not sag. Do not lean construction equipment, materials, supplies or other items on the tree protection fencing.

J. Tree Protection Fencing Signage: Tree Protection Signs are required to be affixed to all tree protection fencing with four plastic wire ties; one wire tie in each corner of the sign. The City Standard Tree Protection Sign Template shall be used to order and make the Tree Protection Signs. The written portion of the sign shall face the project work area. The sign shall be a minimum 8.5 x 11 inches and be constructed of either aluminum or corrugated plastic. U Signs must be securely affixed to the Tree Protection Fencing with one plastic wire tie in each corner. The top of the sign shall be 6 inches below the top of the fence. The sign must be level and must face the construction work.

K. Duration of Fencing: Tree protection fencing must remain in place until final inspection of the project, including landscaping (unless otherwise authorized by the Owner). A great deal of tree damage can occur during landscaping.

L. Fencing Visibility: Durable neon-colored flagging tape may be woven through the top of the tree protection fencing, or about 12 inches of orange plastic ski fencing can be attached to the top of the metal chain link fencing to increase visibility to vehicle operators.

M. Mulching – Existing Trees to Remain. No supplemental mulching is required for existing trees to remain on this project – however; the existing natural topsoil, surface plant litter and live vegetation must remain in place until landscaping, in order to protect the root system of the trees. No site clearing or grubbing (e.g. scraping of surface of soil to remove vegetation and plant debris) shall occur except in the distinct areas where improvements will be located. Depending upon tree and site conditions, the Project Arborist may call for mulch material (tree trimming chippings from a local tree service) to be delivered to the site and spread around trees as the project progresses

N. Other:
   1. Do not direct vehicle or equipment exhaust toward protection zones.
   2. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.
   3. Restrict vehicular traffic to areas outside the dripline of the tree, even when the entire dripline is not surrounded by tree protection fencing, whenever possible.

1.5 QUALITY ASSURANCE

A. Contractor shall employ the Project Arborist who is a member of the American Society of Consulting Arborists, Inc. (ASCA). The name and qualifications of the Arborist shall be submitted for approval by the City Representative.
   1. Arboricultural work including tree removal, pruning and care for trees to remain shall be performed by personnel familiar with arboricultural work, under the supervision of an experienced professional Arborist and foreman at all times.
      a. Best Management Practices, Tree Pruning. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826-3129. 217-355-9411.
      b. ANSI Z1331 American National Standards for Tree Care Operations. Secretariat: National Arborist Association, Inc. American National Standards Institute, 11 West 42nd St., New York, New York, 10036. (Covers safety)
      c. ANSI A300 Pruning Standards. Ibid. (Covers tree care methodology).

   2. Work in this Section shall be by a firm which has successfully completed landscape work similar in quality and extent to that indicated for this project for a period of not less than five (5) years. Supervisory personnel with experience on projects of similar size and extent shall supervise the work.

1.6 APPROVAL OF TRENCHING AND EXCAVATION

A. The contractor shall obtain written approval from the City Representative and the Project Arborist prior to start of excavation work within the drip line of trees. The Project Arborist shall be retained as needed to provide written direction at the Contractor's expense.

B. The Contractor is prohibited from using equipment for trench and excavation work within the tree drip line.

C. In the event pruning is required for roots greater than 2" in diameter the Contractor shall receive written direction from the City Representative in coordination with Project Arborist prior to continuation of work.

1.7 NON-APPROVED TRENCHING

A. In the event trenching or excavation is performed by the Contractor without the approval or not as shown on the Contract Drawings; the Contractor shall be subject to a fine equal to one half (½) day liquidated damages for every 50-feet.

B. The only exception to paragraph 1.7A above is for trenching to a maximum of 3-feet as measured horizontally without approval at any particular location for the placement of pipe fittings and quick couplers outside the drip line of any tree.

1.8 DAMAGE TO TREES AND PAYMENT FOR DAMAGE

A. Any damage or injury to trees shall be reported within 6-hours to the City Representative.

B. If the Contractor should cause minor damage as defined by nicked tree trunks; limbs and branches or broken branches to trees or shrubs during the course of construction; or scorched leaves from equipment exhaust, the following mitigation, damage control measures and penalties shall apply, to be paid by the Contractor at the beginning of each billing period:
   1. Root injury: Bark or trunk wounding: Current bark tracing and treatment methods shall be performed by a Qualified Tree Service or the Project Arborist within two days.
   2. Scaffold branch or leaf canopy injury: Remove broken or torn branches back to an appropriate branch capable of resuming terminal growth within five days. If leaves are heat scorched from equipment exhaust pipes, consult the Project Arborist within 6 hours.
   3. Fines for damage to trees: $100 per inch of width (e.g. for bark scraping of trunk or branches), as measured by the Project Arborist. Other damage: the full or partial value of the tree (as per Trunk Formula Method, Replacement Cost Method or Cost of Repair Method, as determined by the Owner. For soil compaction (e.g. tree protection fencing was removed and vehicles were parked in the TPZ – the Project Arborist will require water jet irrigation, radial trench mulching, regular mulching and/or other treatments.

C. The Contractor shall replace any trees or shrubs that suffer more serious damage, including damage to roots 2-inches in diameter or larger, during construction at no additional cost to the City. The City Representative shall determine the value of such replacement trees or shrubs. In addition to the Contractor's restoration approved by the City Representative, the Contractor will be assessed damages for the difference in the dollar value of the damaged tree or other plant material, and the dollar value of the replacement.
   1. The dollar value will be determined by the City Representative from the "Guide for Establishing Values of Trees and Other Plants," prepared by the Council of Tree and Landscape Appraisers, current edition. Damages assessed will be deducted from moneys due or that may become due to the Contractor.

D. The Contractor shall in addition be liable for the cost to the City for removing the damaged tree(s). This cost will cover 1.5 times the hourly wage of all person(s) at the site for the required hours to remove the tree(s) and haul offsite as directed by the City Representative.

1.9 MANUAL EXCAVATION

Throughout the TP, as directed by the City Representative, the Contractor shall manually excavate the trench. No machinery shall be used in the areas so designated for manual excavation.

1.10 DAMAGE TO LAWNS, PLANTED AREAS, AND EXISTING IRRIGATION SYSTEMS

A. The Contractor's vehicles and equipment shall not be driven off-road except along designated routes as far away as practical from tree root zones.
B. Vehicles and equipment shall be operated in such a manner as to avoid damage to tree and bush trunks, leaves and branches.

1.11 DG AND OTHER PAVING AND TRENCHING AND INSTALLATION OF UNDERGROUND UTILITIES NEAR TREE ROOTS

A. The Contractor shall not cut any tree roots over 2-inch in diameter unless approved by the Project Arborist. The Contractor shall bend and/or transition underground conduit and piping so that the conduit or piping will thread between tree roots. This 2-inch diameter tree root guideline is dependent of the species of tree or bush. Various trees and bushes have a more fibrous root system, consequently, severing a large number of these roots can be as detrimental to certain species of trees as severing a fewer number of larger tree roots.
B. When possible, trenches shall not be run on the side of the tree exposed to prevailing winds as roots are primarily anchored on the windward side. Trenches shall not be cut across more than on quadrant of the tree root zone.
C. Excavated material (fill and overlay) shall not be deposited under the leaf/needle canopy of established trees. The excavated material shall be placed in piles along one side of a paved surface. In no case shall the Contractor place the excavated material closer than 6-feet from the base of a tree.
D. The Contractor shall be responsible for identifying all underground lighting, electrical control, and irrigation utilities within the project site area. The City will not be providing any field marking service, protecting, and warning the Contractor of the underground facilities. As-built drawings and reference drawings are not available. As part of the contract work, the Contractor shall be required to locate, probe, determine, and flag or mark all underground facilities including, but not limited to, metal and plastic conduits and pipelines, sprinkler heads, quick couplers, valves boxes, controller boxes, pull boxes, prior to excavation.
E. The Contractor shall replace all affected areas with new plantings, decomposed granite paving, or mulch per the drawings within 10 calendar days after beginning excavation. All trenches in pathways and planting areas shall be temporarily covered for immediate use. The Contractor shall not accumulate affected areas for group planting or group paving of trench.
F. The Contractor shall locate quick couplers and lateral lines. The Contractor shall cap tees as shown on the drawings unless located in the field directly under the tree drip line. In these cases, obtain the City Representatives approval for relocating the fitting(s).

1.12 TEMPORARY PROTECTION OF EXISTING TREES AND LANDSCAPE PLANTING

A. Tree Protection fencing for the overall Tree Protection Zone shall be composed of 6' tall chain link fence and posts. Refer to City Standards. Individual trees

within the TPZ may require additional specific protection measures as determined by the Project Arborist in consultation with the Contractor.

B. Temporary materials, new or used, that are adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable Laws and Regulations, and shall be approved by the City Representative.

1.13 EXECUTION

A. Tree Protection Inspections & Documentation: The Project Arborist must supervise any work within the tree protection zone, or when roots or branches of the tree are encountered or are expected to be encountered – whether or not these are within or above the Tree Protection Zone. The Project Arborist will inspect the site for tree protection specification compliance periodically from prior to demolition until immediately after construction is completed. If it is determined that the Project Arborist is required Contractor to give City at least 4 working days' notice to coordinate having Project Arborist scheduled. The resultant Tree Protection Inspection Report will be provided to the Contractor for action. The Tree Protection Inspection Report shall include status of the following:
   1. Inspector name and contact information
   2. Date and time of inspection:
   3. Date of last inspection
   4. Reason for inspection
   5. Weather (approximate temperature, any rainfall, etc.)
   6. Current demolition or construction work on site
   7. Additional demolition or construction work completed since last inspection
   8. Tree protection fencing status (including tree protection signage)
   9. Mulching status (if required)

B. Provide protection for existing landscape planting to remain including, but not limited to, trees, shrubs, and ground cover.

C. Contractor shall provide Temporary Protection suitable for the protection of the landscape planting immediately adjacent to the construction limit of work line, and as directed by the City Representative.

D. The Contractor shall coordinate all other trades and work.

E. All trees within the Limit of Work (LOW) line are within the Tree Protection Zone and are to be enclosed by the overall perimeter fencing at the LOW. Minimum additional protection of 6' diameter around individual trees within the Tree Protection Zone as directed by the Project Arborist is required prior to demolition, grubbing, or grading.

F. Pruning of trees to be retained for clearance requires supervision of the Project Arborist.

G. Temporary Protection shall be kept in place for the duration of the Project, maintained during construction, and temporarily relocated as required by the progress of the construction at no additional cost to the City.

H. Except in the distinct areas where improvements will be located and soil disturbance is necessary for construction, the existing natural topsoil, surface

plant litter and live vegetation must remain in place, in order to protect the root system of the trees. No site clearing or grubbing (e.g. scraping of surface of soil to remove vegetation and plant debris) shall occur except in those areas approved for soil disturbance. Depending upon tree and site conditions, the Project Arborist may call for mulch material to be delivered to the site and spread around trees as the project progresses.

I. Structures, underground features and other improvements to be removed within any tree protection zone shall use the smallest equipment possible, and the equipment shall sit outside the tree protection zone and as far from protected trees as possible. The Project Arborist should be on site to monitor demolition activity. If it is determined that the Project Arborist is required Contractor to give City at least 4 working days' notice to coordinate having Project Arborist scheduled.

J. Unavoidable Vehicle Traffic within Tree Protection Zones: Where vehicles or equipment must travel within tree protection zones, protection of the soil to reduce compaction must be accomplished through one or more of the following, to be approved by the Project Arborist and the Owner:
   1. Apply 6-12 inches of woodchip mulch to the area
   2. Lay 1-inch thick plywood or 4 x 4 inch wood beams over a 4+ inch thick layer of wood chip mulch
   3. Apply 4 to 6 inches of gravel over a taut, staked geotextile fabric
   4. Placing commercial logging or road mats on top of a 4+ inch thick mulch layer
   5. Lay steel plates on top of supportive 4x4" lumber or railroad ties to span over tree root zones.
   6. Note that all stone, and base rock, all geotextile and any mulch exceeding 4 inches in depth will need to be removed after work in the area has been completed.

K. Unavoidable foot traffic or worker access for construction within tree protection zones: The ground surface should be cushioned with one or more of the following, agreed upon by the Project Arborist and the Owner:
   1. Flakes taken from bales of hay and overlain with ¾ or 1" thick sheets of plywood. Use at least 2 layers of flakes (or as many as needed to provide a 4 to 6 inch height. Move this protection as needed, but keep as much of this protection in place as possible.
   2. 6-inches of mulch overlain by ¾-inch thick plywood
   3. 8-12 inches of mulch spread over the ground surface

L. Dealing with Roots that are exposed, must be removed or are damaged: Any soil disturbance within the tree protection zone and/or the tree dripline (whichever is greater) should be done with great care as follows:
   1. If grading (cut or fill) will occur, then hand or air-spade excavate of a root observation and root cutting trench at the edge of soil disturbance near a protected tree(s): this trench must be air spade or hand dug to the depth of the excavation at the edge of the soil disturbance. Roots that must be removed within the soil disturbance area shall be exposed and cut cleanly within this trench. The excavation of this trench must not cause the soil disturbance to come any closer to the tree than is necessary for construction of the improvement. The trench must be at least 12 inches wide. Within the trench, cut exposed roots that need to be removed cleanly with sharp pruning tools as specified. The Project Arborist should be present to inspect the exposed roots after the trench has been dug and also to observe, supervise and assist with the root cutting. If it

is determined that the Project Arborist is required, Contractor is to coordinate scheduling so that City is given at least 4 working days' notice. If the Project Arborist is not present then leave cut root pieces close to the trees from which they were cut, for the arborist to check at a later time.

2. Underground Utility Trench excavations: must be dug by hand, air spade or by mechanically tunneling under roots within the area underneath the dripline of trees or within the fenced-off TPZ for that tree. Trench cuts should be kept moist by spraying with water and covered until backfilled.

3. When mechanical tunneling (boring) is substituted for open trenching, maintain the following depths per trunk DBH. The nearest edge of the excavation for launching and recovery pits should be located at least the 5xDBH distance from the edge of the trunk of the tree. Less root damage will occur if the tunnel is located directly underneath the trunk versus to the side of the trunk.

<9"-9" measured at 6"	2.5' deep
10"-14" measured at 54"	3.0' deep
15"-19" measured at 54"	3.5' deep
>19" measured at 54"	4.0' deep

4. Root cutting tools: The following root uncovering and cutting tools are mandatory:
   - Round-blade shovel
   - Large mattock
   - Tree pruning saws designed for root cutting
   - Pruning loppers with minimum 1-inch diameter cutting capacity

5. The following tools are recommended:
   - Hand mattock
   - Hand trowel shovel
   - Recipro-saw with wood cutting blades (especially pruning blades – have several new blades on hand)
   - Concrete circular saw (rock or root cutting saw, e.g. Stihl TS-400 with a 12-inch blade, preferably carbon or diamond-tipped – start with a new blade and have extra blades on hand).
   - Chain saw (for large roots, e.g. over 4 inches in diameter start with a new chain and have extra chains on hand)

6. Professional root cutting equipment such as a Dosco™ or Vermeer™ root cutting machine may be used for cutting roots over long linear distances, if pre-approved by the Project Arborist.

7. Cutting the roots: Roots that are 2 inches or greater in diameter that must be removed or are damaged must be cleanly cut. Roots smaller than 2 inches in diameter are encouraged to be cut. Roots larger than 4 inches in diameter should not be cut without the Project Arborist's approval. Leave existing roots in place when possible (e.g. routing pipes underneath if this is acceptable). When roots must be cut use appropriate root cutting tools, as specified above. Tools must be sharp and in good condition. Cut roots at a right angle when possible. Cut roots back to branch roots growing in a direction away from the work area when possible. When roots are cut back to a trench wall, cut them

flush with the face of the wall. Do not break, tear or chop rots. Do not use a backhoe or other equipment that rips, tears, or pulls roots. Place all cut roots in a pile near the tree where they were cut so that the Project Arborist can review and document.

8. Covering exposed and/or cut roots and keeping them moist until backfill or other permanent soil covering is in place: Areas of soil disturbance with tree roots (even if roots are not visible) should be sprayed with water on at least a daily basis if necessary in order to keep the exposed soil and roots as moist as possible. On warm days several sprayings may be necessary. This wetting down should continue until permanent covering is placed on the exposed soil surface or trenches are backfilled. Mulch material placed on level areas will keep those areas moister much longer than if the soil is left bare. Trench walls should be sprayed with water and covered with 2 layers of natural (not synthetic) burlap (two or more layers are preferable), discarded carpeting, old sheets or blankets, cardboard sections, organic mulch held in place with plywood or other materials that will perform the same function and are safe for tree roots.

M. Structure demolition: structures should be collapsed inward and/or away from adjacent trees. Demolition equipment must sit outside tree protection zones.

N. Pavement removal: This may be done with a backhoe if done carefully so as not to damage the trunk of the tree, and to disturb the roots of the tree as little as possible. If the backhoe, excavator or heavy equipment bucket or other soil removing device is working within 6 feet of the trunk of the tree, then the trunk must have ¾-inch thick plywood placed in front of it, or the trunk must be wrapped with straw wattle. The backhoe or other equipment must sit on existing pavement or outside the TPZ and work backwards. Alternatively, pavement may be broken into manageable pieces (e.g. by hand with jackhammer) and hand placed onto a loader. Where roots larger than 2 inches in diameter have grown into the existing base course material, use the existing material as the new material and do not remove and replace it. Any roots that are exposed or damaged must be appropriately cut, covered and kept moist as described previously.

1.14 PREPARATION

A. Stake the location of Temporary Protection barriers and fencing as noted above for the approval of the City Representative prior to installation of Temporary Protection fencing. Place location stakes at corners and ends and 30 feet on center maximum.

B. Notify the City Representative at least two weeks in advance of the date for on-site review of the staking.

1.15 INSTALLATION

A. Install Temporary Protection for tree and landscape planting, as specified herein and as approved in the field by the City Representative and the Project Arborist.

B. Fencing to be relocated closer to trees to remain to accommodate the sequence of construction shall be reviewed by the City Representative and the Project Arborist prior to relocation. No removals or construction shall occur without the City Representative's and Project Arborist's approval of the new fence location.

C. Completely remove Temporary Protection, including foundations, associate materials and equipment at the completion of the Project or as directed by the City Representative.

D. Restore and recondition areas of site damaged or disturbed by barrier installation and removal.

E. Dust Control Program. During periods of extended drought, wind or grading, spray wash trunk, limbs and foliage to remove accumulated construction dust. The Project Arborist may request that this be done at their discretion.

1.16 PROHIBITED ACTIVITIES:

A. The following are activities prohibited under existing tree canopies and within protected landscape planting areas:
   1. Excavating or trenching under tree canopies is prohibited and shall be permitted only under the following conditions:
      a. When excavating or trenching within the canopy of trees to remain, the Owner shall be given 48 hours notice. Exercise extreme care during excavation to prevent damage to roots and in a manner that will cause minimum damage to the root system. Such work shall not occur without the Project Arborist to perform compensatory root and branch pruning.
      b. Prune injured roots cleanly. Backfill as soon as possible.
      c. Where tunneling around roots is not practical, roots shall be cut off approximately six inches (6") from construction.
      d. Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or exposed roots shall be packed with wet peat moss or four (4) layers of wet untreated burlap and temporarily supported and protected from damage until permanently covered with backfill.
      e. Thinning shall not remove more than thirty percent (30%) of the existing leaf surface.
      f. Ripping or tearing of roots will not be allowed.

B. Placing backfill under protected trees unless indicated otherwise. Where fill is required for grading, and as indicated on the Drawings, do not fill above existing grade line at trunks. Fill soil must percolate at a rate of 1" per hour minimum.

C. Damage to trunk, canopy, or limbs caused by maneuvering of vehicles or equipment, or stacking of materials and equipment.

D. Driving or parking vehicles; storage of vehicles, equipment, or supplies.

E. Disposing of paint, petroleum products, dirty water, soil sterilants, concrete slurry or other deleterious materials on or around roots or on any landscape areas. Preferably, have a designated washout pit far from landscape areas.

F. Changing site grades which cause drainage to flow into or to collect near protected trees.

G. Using protected trees as support posts, power poles, crane stays, sign posts, or anchorage for ropes, guy wires, power lines, or other similar functions.

H. Damage to root system from flooding, erosion, excessive wetting or drying resulting from dewatering or other operations.

I. Excessive water or heat from equipment, utility line construction, or burning of trash under or near shrubs or trees.

J. No herbicides are allowed to be used underneath pavement or in any other area on site.

K. Any herbicides used on site must be labeled as “safe to use around trees”.

L. Liming of the soil for soil compaction is not allowed near trees: Liming is toxic to plant roots! If there will be any liming on site consult with the Project Arborist long beforehand in order to make sure that the lime is not anywhere near trees or other vegetation that is planned to be saved. A very large lime-free buffer zone (e.g. at least 50 feet) from the dripline of any trees or plants should be maintained between vegetation and liming.

M. Do not use trees as a winch support.

N. Do not hang, tie, attach, lean against or otherwise allow materials, supplies, debris or other things to contact trees.

O. Trees shall not be fertilized before, during or after the construction process unless specifically prescribed by the Project Arborist. Most fertilizer applications to established trees in this area are unnecessary and often cause more harm than good. For example, nitrogen increases plant metabolism and can put additional stress on trees that are already under stress from site (environment) changes and root damage such as commonly occurs during construction projects. Fertilization can also promote unnecessary growth of foliage which removes energy reserves from roots and increases the tree water requirement. Fertilizers are salts that increase the osmotic potential of the soil and can magnify drought stress injury to plants.

1.17 REPLACEMENT OF DAMAGED LANDSCAPE PLANTING

A. Trees and plants destroyed or damaged beyond repair due to Contractor's negligence, failure to provide adequate protection, or failure to perform recommended selective pruning shall be compensated by the Contractor at no additional cost to the City.
   1. Damage beyond repair that requires replacement shall be determined by the City Representative.
   2. Replacement shall include the replacement plant material, transportation, installation, a 30-day maintenance period, and a one year warranty.
   3. Planting location for replacements may be different from the original location and shall be determined by the City Representative.

B. Replace shrubs, ground cover and turf with plants similar in species, size and shape.

C. Replace trees with plants of same species, size and shape.

D. Replacements for trees of 2"-8" caliper shall be replaced with similar sized plants; trees over 8" caliper shall be 60" box size.

E. Since age and size of existing tree may prohibit replacement with same size tree, the difference in caliper between size of damaged tree and replacement of tree shall be compensated by the Contractor.

F. Contractor shall fell trees to be removed so that trees to remain are not injured.

2. Existing Equipment.

2.1 Contractor will carefully remove all existing equipment from the Worksite. If the City specifies or indicates that equipment is to be salvaged and reused or to remain the property of City then the Contractor will reuse or return the equipment to the City. Contractor will store and protect salvaged equipment specified to be reused in the Work. Contractor will deliver to the City in good condition the equipment that is to remain City property but not be reused in the Work.

2.2 If an item specified to be salvaged is damaged during its removal, storage, or handling through carelessness or improper procedures, then Contractor will replace that equipment in kind or with a new item. For those items specified to be salvaged Contractor may choose to instead furnish and install new equipment, in which case the original, removed items will become Contractor's property. Existing materials and equipment removed by Contractor will only be reused in the Work if so specified or indicated by the City.

3. Insurance Requirements. The insurance requirements under Section 4.3 are modified for this Contract, as set forth below. Except as expressly stated below, all other provisions in Section 4.3 are unchanged and remain in full force and effect.

3.1 **Builders Risk Insurance Waived.** The builder's risk insurance policy requirement set forth in subsection 4.3(A)(3) of the General Conditions is hereby waived and does not apply to this Contract.

4. Construction Manager Role and Authority. Gilbane Building Company is the Construction Manager for this Project. The Construction Manager will assist City in the management of the construction of the Project. The Construction Manager may perform services in the areas of supervising and coordination of the work of Contractor and/or other contractors, scheduling the Work, monitoring the progress of the Work, providing City with evaluations and recommendations concerning the quality of the Work, recommending the approval of progress payments to Contractor, or other services for the Project in accordance with the Construction Manager's contract with City.

4.1 **Communications.** Contractor must submit all notices and communications relating to the Work directly to the Construction Manager in writing, as follows:

Gilbane Building Company
1798 Technology Drive, Suite 120
San Jose, CA 95110
(408) 660-4428

With a copy to the Architect:

Bartos Architecture
1730 S. Amphlett Blvd., Suite 225
San Mateo, CA 944020
(650) 340-1221

4.2 **On-Site Management and Communication Procedures.** The Construction Manager will provide and maintain a management team on the Project site to provide contract administration as an agent of City, and will establish and implement coordination and communication procedures among City, the Design Professional, Contractor, and others.

4.3 **Contract Administration Procedures.** The Construction Manager will establish and implement procedures for reviewing and processing requests for clarifications and interpretations of the Contract Documents, Shop Drawings, samples, other submittals, schedule adjustments, Change Order proposals, written proposals for substitutions, payment applications, and maintenance of logs.

4.4 **Pre-Construction Conference.** Contractor will attend the Pre-Construction Conference, during which the Construction Manager will review the Contract administration procedures and Project requirements.

4.5 **Contractor's Construction Schedule.** The Construction Manager will review Contractor's construction schedules and will verify that each schedule is prepared in accordance with the requirements of the Contract Documents.

5. Work Days and Hours. Work hours and noise pose a special concern for projects in residential neighborhoods. The City is very concerned for its residents and will diligently enforce the restrictions below.

5.1 **Work Hours.** 7:00 a.m.-5:00 p.m. local time, weekdays, 9:00 a.m. – 5:00 p.m. on Saturdays, 9:00 – 4:00 p.m. Sundays.

5.2 **Worker Arrival and Parking.** Workers may arrive at the Worksite no earlier than 7:00 a.m. **Violations of these requirements will result in a $3,000 dollar penalty to Bidder/Contractor, per occurrence.**

5.3 **Equipment and Material Delivery and Off-Haul Hours**. No equipment or material may be delivered or off-hauled except between the hours of 7:00 a.m. and 5:00 p.m. No equipment that has a safety back up beeper may be operated before 7:00 a.m. on any day.

5.4 **Work Days Only**. Work will only be performed on Work Days, as defined in the General Conditions, unless Contractor requests otherwise from City in writing at least 2 working days in advance, and City approves the request in its sole discretion. In the case of Work by Contractor after normal working hours,

5.5 **Connections to Existing Facilities**. Unless otherwise specified or indicated, Contractor will make all necessary connections to existing facilities, including structures, drain lines, and utilities such as water, sewer, gas, telephone, and electric. In each case, Contractor will receive permission from City or the owning utility prior to undertaking connections and coordinate as needed to accommodate the facilities operations. Contractor will protect facilities against deleterious substances and damage.

5.6 **Road Shutdown**. Contractor will execute the Work while roads are in operation except for the periods of permitted shutdown. For shutdown periods, Contractor will prepare and submit a detailed plan that includes shutdown schedule, planned sequence of work, milestones and projected times of completions of activities, any anticipated problems, Contractor's supervisory personnel, actions desired of City and staff, and contingency plans. Contractor will allow sufficient time for review and re-submittal of the shutdown plan until acceptable to City. Contractor will employ sufficient labor, superintendence, and equipment on a 24-hour, 7 days a week basis during shutdown and other operational disruptions to complete Work within the specified periods at no additional cost to the City. Once initiated, Work may proceed on extra shift or around-the-clock basis as necessary. When required to minimize treatment process interruptions while complying with specified sequencing constraints, Contractor will provide power, lighting, controls, instrumentation, and safety devices.

5.7 **Noise Limitation**. No non-construction noise will be allowed, this includes amplified music, radio or other noise not due to construction activities.

6. Parking Restrictions. Parking is not permitted on the Project site. Contractor and Subcontractors will direct their respective workers to park at locations to be designated by City, including public parking facilities or public streets adjacent to or near the Project site, in compliance with applicable parking restrictions and requirements, and without blocking driveways and access. Contractor and its Subcontractors will encourage their respective workers to carpool.

7. SUBMITTALS FOR QUALITY ASSURANCE. In the Technical Specifications, the City may specify quality assurance requirements, including qualifications for special skills and experience required of the Contractor. For any specified skill, the Contractor may use a subcontractor that specializes in the work and meets the performance requirements or the Contractor may self-perform the work, subject to demonstrating the necessary skill, experience, and/or certifications to perform the work.

The Contractor will submit verification that the materials and labor skills meet the specified requirements prior to implementing the specific work though the submittal process.

8. Lines and Grades Verification

All Work must be done to the lines, grades, and elevations indicated on the Drawings and Specifications, and in accordance with all applicable codes and laws. Contractor is required to verify forms and other work comply with lines, grades and elevations. Prior to pouring or placing any concrete or asphalt Contractor must have a California licensed land surveyor or civil engineer field verify lines, grades and elevations prior to proceeding with the placement of concrete or asphalt. The land surveyor or civil engineer must have at least five years of relevant experience, and must be acceptable to the City. Contractor must provide City verification of the licensing and experience for each proposed land surveyor or civil engineer. Contractor must provide City with inspection results for form and grade work. Contractor must remedy any non-compliant Work at no additional cost to City.

9. Pre-Construction Conference. City will designate a date and time for a pre-construction conference with Contractor following Contract execution. Project administration procedures and coordination between City and Contractor will be discussed, and Contractor must present City with the following information or documents at the meeting for City's review and acceptance before the Work commences:

9.1 Name, 24-hour contact information, and qualifications of the proposed on-site superintendent;

9.2 List of all key Project personnel and their complete contact information, including email addresses and telephone numbers during regular hours and after hours;

9.3 Staging plans that identify the sequence of the Work, including any phases and alternative sequences or phases, with the goal of minimizing the impacts on residents, businesses and other operations in the Project vicinity;

9.4 If required, traffic control plans associated with the staging plans that are signed and stamped by a licensed traffic engineer;

9.5 Draft baseline schedule for the Work as required under Section 5.2, to be finalized within 10 days after City issues the Notice to Proceed;

9.6 Breakdown of lump sum bid items, to be used for determining the value of Work completed for future progress payments to Contractor;

9.7 Schedule with list of Project submittals that require City review, and list of the proposed material suppliers;

9.8 Plan for coordination with affected utility owner(s) and compliance with any related permit requirements;

9.9 Videotape and photographs recording the conditions throughout the pre-construction Project site, showing the existing improvements and current condition of the curbs, gutters, sidewalks, signs, landscaping, streetlights, structures near the Project such as building faces, canopies, shades and fences, and any other features within the Project area limits;

9.10 If requested by City, Contractor's cash flow projections; and

9.11 Any other documents specified in the Special Conditions or Notice of Award.

10. Close Out Requirements. Contractor's close out requirements include the following, if applicable:

10.1 Contractor must replace in kind, any existing striping within and adjacent to the Project site that is damaged during the Work. Partially damaged striping must be replaced in its entirety.

10.2 Contractor must replace any survey monuments that are damaged or removed during the Work, with a Record of Survey filed by a licensed land surveyor as required by California law.

10.3 Before removing any traffic control or street signs on the Project site, Contractor must take photographs showing their original locations. Upon completion of each phase of construction, Contractor must temporarily reset the signs at those locations. Contractor must then replace the signs permanently upon completion of the Work and the cost of their removal and replacement must be included in the Bid Proposal.

10.4 Contractor must maintain any rural mail boxes on the Project site and relocate them to their permanent locations as soon as possible in the course of the Work, to the satisfaction of the affected property owners and the postal service.

END OF SPECIAL CONDITIONS

Project Forms

Contractor must use the Project forms provided with these Contract Documents, as specified in the Contract Documents, in addition to any City-required forms provided at the pre-construction conference. The following forms are included in the Project manual:

Substitution Request Form

Indemnity Agreement (Site Investigation)

Release of Claims Form

Insurance Forms:

- *Insurance Forms Instructions*
- *Certificate of Insurance to the City of Cupertino*
- *Additional Insured Endorsement/Endorsement of Primary Insurance/Notice of Policy Cancellation Endorsement*
- *Comprehensive General Liability Commercial General Liability Endorsement of Aggregate Limits of Insurance Per Project*
- *Waiver of Subrogation Endorsement Workers' Compensation Insurance*

Substitution Request Form

This Substitution Request Form must be used for each requested substitution, including pre-bid and post-award requests. Reference Section 12 of Instructions to Bidders and/or Section 7.7 of the General Conditions for applicable substitution request requirements. The form must be completed fully and legibly as directed using additional pages if needed, dated, signed and submitted with all attachments via _____<email/mail/other> to _____<name and title> at _____<email/address>.

1. Bidder/Contractor Name:_____

2. Subcontractor/supplier Name (if applicable):_____

3. Precisely identify by Specification, Drawing and/or detail number(s) the specified item that is the subject of this request (the "Specified Item"):_____

4. Identify and describe the proposed substitution ("Proposed Substitution"):_____

5. Explain the reason for requesting substitution of the Specified Item:_____

6. Explain why the Proposed Substitution is equal or superior to the Specified Item. Attach manufacturer's literature, including complete technical data and laboratory test results, if applicable. _____

7. Describe the differences between the Proposed Substitution and the Specified Item:
_____

8. Provide complete and specific information on changes to Drawings and Specifications that will be required for the Proposed Substitution, attaching separate sheets, including drawings, as needed:
_____
_____

9. Explain how the Proposed Substitution will affect dimensions shown on the Drawings:

_____

10. Are the manufacturer's guarantees and warranties on the Proposed Substitution equal or superior to those on the specified items? ___Yes / ___No

If yes, describe each difference in detail:

_____

11. If approved, what effect will the substitution have on other contractors, trades, or suppliers?

_____

12. Will granting the requested substitution cause any schedule delay? ___Yes / ___No

If yes, explain:
_____

13. What is the estimated increase or decrease in the Contract Price if the Proposed Substitution is approved?

Increase cost by $_____ or Decrease cost by $_____ or No change_____

14. If the Proposed Substitution has a color or pattern, provide a color board showing Proposed Substitution in relation to the other adjacent colors and patterns.

15. List each document attached to this Substitution Request Form:

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

By signing below, the Bidder or Contractor submitting this request for substitution certifies that the function, appearance, and quality of the Proposed Substitution is equivalent or superior to those of the Specified Item.

Submittal Date: _____

Submitted by:

_____
Bidder/Contractor Name

_____
Signature

_____
Name / Title

_____
Address

_____
City/State/Zip

Telephone: _____

Date: _____

Email: _____

For Use by City:

_____ Accepted _____Accepted as Noted

_____ Not Accepted _____Received Too Late

By: _____
City's Representative

Date: _____

Remarks: _____

_____

_____

_____

_____

END OF DOCUMENT

Indemnity Agreement
(Site Investigation)

This Indemnity Agreement for site investigation ("Agreement") is entered into by and between the City of Cupertino ("City") and _____, a licensed contractor and potential bidder ("Bidder") for the City's _____ Project ("Project"), and is effective upon approval and execution by City, below. In consideration of City's permitting Bidder to have access to, and to conduct investigations, tests and/or inspections on, the Project Site ("Site"), Bidder hereby agrees as follows:

1. To the fullest extent permitted by law, Bidder will indemnify, defend, and hold harmless City, its Council, officers, officials, employees, agents, volunteers and consultants (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability, loss, damage, claims, causes of action, demands, charges, costs and expenses (including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of or in connection with investigation of the Site, including, but not limited to, testing, inspections, ingress or egress (collectively, "Site Investigation"), by Bidder, its employees, prospective or current subcontractors, representatives, or agents regardless of any contributory negligence by any Indemnitee.

2. Bidder assumes all risk for any injury or damages arising from Bidder's entry onto or activities at the Site, and fully waives and releases the City from any liability for any injury or damages arising from or pertaining to existing conditions at the Site. Bidder waives the provisions of California Civil Code Section 1542 which provides as follows:

> A general release does not extend to claims that 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.

3. Bidder will promptly repair any damage to the Site or adjacent property resulting from the Site Investigation, and comply with and be subject to all other requirements set forth in section 8.4, of the Instructions to Bidders (Pre-Bid Investigation).

4. Bidder has attached a certificate(s) of insurance evidencing insurance coverage that meets or exceeds the insurance requirements included in the Project General Conditions, using a form or forms acceptable to the City.

5. This Agreement is fully effective and binding on Bidder regardless of whether Bidder submits a bid for the Project, and regardless of whether Bidder is awarded a contract for the Project.

_____ Bidder Business Name	_____ Date
_____ Signature	_____ Signature
_____ Name/Title (If Corporation: Chairman, President or Vice President)	_____ Name/Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)

Agreed and Approved by the City of Cupertino:

_____ _____

Signature Date

_____

Name/Title

Release of Claims

If required by the City of Cupertino for the above-referenced project ("Project"), this Release of Claims form must be completed as indicated, signed and submitted with Contractor's payment application pursuant to Section 8.9 of the Contract General Conditions. Unless otherwise specified, all defined terms in this Release of Claims form have the same meaning as stated in Article 1 of the Contract General Conditions.

Contractor Name: _____
Payment Application Number: _____
Amount Requested: $_____

1. Undisputed Amounts. Upon receipt of all undisputed amounts ("Undisputed Amounts") from the City of Cupertino ("City") for Work included in the above-referenced payment application, Contractor releases all claims against the City that relate to the Undisputed Amounts. Contractor's release is a full, final, and general release of all claims, demands, actions, causes of action, obligations, costs, additional compensation, extension of the Contract Time, expenses, damages, losses and liability against the City, its City Council, collectively and individually, and all of City's officers, officials, employees, consultants, inspectors, agents, representatives, assignees or transferees with respect to the Undisputed Amounts.

2. Civil Code Waiver. With respect to the above release for the Undisputed Amounts, Contractor waives the provisions of Civil Code section 1542, which states:

> "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."

3. Disputed Claims. Pursuant to Public Contract Code section 7100, Contractor's release and waiver of the claims related to the Undisputed Amounts does not extend to disputed contract claims in stated amount excluded by Contractor, as follows:

Claim No.	Date	Amount Claimed	Description

[Information may be attached on a separate page]

4. Legal Effect. By signing below, Contractor agrees that this Release of Claims will operate as a complete defense for City against any later attempts to seek recovery or damages of any kind against City that relate to the Undisputed Amounts.

5. Authorization and Execution. This Release of Claims must be signed by Contractor's authorized representative. If Contractor is a partnership this Release of Claims must be signed in the partnership name by a general partner with authority to bind the partnership. If Contractor is a corporation this Release of Claims must be signed with the legal name of the corporation,

followed by the signature and title of two officers of the corporation with full authority to bind the corporation to the terms of the Release of Claims, under California Corporation Code section 313. Each individual signing below warrants that he or she is fully authorized to execute this Release of Claims on behalf of Contractor and that it will be binding against Contractor.

Contractor hereby agrees to all terms and conditions of this Release of Claims:

_____ Contractor Business Name	_____ Date
_____ Signature	_____ Signature
_____ Name/Title (If Corporation: Chairman, President or Vice President)	_____ Name/Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)

Agreed and Approved by the City of Cupertino:

_____ Signature	_____ Date
_____ Name/Title	

Insurance Forms

Insurance Forms Instructions

For Items 2, 3 and 4, the forms provided by the City of Cupertino must be used. Forms other than these will not be accepted.

All documents must be originals - submit in triplicate.

1. *Certificate of Insurance to the City of Cupertino* - **must** be completed by the insurance agent **or must** provide a certificate on the company's form. They **must** contain the same information.

2. *Endorsement of Additional Insured and Primary Insurance and Notice of Cancellation* - **must** be signed by the insurance agent for general liability and automobile liability only.

3. *Comprehensive General Liability/Commercial General Liability Endorsement of Aggregate Limits of Insurance Per Project* - **must** be signed by the insurance agent for general liability only.

4. *Waiver of Subrogation Endorsement Worker's Compensation Insurance* - **must** be signed by the insurance agent for worker's compensation only.

CERTIFICATE OF INSURANCE TO THE CITY OF CUPERTINO

This certifies to the City of Cupertino that the following described policies have been issued to the insured named below and are in force at this time.

Insured: _____

Address: _____

_____

Description of operations/locations/products insured (show contract name and/or number, if any):

_____

_____

==========

WORKER'S COMPENSATION * Statutory Min.
* Employer's Liability

_____
(name of insurer)

$ _____ $ _____ $ _____

Insurance Company's State License No. _____

==========

Check Policy Type: Each Occurrence
$_____

COMPREHENSIVE GENERAL LIABILITY

[ ] Premises/Operations General Aggregate
$_____
(if applicable)

[ ] Owners & Contractors Protective Aggregate
$_____

[ ] Contractual for Specific Contract Personal Injury
$_____

[ ] Products Liability

[ ] XCU Hazards

[ ] Broad Form P.D. Fire Damage (any one fire)
$_____

[ ] Severability of Interest Clause

[ ] Personal Injury with Medical Expense
$_____

Employee Exclusion Removed (any one person)
or Self-Insured
COMMERCIAL GENERAL LIABILITY Retention
$_____

_____
(name of insurer)

Policy No. _____ Expiration Date_____

==========

AUTOMOTIVE/VEHICLE LIABILITY	BODILY INJURY	PROPERTY DAMAGE
Commercial Form	Each Person	Each Accident
Liability Coverage	$_____	
$_____	Each Accident	
_____ (name of insurer)	$_____ or	
	Combined Single Limit	
$_____		

Policy No. _____ Expiration Date _____

==========

BUILDER'S RISK "ALL RISK"

This is to certify that the following policy has been issued by the below-stated company in conformance with the requirements of the project documents and is in force at this time.

_____
(Name of insurer)

Policy No. _____ Expiration Date_____

Limits of Liability: _____ Deductible: _____

==========

_____ A copy of all Endorsements to the policy(ies) which in any way limit the above-listed types of coverage are attached to this Certificate of Insurance.
(agent's initial)

This Certificate of Insurance is not an insurance policy and does not amend, extend or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term, or condition of any contract or any other document with respect to which this Certificate of Insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

IT IS HEREBY CERTIFIED that the above policy(ies) provide liability insurance as required by the Agreement between the City and the insured.

By:_____

Dated:_____20____

Attach Certificate of Insurance and Additional Insured Endorsement on company forms.

ADDITIONAL INSURED ENDORSEMENT
and
ENDORSEMENT OF PRIMARY INSURANCE
and
NOTICE OF POLICY
CANCELLATION ENDORSEMENT

Project Title and Number:_____

In consideration of the policy premium and notwithstanding any inconsistent statement in the policy to which this Endorsement is attached or any other Endorsement attached thereto, it is agreed as follows:

The City of Cupertino ("City") and its directors, officers, engineers, agents and employees, and all public agencies from whom permits will be obtained and their directors, officers, engineers, agents and employees, and the State of California, and its officers, agents and employees, are hereby declared to be additional insureds under the terms of this policy, but only with respect to the operations of the Contractor at or upon any of the premises of the City in connection with the Contract with the City, or acts or omissions of the additional insureds in connection with, but limited to its general supervision or inspection of said operations.

The insurance afforded by this policy is primary insurance, and no additional insurance held or owned by the designated additional insured(s) shall be called upon to cover a loss under said additional policy.

Cancellation Notice. The insurance afforded by this policy shall not be suspended, voided, canceled, reduced in coverage or in limits, or materially altered, except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the City of Cupertino ("City"). Such notice shall be addressed to the City as indicated below.

POLICY INFORMATION

1. Insurance Company:_____

2. Insurance Policy Number:_____

3. Effective Date of this Endorsement:_____20____

4. Insured:_____

All notices herein provided to be given by the Insurance Company to the City in connection with this policy and these Endorsements, shall be mailed to or delivered to the City at 10300 Torre Avenue; Cupertino, California 95014.

[Signature on following page.]

I, _____(print/type name) warrant that I have authority to bind the below listed Insurance Company and by my signature hereon do so bind this Company.

Signature of Authorized Representative:_____
(Original signature required on all Endorsements furnished to the City)

Names of
Agent/Agency:_____ Title:_____

Address:_____Telephone: _____ _____ _____

_____ Facsimile: _____ _____ _____

COMPREHENSIVE GENERAL LIABILITY
COMMERCIAL GENERAL LIABILITY
ENDORSEMENT OF AGGREGATE LIMITS OF INSURANCE PER PROJECT

Project Title and Number:_____

In consideration of the policy premium and notwithstanding any inconsistent statement in the policy to which this Endorsement is attached or any other Endorsement attached thereto, it is as follows:

This Endorsement modifies the insurance provided under the General Liability Coverage part of the below-referenced policy of insurance.

The general aggregate limit under LIMITS OF INSURANCE applies separately to the project described as

_____

POLICY INFORMATION

1. Insurance Company:_____

2. Insurance Policy Number:_____

3. Effective Date of this Endorsement:_____20____

4. Insured:_____

5. Additional Insured: City of Cupertino, its directors, officers, agents and employees.

All notices herein provided to be given by the Insurance Company to the City in connection with this policy and this Endorsement, shall be mailed to or delivered to the City at 10300 Torre Avenue; Cupertino, California 95014.

I, _____(print/type name) warrant that I have authority to bind the below listed Insurance Company and by my signature hereon do so bind this Company.

Signature of Authorized Representative:_____
(Original signature required on all Endorsements furnished to the City)

Names of
Agent/Agency:_____
Title:_____
Address:_____ Telephone: _____ _____ _____
_____ Facsimile: _____ _____ _____

WAIVER OF SUBROGATION ENDORSEMENT
WORKER'S COMPENSATION INSURANCE

Project Title and Number:_____

In consideration of the policy premium and notwithstanding any inconsistent statement in the policy to which this Endorsement is attached or any other Endorsement attached thereto, it is agreed as follows:

It is agreed that with respect to such insurance as is afforded by the policy, the Insurance Company waives any right of subrogation against the City of Cupertino, and each of its directors, officers, agents, consultants and employees by reason of any payment made on account of injury, including death resulting therefrom, sustained by any employee of the insured, arising out of the performance of the above-referenced Contract.

POLICY INFORMATION

1. Insurance Company:_____

2. Insurance Policy Number:_____

3. Effective Date of this Endorsement:_____20____

4. Insured:_____

All notices herein provided to be given by the Insurance Company to the City in connection with this policy and this Endorsement, shall be mailed to or delivered to the City at 10300 Torre Avenue; Cupertino, California 95014.

I, _____(print/type name) warrant that I have authority to bind the below listed Insurance Company and by my signature hereon do so bind this Company.

Signature of Authorized Representative:_____
(Original signature required on all Endorsements furnished to the City)

Names of
Agent/Agency:_____ Title:_____

Address:_____Telephone: _____ _____ _____

_____Facsimile: _____ _____ _____

END OF DOCUMENT

Contents

Division 31 00 00 Earthwork

Division 32 00 00 Exterior Improvements

Division 33 00 00 Exterior Improvements

Drawing Index

Architectural

Structural

Electrical

Civil

This page intentionally left blank

Section 02 41 00

General Demolition

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

Item	Description
General	• General Demolition Requirements
Special Coordination	• Refer to Related Sections for specific project requirements not included herein.

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

1.03 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

Item	Description
Catalog Cuts	• n/a
Product Data	• n/a
Samples	• n/a
Shop Drawings	• n/a
Schedule	• Include Schedule entry on Gantt Chart for General Demolition

1.04 References/Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

References	• n/a
Standard	• n/a

1.05 Quality Assurance

A. Provide the following per the General Conditions

Item	Description
Supervision	• Full time supervision and observation by the Contractor of all on-site Construction Activities. • Ensure that all items to be retained in good condition and turned over to owner are properly protected.
Qualifications of Workers	• General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.
Product Acceptance	• n/a
Substrate Acceptance	• General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.

1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Item	Description
Supervision	• Per the General Conditions
Testing	• n/a
Special Inspections	• n/a
Mock Ups	• n/a

1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

Item	Description
Observation	• • Per the General Conditions
Inspection	• n/a
Testing	• n/a
Special Inspections	• n/a

1.08 Closeout

A. Provide the following Close Out materials in accordance with the General Conditions.

Item	Description
Product Manuals	• n/a
System Manuals	• n/a
Maint. Tools/Materials	• n/a
Surplus Materials	• n/a
Training	• n/a

1.09 Warranty

A. Provide written warranty in accordance with the General Conditions.

Item	Description
Warranty Form	• Per the General Conditions
Warranty Period	• 1 year
Warranty Start	• Date of Substantial Completion

Part 2. Products

2.01 Not Used

Part 3. Execution

3.01 Demolition Section of Other Disciplines

A. This section shall apply to all demolition work defined under any other section of this Specification. Conflicts between this section and other sections shall be resolved by the Architect with favor to the most restrictive stipulation.

B. All trades shall review all documents to determine the extent to which their demolition work may require support work from other trades.

C. The Contractor shall be responsible to ensure that all trade work required for demolition tasks is provided regardless of the inclusion of that trade in any Plans or Demolition Sections.

1. Contractor shall provide complete service including specified demolition work as well as collateral requirements for repair, closure, termination or re-routing. No claims shall be made for incidental or peripheral demolition work associated with any specified work.

3.02 Transfer of Responsibility and Disposition of Materials

A. Contractor shall consult with Owner prior to commencing any demolition and determine which existing items and equipment are of value to the Owner. These items shall be carefully removed to avoid damage and shall be delivered to the Owner as directed.

B. Title to all remaining items, equipment and fixtures required to be removed, shall be vested in the Contractor whereupon the Owner will not be responsible for the condition, loss or damage to said property. All such items shall be removed from the Owner's property.

3.03 Supervision Requirements

A. Provide continuous supervision of all demolition activities. All demolition work shall be done in conjunction with the Contract Documents and shall accommodate provisions of all aspects of the Documents.

B. Conduct demolition to minimize interference with adjacent structures.

C. Conduct operations with minimum interference to public or private accesses.

D. Maintain egress and access at all times. Do not close or obstruct roadways without permits.

E. Cease operations immediately if adjacent structures appear to be in danger. Notify Architect.

3.04 Site Safety During Demolition Operations

A. Contractor shall provide fire watch for the site or facility during temporary shutdown of fire alarm or fire suppression systems.

B. Contractor shall provide security services for the site or facility during temporary shutdown of the security systems.

C. Contractor shall provide traffic control during disruption of normal traffic flow on site due to temporary alterations in site circulation system.

D. Contractor shall provide pedestrian control during demolition operations to ensure pedestrians are protected from equipment and materials.

E. Contractor shall provide vision shielding to prevent observation by the public of cutting and welding torches or any other source of bright light that may damage vision.

F. Refer to Site Safety Section of this specification.

3.05 Demolition Scheduling

A. Contractor acknowledges that Demolition Scheduling shall be coordinated with the Architect for the beneficial operation of the City of Cupertino's Site. Contractor shall place no limitation on the extent of coordination of Demolition activities for this purpose.

B. Contractor acknowledges that Demolition work may occur in multiple and repetitive tasks and may occur at different locations at different times, dependent on the needs of the Site to maintain access, operation, utilities, systems and safety.

1. Demolition tasks may be restricted to certain work times based on any one of the following:

   (a) Occupancy of adjacent areas by the City and the need to minimize disruption at particular times.
   (b) Need to maintain operation of critical systems and utilities at particular times

2. Demolition tasks may be restricted to certain work areas based on the nature and scope of the task and its potential affect on the users of adjacent occupied spaces.

C. All Demolition Scheduling shall be reviewed with the Architect prior to commencing operations.

1. Demolition of any items that could affect daily operations of the site shall be scheduled with the City of Cupertino to occur and be replaced with new construction during non-business hours.
2. Demolition Operations may be limited to weekends and holidays.

D. Contractor shall provide allowance for multiple demolition exercises as may be required to facilitate the City of Cupertino's schedule. Coordination of demolition scheduling with City of Cupertino operational needs shall not be allowed as the basis of delay claims.

3.06 Notification of Demolition

A. Provide notification of the commencement of any demolition task or phase 48 hours in advance.

B. Do not commence demolition until the Architect has approved the task or phase and coordinated the schedule with the City of Cupertino.

3.07 Demolition Equipment

A. Contractor shall provide all equipment and materials as may be necessary to perform the demolition work within the limitations of this section. No claims shall be made for special equipment or processes based on limitations of this section.

B. Contractor shall provide equipment and tools of appropriate size, operation and function to accomplish demolition tasks within the restrictions described herein.

1. Provide equipment of appropriate size to ensure the protection of existing facilities, materials and systems.

3.08 Preparation

A. Provide, erect, and maintain temporary barriers and security devices. Include chain link fence around each phase of construction

1. Include protection of all existing trees.

B. Mark all items to be removed.

C. Provide layout as required to direct slab and wall removal. Identify slab and walls requiring precise cutting and demolition for future fitting of new construction.

3.09 Dust Control

A. All demolition activities shall include adequate measures for dust control. Contractor shall provide any and all means necessary to prevent the circulation of dust into adjacent buildings and site areas.

B. Contractor shall provide the following as needed or at the request of the Architect:

1. Watering shall occur over transit areas including equipment routes, equipment loads and parking areas.
2. Opening protection at all areas that may include plastic barriers, fans and other means to prevent dust from spreading throughout building.
3. Dust removal: Sweep or wash down of adjacent site and building areas that will be used by the public.

C. Use all means necessary to prevent the spread of dust during performance of the work of this Section; provide dust curtains of fireproof polyethylene where indicated and where applicable, moisten surfaces as required.

D. Provide sealed membranes with zipper operated doors over corridors and passage ways separating the work zone from occupied spaces. Provide sealed membranes over windows and ventilation openings.

1. Membranes shall not limit operability of windows and ventilation systems in areas occupied by the public.
2. In no case shall barriers obstruct required exit routes.

3.10 Demolition

A. Demolish and remove components in an orderly and careful manner, in sequence as indicated on Drawings or as determined by consultation with Architect.

B. Coordinate all structural shoring and demolition to insure that no settling, deflection or other failure occurs as a result of removal or modification of existing elements.

C. Protect existing supporting structural members.

D. Clearly direct demolition work so that items to remain are protected.

E. Disconnect, cap and identify designated utilities.

1. Cap utilities at appropriate locations for future service, reconnection.
2. Architect may require removal of piping and raceway beyond specific work areas in order to achieve appropriate location for utility termination.

F. Execute demolition work to ensure safety of persons and adjacent property against damage by falling debris or other causes in connection of this work.

3.11 Termination of Utilities

A. All demolition of utility piping, wring or ductwork shall include functional termination of piping, wiring and ductwork to remain such that:

1. Operation of remaining systems is not affected or disrupted.
2. Terminations can be accessed for reconnection or re-routing either as part of this work or as specified in other projects.

B. Demolition of site and building utilities shall provide for termination and investigation regarding the operation of remaining components in adjacent buildings. Contractor shall explicitly ensure that removal of any component specified herein does not prevent remaining components from operating in occupied spaces.

3.12 Re-Installation / Reconstruction

A. Demolition work may require the temporary removal of material, assemblies and equipment that is intended to remain. Demolition work shall require the re-installation of such items to their original condition

1. Reinstallation may affect utility systems and components, electrical systems , communications and data systems and alarm systems.
2. All critical systems shall be maintained in working order for the remainder of the site. No demolition work shall be allowed that will disable and system beyond the extent of a temporary shutdown.
3. Contractor is responsible for returning any system to operation for adjacent areas where work of this contract has interrupted that operation.

3.13 Repair and Replacement of Damaged Assemblies, Utilities Systems

A. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to the City of Cupertino.

B. Contractor is responsible for repair, replacement of any system or component damaged by demolition work.

3.14 Surface Restoration of Materials to Remain

A. Where surfaces are to remain unfinished, as indicated on the drawings, Contractor shall restore such surfaces to be free of paint, plaster, fasteners, and holes.

1. Contractor shall power-wash and/or sand/bead-blast all masonry and concrete surfaces indicated as to remain unfinished.
2. Contractor shall extract all fasteners, including powder-driven fasteners, expansion anchors, and lead anchors, and patch resulting holes to match adjacent surface. Alternatively, fasteners may be cut off at least 1/2” below surface of remaining material, and patched to match adjacent surface.

B. Unfinished surfaces which are to remain visible when construction is complete shall be restored uniformly, regardless of whether the damage or marks were pre-existing or caused by demolition work.

C. Surfaces receiving new finishes shall be prepared per Specifications and manufacturer’s instructions for the specified finishes.

3.15 Disposal of Debris

A. Remove from the site and legally dispose of all debris resulting from demolition operations.

B. Provide certification that all materials have been disposed of at appropriate facilities via appropriate methods.

1. Provide dump receipts describing yardage and material content.

2. Provide certification for all hazardous materials.

3.16 Recycling

A. Prepare a recycling plan describing the types and estimated quantities of materials to be removed that can be recycled.

B. Dispose of all recyclable materials at appropriate disposal facilities as required by local regulatory agencies.

C. Provide receipts from all facilities at which material was deposited for recycling purposes.

3.17 Cleaning

A. Remove demolished materials from site as work progresses.

1. Provide debris box or trucking as appropriate to task.
2. Remove debris boxes upon filling to capacity.
3. Remove partially filled boxes within one week of delivery.
4. Prevent access to debris boxes by the public.

B. Leave areas of work in clean condition.

1. Provide sweeping, vacuuming, mopping and other janitorial services as required.

End of Section

This page intentionally left blank

Section 03 10 00

Formwork

Part 1. General

1.1 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to work of this Section as fully as if repeated here.

1.2 DESCRIPTION:

A. Furnish and install all cast in place concrete formwork as shown and specified, including the following:

1. Design of the formwork, shoring and falsework.

2. Placement of all cast-in anchors, inserts, bolts, sleeves and similar items, including those furnished under other Sections.

B. Related work described elsewhere:

1. See other sections of Division 3.

1.3 QUALITY ASSURANCE:

A. Comply with the following codes and standards by the California Building Standards Commission and American Concrete Institute (ACI):

1. 2016 California Building Code (CBC).

2. ACI 347, “Recommended Practice for Concrete Formwork”.

3. Applicable jurisdictional agency.

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Design and provide engineering services as required, for all formwork and related items such as bracing and blocking, required for the concrete work to be placed on the Project. Design shall be in accordance with the requirements of ACI 347, the requirements of these Contract Documents, and the applicable Building jurisdiction agency.

1.4 SEQUENCING/SCHEDULING:

A. Coordinate installation of forms with other Sections, including but not limited to, Mechanical (Division 15), and Electrical (Division 16), to provide all required sleeves, blockouts, openings, reglets, chases, etc., required.

Part 2. Products

1.5 MATERIALS:

A. Forms: ACI 347, Table 4.1.

B. Miscellaneous Materials:

1. Ties and spreaders: Factory fabricated, adjustable length, removable or snap-off metal ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal of forms. MeadowBurke, of a type which does not leave an open hole through the concrete and which permits neat, solid patching at every hole. Any metal shall be a minimum of 1-1/2 inches from the outer concrete surface. Site fabricated ties, wire ties, or wood spreaders are not permitted.

2. Corner forms, recess and chamfer strips: Extruded polyvinyl chloride specially produced for concrete formwork; MeadowBurke, Dayton Superior or approved equal.

3. Form coating and/or form release: VOC compliant, of a type which will not harmfully affect the appearance and/or utility of the concrete surface or the application of sealers, paint, vinyl fabric, or any other finishes; BASF MBT Rheofinish 211, Conspec By Dayton Superior, or approved equal.

PART 3 Execution

3.1 DESIGN & GENERAL CONSTRUCTION:

A. Design and construct all forms, falsework, supports, etc. to be adequate in size and strength for safety, and to resist all loads imposed upon them without deformation, deflection, or settlement.

B. Design and place shoring so the load from successive parts of the structure will be transmitted directly through the falsework to adequate support, without creating bending or shearing stresses in the concrete. Do not remove shores until supported members have attained sufficient strength to carry the imposed loads. Construct forms to permit their removal without disturbing the original shoring. Re-shoring will not be permitted.

C. Use wedges in pairs, or jacks to bring forms, shoring, or falsework for beams, girders, slabs and other parts of the structure to exact elevations, required camber and uniform bearing before pouring concrete.

D. Construct formwork to the shape, lines and dimensions of the concrete members and tight enough to prevent cement paste leakage. Tie, brace shore, and support forms to resist pressure from any source. Deflection of any member shall not exceed one-eighth inch (1/8 inch). Provide camber in formwork as required for anticipated deflections due to weight and pressures of fresh concrete and construction loads. Where possible, brace forms for exposed concrete without using form ties.

E. Arrange formwork to allow erection in the proper sequence and permit removal without hammering, prying or damaging the concrete. Identify exposed surfaces so that plywood panel and form tie spacing can be carefully arranged.

F. Leave temporary openings necessary for inspection and cleaning before depositing concrete.

G. Form release agent:

1. Thoroughly clean forms and coat with release agent prior to initial use and before each re-use.

2. Apply release agent in strict accordance with manufacturer's directions and coverage recommendations.

3. Avoid starved areas or excessive applications.

4. Apply release agent before reinforcing steel is placed.

3.2 INSTALLATION

A. Openings, reglets, inserts, etc.:

1. Refer to the entire set of project drawings for locations, sizes, and types of all openings, reglets, inserts, anchors, sleeves, cans, electric boxes, conduit, etc.

2. Frame for all openings.

3. Install all cast-in items such as listed in 1 above which are not specifically required to be installed in other sections. Coordinate the installation of items to be installed by other sections.

4. Install all cast-in items securely and in exact locations required. Verify that all required cast-in items have been installed prior to pouring concrete.

B. Set screeds for leveling of finish on slabs. Depress slabs where required to receive special floor finishes. Slope slabs to drain where required, or as shown. Check screed elevations frequently during the pour, for concrete elevations.

C. Install 3/4-inch chamfer at all vertical and horizontal outside corners, unless shown otherwise.

D. Before depositing concrete, remove all debris from the space to be occupied by the concrete and wet thoroughly. Verify that all reinforcement and inserts are secured in position. Remove all free-standing water. Do not leave wood in concrete, except nailers.

E. During concrete placement, check formwork and related supports to ensure that forms are not displaced and that completed work will be within tolerances specified in ACI 347.

3.3 REMOVAL & REUSE OF FORM:

A. Remove forms without damage to the concrete, only after concrete has hardened sufficiently to permit their removal with safety, and the members have attained sufficient strength to safely support the imposed loads. The minimum time before removing forms shall be:

Walls, columns, sides of beams and girders	24 hours*
Horizontal forms of joists, beams and girders (Spans 20 ft. and less)	14 days
Horizontal forms of joists, beams and girders (Spans greater than 20 ft)	21 days
Slabs (Spans 20 ft. and less)	7 days
Slabs (Spans greater than 20 ft.	10 days

*If forms also support formwork for other members, removal time for the latter will govern.

B. Forms may be stripped in less than the specified days, provided all of the following are met:

1. Tests indicate an adequate strength as designated by the Structural Engineer at an earlier time,

2. The Structural Engineer approves the time of stripping, and

3. Immediately after stripping the concrete is sprayed with a clear sealer.

C. Form material may be re-used providing it is straight, free from nails, hardened concrete, or other injurious matter, and has edges and surfaces in good condition.

D. Clean and re-oil or apply form release to wood forms after each reuse.

E. Upon removal of forms, bolts, wires, clamps, rods, etc., not necessary to the work, shall be removed to minimum of 1-1/2 inches from the surface.

F. Forms for exposed concrete surfaces shall be removed in such manner as to preclude damage to finish. Pinch bars and similar tools shall not be used for prying against exposed surfaces.

End of Section

Section 03 20 00

Reinforcing Steel

Part 1. General

1.1 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions, General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to the work of this Section as fully as if repeated.

1.2 DESCRIPTION:

A. Furnish and install all steel reinforcement and related items required for concrete work as shown and specified.

B. All concrete shall be reinforced unless specifically marked "not reinforced" on the drawings. If no reinforcement is shown, reinforce in the same manner shown in similar places. Unless otherwise noted, all reinforcement shall be deformed.

1.3 QUALITY ASSURANCE:

A. Comply with the following codes and standards by the California Building Standards Commission, American Concrete Institute (ACI), Concrete Reinforcing Steel Institute (CRSI) and American Welding Society (AWS):

1. 2016 California Building Code (CBC).

2. ACI 117 “Standard Specification for Tolerances for Concrete Construction and Materials”.

3. ACI 301 "Specifications for Structural Concrete for Buildings".

4. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".

5. ACI 318 "Building Code Requirements for Structural Concrete".

6. CRSI 63 "Recommended Practice for Placing Reinforcing Bars".

7. CRSI 65 "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature".

8. CRSI "Manual of Standard Practice".

9. AWS B2.1 “Welding Procedure and Performance Qualification”.

10. AWS D1.4 "Structural Welding Code-Reinforcing Steel".

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials.

C. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with AWS B2.1.

2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests, and possess a current card.

3. If re-certification of welders is required, re-testing will be Contractor's responsibility.

D. Testing and Inspection:

1. All material shall bear mill tags showing quantity, grade and heat number identification, mill analysis and test reports.

2. Reinforcement placement shall be checked and inspected by the Project Inspector prior to placement of concrete.

1.4 DELIVERY, STORAGE AND HANDLING:

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size, length and heat number.

B. Store reinforcement off the ground on platforms, skids, or other supports.

C. Store reinforcement in a manner that will avoid excessive rusting and coating with grease, oil, and other deleterious materials.

C. Store reinforcement in separate piles or racks to avoid loss of identification after bundles are broken.

1.5 SUBMITTALS:

A. Submit shop drawings showing sizes, grades, schedules, splicing, bending and placing details of reinforcement necessary for complete and accurate location of reinforcement.

B. Details of reinforcement not covered shall be in accordance with ACI 318 and ACI 315.

C. Detailing, fabricating, and spacing of reinforcement shall be equal or superior to ACI 315, unless otherwise indicated.

D. If welding reinforcing bars are indicated on the Drawings, or specified herein, submit the reinforcing bar manufacturer's Certificate of Weldability for each type of reinforcing steel.

E. Contractor shall check all Drawings for anchor bolt sizes and locations, anchors, inserts, conduits, sleeves, and other items, which are required to be cast in concrete.

1. Make necessary provisions as required so that reinforcing steel will not interfere with placement of such embedded items.

F. Reinforcing steel shall not be fabricated or placed before Shop Drawings have been approved and returned to Contractor.

G. Review of shop drawings will not relieve Contractor of responsibility for errors or for failure in accuracy and complete placing of the work.

PART 2 Products

2.1 MATERIALS:

A. General:

1. All reinforcement material: new and free from scale, rust, or coatings, which will reduce bond to concrete.

2. Unless otherwise noted, use only deformed reinforcement.

B. Reinforcing steel: Deformed billet steel bars, ASTM A615, Grade 60, except stirrups and ties #3 or smaller may be Grade 40. ASTM A706 for reinforcement to be welded.

C. Tie wire: 16 gauge or heavier, black annealed steel wire.

D. Welded wire fabric: ASTM A185.

E. Accessories:

1. Chairs, spacers, ties, and other devices: as necessary for proper placement and to adequately support the reinforcing in conformance. Supports shall be steel or precast blocks designed and fabricated in accordance with CRSI standards.

2. Devices such as chairs which will later be exposed: galvanized or otherwise corrosive resistant.

2.2 FABRICATION:

A. Fabricate all reinforcement in strict accordance with the approved shop drawings. Do not use bars with kinks or bends not shown on the drawings or on the approved shop drawings.

B. Reinforcing steel shall be cut and bent cold to exact lengths and shapes to comply with Drawings, reviewed shop drawings, and referenced codes and standards.

1. Contractor is responsible to assure that reinforcement will comply with Drawings, reviewed shop drawings, and referenced codes and standards.

C. Do not bend or straighten the reinforcing steel in a manner that will damage the material.

PART 3 - Execution

3.1 PREPARATION:

A. Prior to installation, carefully inspect the installed work of all other trades and verify that all such work is complete and to the point where this installation may properly commence. Verify that concrete reinforcement may be installed in strict accordance with all referenced standards, the approved shop drawings, and the drawings.

B. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

C. Before placing new reinforcing, clean all dirt, hardened concrete, loose rust, and all other materials which will hinder bond from existing reinforcing extending into the new work.

3.2 INSTALLATION:

A. Prior to placing reinforcing, verify that required formwork is properly and securely installed.

B. Comply with the referenced standards. Place bars as shown, properly secured and supported, in the correct position and so as to prevent movement during concrete pouring. Support bars so that they will not displace when walked upon.

1. Maintain reinforcement at proper distance from form face.

2. Displacement of reinforcement shall be immediately corrected.

3. Tie wires shall be bent away from form.

C. Provide clearances, laps, and splices as shown, and as required in the referenced standards if not shown.

D. Do not bend or straighten the reinforcing steel in a manner that will damage the material.

E. When there has been a delay in placing concrete, reinforcement shall be inspected and, if necessary, cleaned, relocated, and tied at no additional cost to the Owner.

F. Wherever reinforcing bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits, piping, inserts, sleeves, etc., obtain Structural Engineer's approval for method of procedure before concrete is placed.

G. Splices not shown on the Drawings shall be approved by Structural Engineer in writing.

H. Unless permitted in writing by Structural Engineer or these specifications herein, reinforcement shall not be bent after being partially embedded in hardened concrete.

I. Dowels shall be tied securely in place before concrete is deposited.

1. In event there are no bars in position to which dowels may be tied, No. 3 bars (minimum) shall be added to provide proper support and anchorage.

2. Bending of dowels larger than #5 after placement of concrete will not be permitted, unless otherwise indicated on Drawings.

J. Lay welded-wire fabric flat in place. Lap splices shall be made in such a way that the overlapped area equals the distance between outermost crosswires plus two inches. Stagger laps to avoid continuous laps in either direction. Comply with ACI 318 Section 25.5.3 and 25.5.4.

K. In the event of a discrepancy, immediately notify the Structural Engineer. Do not proceed until all such discrepancies are fully resolved.

End of Section

This page intentionally left blank

Section 03 30 00

Cast in Place Concrete

PART 1 - General

1.1 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions, and Special Conditions, General Requirements, and any applicable provisions elsewhere in the Contract shall apply to the work of this Section as fully as if repeated here.

1.2 DESCRIPTION:

A. Furnish and install all cast-in-place concrete and related work as shown and specified.

1.3 RELATED WORK:

A. Concrete Formwork: Section 03 10 00.

B. Reinforcing Steel: Section 03 20 00.

1.4 QUALITY ASSURANCE:

A. Except where different requirements are specified, comply with the following codes and standards by the California Building Standards Commission, American Concrete Institute (ACI), and American Welding Society (AWS):

1. 2016 California Building Code (CBC).

2. ACI 117 “Standard Specifications for Tolerances for Concrete Construction and Materials”.

3. ACI 211.1 “Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete”.

4. ACI 214R “Evaluation of Strength Test Results of Concrete”.

5. ACI 301 "Specifications for Structural Concrete".

6. ACI 304R "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete".

7. ACI 304.2R "Placing Concrete by Pumping Methods".

8. ACI 305R "Hot Weather Concreting".

9. ACI 306R "Cold Weather Concreting".

10. ACI 308.1 "Standard Specification for Curing Concrete".

11. ACI 318 "Building Code Requirements for Structural Concrete".

12. AWS D1.4 “Structural Welding Code- Reinforcing Steel”

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials and testing.

C. Coordination: The Contractor shall be responsible for installation of all accessories embedded in concrete and for provision of holes, etc., necessary for execution of the work of other trades.

D. Testing and Inspection:

1. Testing laboratory will be hired and paid for by Owner to:

a. Review all concrete mixes.

b. Test all concrete ingredients.

c. Test all cylinders.

d. Perform inspection services to meet code requirements for special inspection.

e. Review certificates of compliance, and samples of materials proposed for use.

f. Take samples as required from sources designated by Contractor.

2. Contractor shall:

a. Deliver all cylinders to laboratory carefully and at the proper time.

b. Use weighmaster at batching plant.

c. Hire and pay for testing agency to:

1) Test extra cylinders for Contractor's use.

2) Retest when concrete does not meet specifications.

d. Assist testing laboratory in making all cylinders and slump tests.

3. Provide the testing laboratory free access to all places where concrete materials are stored, proportioned or mixed. All materials, equipment and methods used shall be subject to its inspection, test and approval.

4. The following tests will be taken. Provide all materials to be tested.

   a. Cement will be tested at place of manufacturer if:

      1) Certification from cement manufacturer that the cement proposed for use on the project has been manufactured and tested in compliance with the requirements of specification is not available; OR

      2) Affidavit is not provided by the concrete supplier that identifies the cementitious material used for the project by the manufacturer's lot number, date of shipment from the manufacturer, date of receipt of cementitious material.

   b. Aggregate. See 1.5 below for submittal requirements.

      1) Sieve Analysis: In accordance with "Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregate", ASTM C-136.

      2) Organic Impurities Test: In accordance with "Standard method of Test for Organic Impurities and Sands for Concrete", ASTM C-40-84.

      3) Fineness Test: In accordance with "Standard Method of Test for Amount of Material Finer No. 200 Sieve in Aggregate", ASTM C-117.

   c. Compressive Test Cylinders: Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 150 cubic yards of concrete, or not less than once for each 5,000 square feet of surface area for slabs or walls.

   d. Slump tests: Take slump tests of concrete in accordance with "Tentative Methods of Test for Consistency of Portland Cement Concrete for Pavements or for Pavement Base", ASTM C 143, taken when cylinders are made and at any other time at testing laboratory's discretion.

   e. Lightweight concrete density tests: Acceptance of lightweight concrete in the field will be based on fresh bulk density measured in accordance with ASTM C138. When the fresh bulk density varies by more than 3 pounds per cubic foot, adjust the mixture promptly to bring the density to the desired level.

E. Record of Work: A record shall be kept by the Contractor listing the time and date of placement of all concrete for the structure. Such record shall be kept until the completion of the Project and shall be available to the Architect for examination at any time.

1.5 SUBMITTALS

A. Submit list of all products to be used.

B. Transit-mix delivery slips:

1. Keep record at the job site showing time and place of each pour of concrete, together with transit-mix delivery slips certifying contents of the pour.

2. Make the record available to the Architect for his inspection upon request.

3. Upon completion of this portion of the work, deliver the record and the delivery slips to the Architect.

C. Submit Materials for testing as follows:

1. Aggregates: Submit to the testing laboratory at least 15 days before concrete is required a fifty pound (50 #) sample of fine aggregate and a one hundred pound (100 #) sample of each size of coarse aggregate proposed for use. Select these samples to fairly represent the average quality and grading of the aggregate in question. When aggregates have been approved as acceptable for use, make no change without written permission of the Architect. Maintain stocks of accepted aggregates so that no pour need be interrupted.

2. Cement: Submit mill tests.

D. Prepare on-site samples as specified below.

E. Testing Laboratory will submit design mixes as evidence that the design requirements have been met, but not for formal review and approval.

F. Submit temperature and placement records.

G. Submit design mixes. Prior to pouring any concrete, the Contractor shall submit all concrete mixes to the Architect for approval. Separate mix designs shall be submitted for each type of concrete to be used in the Project. Submittals shall include all information used in designing the mixes. See 2.2 for design procedures.

H. Test Reports: Testing Laboratory will submit reports on tests and inspections performed to Owner, Architect, Contractor, and organization being tested and inspected.

I. Test Reports: "Special Inspection" reports of concrete compression, yield, air content, shrinkage, and slump test by Testing Laboratory.

J. Certificates:

1. Certification that materials meet requirements specified.

2. Certification from vendors that samples originate from and are representative of each lot proposed for use.

1.6 SEQUENCING/SCHEDULING:

A. Schedule and coordinate with suppliers and other trades so that the embedment of items in concrete does not delay the project.

B. Take all precautions to maintain alignment and prevent damage of such items during placement of concrete.

C. Cutting and/or patching made necessary by failure or delay in complying with these requirements shall be at no cost to Owner.

1.7 DELIVERY, STORAGE, AND HANDLING:

A. Hauling time: Discharge all concrete transmitted in a truck mixer, agitator, or other transportation device within 1-1/2 hours after the mixing water has been added.

B. Extra Water: Deliver concrete to the job in exact quantities required by the design mix. Should extra water be required before depositing the concrete, the Contractor's Superintendent shall have sole authority to authorize the addition of water. Any additional water added to the mix after leaving the batch plant shall be indicated on the truck ticket and signed by the person responsible. Where extra water is added to the concrete, it shall be mixed thoroughly for forty revolutions of the drum or 3-1/2 minutes at mixing speed, whichever is greater. Samples for control tests shall be taken after additional water has been thoroughly mixed.

C. Pre-wet lightweight aggregate and keep stockpiled after wetting for at least 12 hours before using.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Use ready-mix concrete conforming to ASTM C94 and ACI 318 Section 26.4.2 - 26.4.4. No on-job mixed concrete will be allowed.

B. Cement: ASTM C150, Type II. Temperature delivered at plant not to exceed 150 degrees F. Use only one manufacturer for all cement unless approved by Architect.

C. Pozzolan (Fly Ash): ASTM C618 Class F or N. Unless noted otherwise on Drawings, amount, measured by weight, shall not exceed 25% of the total cementitious content. Fly ash is not permitted in mixes receiving integral color additives.

D. Aggregates:

1. Fine aggregate: ASTM C33, natural, washed, clean sand. Use same sand for all concrete. Comply with gradation limits specified in standard.

2. Coarse aggregate: ASTM C33. Footing concrete may use standard local aggregate. All other aggregate: Limestone or granite. Comply with the following:

a. Use only hard, durable material from established sources with proven history of successful use in producing concrete with minimum shrinkage, free from harmful amount of clay, shale, or other deleterious substances in amounts greater than those permitted in ASTM C33.

b. Use aggregate containing no thin or elongated pieces. Any piece having a major dimension more than 2-1/2 times the average thickness shall be considered thin or elongated.

c. Comply with gradation limits specified in ASTM C33.

E. Air-entraining Admixture: Conform to ASTM C260.

F. Water Reducing Admixture: Conform to ASTM C494, Types A or D. High range water reducing admixtures types F & G shall not be used unless approved in writing by the Structural Engineer.

G. Accelerating Admixture: Conform to ASTM C494, Types C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

H. Water: Clean, potable, and free of deleterious substances.

I. Miscellaneous Materials:

1. Curing and sealing compound: ASTM C309, Type 1, Class B clear, dissipating, non-yellowing, resin based. W.R. Meadows 1000 series, BASF Kure-N-Seal WB, or approved equal.

2. Grout: Non-shrink to comply with Corps of Engineers Specification CRD -C621 and ASTM C1107. BASF Embeco 885, Burke by Edoco NF NS Grout, or approved equal.

3. Bonding Agent: Larsen Products Weldcrete, W.R. Meadows Intralok, or approved equal.

4. Expansion Joint filler: Resilient and non-extruding type, pre- molded bituminous impregnated fiberboard units complying with ASTM D1751.

5. Waterstops: Rubber type complying with Corps of Engineers Specification CRD – C513 or polyvinyl chloride (PVC) complying with Corps of Engineers Specification CRD – C572.

6. Joint Sealer: ASTM D6690, hot poured type.

7. Vapor Barrier: Polyethylene sheets not less than 10 mils thickness and are resistant to decay when tested in accordance with ASTM E154.

8. Epoxy grout: Master Builder Concresive Standard Liquid LPL.

2.2 DESIGN & MIXES:

A. The quantity of cement and admixture required per cubic yard of concrete is given for estimating purpose only. The contractor shall base his bid on these quantities. The Owner reserves the right to vary the cement content upward or downward, and the contract price shall be adjusted if necessary based on the market price of bulk cement delivered to the batching plant.

B. The exact amount of cement, fine and coarse aggregate, and water to be used shall be determined by the design mix. The actual slump used shall not exceed amounts listed in the table. These proportions shall produce concrete of maximum density, minimum shrinkage and required minimum strength. The concrete shall work readily into the corners and angles of the forms and reinforcement without excessive puddling, spading or vibration and without permitting the materials to segregate or free water to collect on the surface. The amount of water used shall be the minimum consistent with the requirements. In general, the workability shall be improved by adjusting the grading rather than by adding water.

C. A sample load of each of the specified mixes may be poured in the foundation at the earliest possible date to check workability of the concrete. Test cylinders shall be prepared and tested as specified to verify compliance of the concrete with the specifications. All concrete shall develop the specified minimum strength. Adjustments will be made if test results warrant changes.

D. Basis for mix designs shall be as follows:

Class	Max. Size Aggregate	28 Day Comp strength fc	Cement Sks/Yd.Min.	Maximum Slump
A	1-1/2 in.	3,000	6.60	4 in.
B	3/4 in.	3,000	7.10	4 in.*

* Slump may be increased to 5 in. only if necessary in areas of congested bars.
Note: Listed quantity of cement per yard of concrete is for cost estimation purposes only.

E. Use the various classes of concrete mixes for the following locations:

1. Class A: All footings (at Contractor's option, Class B may be used).

2. Class B: All concrete not otherwise specified.

F. Class B concrete shall include 4% (plus or minus 1%) entrained air.

G. Measure fine and coarse aggregates separately. The method of measuring aggregates shall be subject to the approval of the testing laboratory and shall be such that all ingredients can be uniformly and accurately controlled and easily checked.

H. The batching plant shall be equipped with an electric metering device capable of determining moisture content of sand. This device shall be subject to the approval of the testing laboratory.

I. Proportion lightweight concrete mixes to meet specified density by the calculated equilibrium method in ASTM C567. Correlate equilibrium density with the fresh bulk density of concrete. Use the fresh bulk density as the basis for acceptance during construction.

J. No admixtures will be allowed, except as specified herein, unless authorized by the Structural Engineer. All requests for approval or substitution must be made by the Contractor and be accompanied by sufficient information and test data for evaluation. No calcium chloride shall be added to concrete. Dosage shall be per manufacturer’s recommendation.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine units of work to be placed and verify that:

1. Construction of formwork is complete.

2. Required reinforcement, inserts, and embedded items are in place.

3. Form ties at construction joints are tight.

4. Areas to receive concrete are free of debris and excess water.

B. Thoroughly clean the areas to ensure proper placement and bonding of concrete.

C. Thoroughly clean all transporting and handling equipment.

D. Notify Architect and Project Representative at least 48 hours before concrete will be placed.

E. Ensure availability of sufficient labor personnel, equipment, and materials to place concrete correctly in accordance with schedule. Adequate scaffolding, ramps, and walkways shall be provided so that personnel and equipment are not supported by in- place reinforcement.

F. Protect finished surfaces adjacent to areas to receive concrete.

3.2 MIXING:

A. In general, provide ready mixed concrete in compliance with the referenced ACI standards and ASTM C94, as modified herein.

B. Mix all concrete mixed in transit mixer for a period of not less than 10 minutes at a peripheral drum speed of 200 ft. per minute. At least 3 minutes of the mixing period shall be at the job site.

C. Start the discharge of concrete not more than 45 minutes after the introduction of mixing water. Complete placing of concrete within 90 minutes of the first introduction of water into the mix.

D. Do not add water to the mix after leaving the plant without the specific approval of the Project Representative or Architect. Upon his approval, water may be added as long as slump does not exceed that specified and the designed water/cement ratio is not exceeded.

E. Do not use lightweight concrete for which the fresh bulk density varies by more than four pounds per cubic foot from the required fresh bulk density.

3.3 TEMPERATURE CONTROLS:

A. In general, comply with the following temperature limitations:

1. Maximum temperature of concrete at time of placement: 85 degrees F.

2. Minimum temperature of concrete at time of placement: 50 degrees F.

B. Should the ambient temperature at time of concrete placement exceed 85 degrees F, or should it be expected to rise above this temperature for the 3 days following placement, submit a program for hot weather concreting as recommended in ACI 305R. Do not place concrete under these conditions unless such a program has been approved by the Structural Engineer. Do not add cement to the mix at a temperature higher than 150 degrees F. The program may include such treatment as follows:

1. Cooling aggregates.

2. Using cold water or crushed ice for mixing.

3. Limiting mixing speed.

4. Special admixtures or curing procedures.

5. Protecting or cooling reinforcement.

C. Should the ambient temperature at time of concrete placement be below 50 degrees F or should it be expected to drop below this temperature for the 3 days following placement, submit a program for cold weather concreting as recommended in ACI 306R. Do not place concrete under these conditions unless such a program has been approved by the Structural Engineer. Do not permit concrete to freeze for 7 days following placement. The program may include such treatment as follows:

1. Heating aggregates.

2. Heating water.

3. Heating forms.

4. Enclosing area of pour.

5. Special admixtures or curing procedures.

D. Keep accurate and detailed records of concrete pour locations, temperatures of air and concrete, and curing methods. Turn records over to Architect at completion of work.

E. Cure some test cylinders under conditions same as the placed concrete is if so requested by Architect or testing laboratory.

3.4 PLACING - GENERAL:

A. Keep a record of the time and date of placing all concrete in each portion of the project. Make this record open to the inspection of the Architect at any time.

B. Carry on concrete placing, once started, as a continuous operation until the section of approved reinforcement, size and shape is completed. Use pour cut offs of approved details and locations.

C. Handle concrete as rapidly as practical from the mixer or transporting unit to the place of final deposit by methods which prevent segregation or loss of ingredients. Deposit it as nearly as practical, in its final position to avoid re-handling or flowing. Do not drop concrete freely where reinforcing bars will cause segregation, no more than five (5) feet. Deposit concrete to maintain a plastic surface approximately horizontal. Do not deposit concrete that has partially hardened.

D. In pouring columns, use openings in the forms, elephant trunks, or other approved devices which will permit the concrete to be placed without segregation and the accumulation of hardening concrete.

E. Install such devices so the concrete will be dropped vertically. Provide pour holes in the forms to the extent necessary to insure filling or to allow necessary inspection.

F. Consolidate all concrete thoroughly using approved mechanical vibrators.

1. Use Mechanical vibrators, having a minimum frequency of 10,000 rpms, at each point of dump, and keep a stand by vibrator in good working condition, but not in use, on the job until all concrete is placed. Vibrators shall not be used to move concrete laterally.

2. Internal vibration must be direct action in the concrete and not against forms or reinforcement. Vibrate each pour until the water shows indications of rising, but not until the water has risen.

3. Along the faces of the forms, use suitable tools during the pour to force large particles away from the forms and bring mortar to the surface of the forms. In addition, when approved by the Structural Engineer, external form vibration may be used. Take all appropriate means to provide fully filled out, smooth, clean and properly aligned surfaces free from pockets and blemishes.

4. Tamp slabs with a jitterbug to depress the rock and push float with a fill float as necessary. Take care at all times that the wet slab meets the screeds accurately and does not rise above or fall below them.

5. Do not vibrate lightweight concrete to the extent that large particles of aggregate float to the surface.

G. In general, place concrete only against firm surfaces which have been sufficiently dampened to prevent rapid absorption of water from freshly poured concrete.

H. Moisten earth and spray forms and reinforcement with water before placing concrete.

I. Keep forms and reinforcement clean above placement line by removing clinging concrete with wire brush before placing next lift.

J. When temporary spreaders are used in the forms, the spreaders shall be removed as their service becomes unnecessary.

3.5 CONSTRUCTION/CONTROL JOINTS:

A. Joints shall be located and constructed as indicated on the Drawings or as approved by the Structural Engineer.

B. All reinforcement shall be continuous across joints; except that reinforcement or other fixed metal items shall not be continuous through expansion joints, or through construction joints in slabs on grade unless noted otherwise on the Drawings.

C. Construction Joints:

1. Unit of operation shall not exceed eighty (80) feet in any horizontal location.

2. Sandblast the entire top surface of all horizontal construction joints with coarse sand to clean and roughen the joint for bond to next mortar matrix. Clean away all drippings, sand, debris, etc., so next pour is placed on clean, solid, rough surface.

3. Water-blasting or other means can be used in lieu of sanblasting.

4. Fresh concrete shall not be placed against adjacent hardened concrete until it is at least twenty-four (24) hours old.

D. Control Joints in slabs:

1. Control joints shall be produced by forming a weakened plane in the slab by the use of rigid inserts impressed in the concrete during placement, snap- out plastic joint forming inserts, or concrete sawing. Regardless of method used, it shall be 1/4 the depth of the slab thickness and between 1/8 and 3/16 inch wide.

3.6 TOLERANCES:

A. Unless otherwise specified herein or is shown on the Drawings, permissible deviations from established lines, grades, and dimensions shall be those specified in ACI 117.

B. Unless otherwise noted, place slabs to the following tolerance: 1/8 inch in ten (10) feet. Also no more than 1/8-inch maximum deviation above or below the established datum lines.

C. Areas with floor drains: Unless detailed otherwise, pitch floors carefully to floor drains so as to afford an even fall from all parts of the room using screed extending from the flow drain in fan shape.

D. Construct new concrete columns to the following tolerances for all exposed surfaces:

1. In any 10' of length: 1/4" out of plumb.

2. Member thickness: -1/4", +1/2".

3.7 GROUTING

A. Grout where required; proportion and install in accordance with manufacturer's recommendations to produce a grout which will not shrink and which will attain a minimum compressive strength of 4000 pounds per square inch at seven (7) days.

B. Where grout will not be encased in concrete, use non-staining, non-metallic type.

C. Grout shall not be re-tempered or subjected to vibration from any source.

3.8 SACKING:

A. Perform where required immediately after forms are removed with a mixture of fine sand and cement, thoroughly rubbing the entire surface, filling all small holes and irregularities and producing a uniform appearance throughout the surface.

B. Sacking is in addition to the patching and repair work required for all surfaces in Article 3.11 below.

C. Architect may require sacking any concrete surfaces which he determines are unacceptable, at no extra cost to the Owner.

3.9 CURING, PROTECTION & SEALING

A. Protect concrete from injurious action of the elements and defacement of any nature during construction operations. Keep all forms sufficiently wet to prevent drying out of concrete. Protect slabs and exposed corners of concrete from traffic or use which will damage them in any way.

B. Curing: Immediately following placing, keep concrete continuously moist by means of one of the following methods:

1. Interior Slabs: Apply membrane curing compound to freshly poured concrete floors following manufacturer's directions. Surface must be clear and free of oil, grease, dirt or foreign matter. Spray apply to concrete surfaces for curing within approximately one to two hours after completion of finishing operations and/or immediately after disappearance of the "sheen" of surface moisture. Coat surfaces uniformly leaving no pinholes or gaps, at a rate not to exceed 200 sq. ft. per gallon for broom finished surfaces. Do not puddle or leave heavy surface film.

a. At integrally colored or trowel applied color hardener curing shall be accomplished using Schofield "Colorwax" at exterior conditions and "Colorcure" at interior conditions, applied in accordance with the manufacturer’s instructions.

2. Interior Slabs, Concrete Finish: Near completion of job, remove dirt, grease, oil, etc., by sanding mopping and wet vacuuming. Allow to dry thoroughly. Apply membrane curing compound for sealing by brush, airless spray or Squeegee following manufacturer's directions. Apply small amount on surface and immediately work it into pores. Do not let it puddle and do not cover more area than can be worked in 10-15 minutes as setting will start. Use without thinning. Apply in two coats at the rate of 600 sq. ft. per gallon each. Allow first coat to dry a minimum of 24 hrs.

3. Interior Slabs to Receive Finish Flooring or Carpet: Complete as in Item 1 above. No additional sealer required near job completion. Clean slabs of oil, grease, dirt, etc.

4. Exterior Slabs: Complete as in Item 1 above. No additional sealer required near job completion. Clean slabs of oil, grease, dirt, etc.

5. Walls, columns and other vertical surfaces of concrete that have had their formwork removed, shall be kept continuously moist for a period of 14 days, by means of water being mist applied a minimum of three times each day, or by application of a membrane as specified above for slabs and flatwork. Concrete that has had the formwork left in place for a minimum of 7 days will not require additional moisture application or membrane treatment.

3.10 CONCRETE FINISHES:

A. Slab Finish:

1. General: Uniformly spread, screed and float concrete.

2. Trowel: Apply two (2) steel troweling operations at surfaces to receive carpet, resilient materials, thin-set tile and where left exposed, finished to achieve burnished surface. Follow second troweling with light brooming perpendicular to direction of traffic to form non-slip surface.

3. Broom: Apply at exterior walks, perpendicular to direction of traffic flow.

B. Joints: Mark off exposed joints, where indicated, with ¼ inch radius edging tool. Markings to be clean cut, straight and square with respect to border. Tool edges of exposed expansion and contraction joints, border edges, and wherever concrete adjoins other material or vertical surfaces.

3.11 PATCHING:

A. Repair defects in concrete work as follows: Chip voids to depth of at least one (1) inch or to remove all loose material with the edges perpendicular to the surface and parallel to form markings. Fill voids, surface irregularities, chipped areas, etc., by patching, gunite and/or rubbing, as directed. Duplicate the appearance of unpatched work. Prepare a sample of a repaired condition for approval by Architect before proceeding with all of this work.

End of Section

This page intentionally left blank

Section 05 12 00

Structural Steel

PART 1 - General

1.1 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General conditions and Special Conditions, General Requirements, and any applicable provisions elsewhere in the Contract documents shall apply to the work of this Section as fully as if repeated here.

1.2 DESCRIPTION:

A. Work Included:

1. All structural steel, shop galvanizing and painting, field touch-up, and cleaning of steel which is not painted.

2. Include all steel items embedded in poured in place concrete such as anchor bolts, nuts, plates, etc.

3. All labor, material and equipment required to supply and install structural steel, as indicated on the drawings and specified herein.

4. Include miscellaneous metals to match existing, such as railings.

1.3 RELATED WORK

A. Cast-in-Place concrete: Section 03 30 00.

B. Paints and Stains: Section 09 91 23.

1.4 QUALITY ASSURANCE:

A. Except where different requirements are specified, comply with provisions of following codes, specifications and standards by the California Building Standards Commission, American Institute of Steel Construction (AISC), American Welding Society (AWS), and The Society for Protective Coatings (SSPC):

1. 2016 California Building Code (CBC).

2. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges".

3.	AISC 360	“Specification for Structural Steel Buildings", including the Commentary and Supplements thereto as issued.
4.	AISC 341	“Seismic Provisions for Structural Steel Buildings”.
5.	AISC 358	“Pre-qualified Connections for Special and Intermediate Steel Moments Frames for Seismic Applications”.
6.	AISC	"Specifications for Structural Joints using ASTM A325 or A490 Bolts", approved by the Research Council on Structural Connections.
7.	AISC	“Architecturally Exposed Structural Steel", (supplement to Modern Steel Construction, May 2003).
8.	AWS B2.1	“Welding Procedure and Performance Qualification”.
9.	AWS D1.1	"Structural Welding Code- Steel".
10.	AWS D1.8	"Structural Welding Code for Seismic Applications”.
11.	SSPC PA-1	“Shop, Field, and Maintenance Painting”.
12.	SSPC SP-2	“Hand Tool Cleaning”.

Where provisions of pertinent codes and standards conflict with this Specification, the more stringent will apply.

B. Comply with the referenced ASTM standards for materials and testing.

C. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with AWS B2.1.

2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests, and possess a current card.

3. If re-certification of welders is required, re-testing will be Contractor's responsibility.

D. Shop Fabrication:

1. Work shall be fabricated in an approved fabrication plant recognized by the project’s local building jurisdiction per CBC Section 1704.2.2.

E. Testing and Inspection:

1. Contractor shall provide testing laboratory with complete identification, mill analysis and test reports of steel to be used. The testing laboratory will verify steel source and mill tests. In case of inadequate identification (judged by the testing laboratory), the contractor shall provide samples and pay for tests that would include tension and elongation test, bend or flattening test, and chemical analysis of unidentified steel material. See Section 2203.1 of the CBC.

2. The contractor shall notify the Owner and testing laboratory well in advance of the shop fabrication of any unit to allow time to arrange testing and inspection.

3. The testing laboratory shall inspect high strength bolting, check shop and field welding and may use any aid to visual inspection it considers necessary.

4. The testing laboratory shall check shop fabrication and field erection for conformance to the drawings and the referenced AISC documents.

5. In case of any failures of any tests made, the Contractor shall pay for further testing until material or work meets requirements.

6. Testing laboratory will inspect prime paint for thickness, coverage and compliance with specifications.

F. Verification of Accuracy:

1. Engage and pay for a registered civil engineer or licensed land surveyor to check the alignment, plumbness, elevation, and overall accuracy of the erected framing at an appropriate stage during construction and at completion of erection. He shall submit written verification that the entire installation is in accordance with the contract documents.

G. Allowable Tolerances:

1. Unless otherwise specified, furnish and install all structural steel to comply with ASTM A6 and AISC Code of Standard Practice.

2. Unless otherwise specified, install all steel which remains exposed to comply with the referenced AISC Specification “Architecturally Exposed Structural Steel.”

3. Further, for all columns and beams, the attention of the Contractor is directed to Section 6.4.2 of the referenced "Code of Standard Practice for Steel Buildings and Bridges” which states that *“completed members shall be free of twists, bends, and open joints. Sharp kinks or bends shall be cause for rejection.”* Take special care that column base plates are parallel and perpendicular to faces of columns and that bolt holes are accurately placed.

1.5 SUBMITTALS:

A. Product data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.

2. High-strength bolts (each type), including nuts and washers.

3. Structural steel primer paint.

4. Shrinkage-resistant grout.

5. Load indicating washers at high-strength bolted connections.

B. Shop Drawings:

1. Contractor shall submit shop drawings prepared under supervision of a professional engineer registered in the State of California, including complete details and schedules for fabrication and assembly of structural steel members' procedures and diagrams. No work shall be started until shop drawings have been reviewed and returned.

2. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld.

a. Designate members and connections that are specified as "SLRS" on the Drawings.

b. Designate locations of shop welds that are specified as "Demand Critical Welds" on the Drawings.

c. Designate locations and dimensions of "protected zones".

d. Gusset plates shall be drawn to scale.

3. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.

C. Certificates:

1. Structural Steel: Submit certified copies of mill test reports indicating the physical and chemical properties of all structural steel used. Correlate individual heat numbers with each specified structural section.

2. High Strength Bolts (A325): Submit certified copies of inspection test reports for bolts by the Production Lot Method, indicating proof load, tensile load, tensile strength (wedge test), and hardness. Any lot without satisfactory test reports shall be re-tested at the Contractor's expense.

3. Direct tension indicator washers: Submit certified copies of inspection test reports for washers by the Production Lot Method, showing compliance with ASTM F959.

4. Submit 2 copies of certified verification of accuracy.

D. Submit Welding Procedure Specifications (WPS) for all welding, including welding done using AWS pre-qualified procedures.

E. Record Drawings:

1. After all work of this section has been completed, correct or revise the shop drawings and erection diagrams to correspond with the actual installation made. Provide two sets of prints showing the corrected condition to the Architect for the Owner's use.

F. See the General Conditions for Submittal General Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.7 JOB COORDINATION:

A. Steel contractor shall cooperate and coordinate his work with other contractors for anchor bolts and other required inserts, templates, etc. Align this work prior to installation of other materials.

PART 2 - Products

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, transient and application of surface finishes.

B. Structural Steel Wide-flange Shapes: ASTM A992, Grade 50.

C. Other Rolled Shapes, Plates and Bars: ASTM A36.

D. Pipe Columns: ASTM A53, seamless, Grade B.

E. Structural Tubing: ASTM A500 Grade B.

F. Anchor Bolts: ASTM F1554, Grade 36, unless stated otherwise.

G. Threaded Rods: ASTM A193, Grade B7.

H. Machine Bolts: Where machine bolts (M.B.) are called for, they are to be ASTM A307 with full shank bearing wherever possible. Where this is impracticable, threads of not more than 2/3rds of the thickness of the piece on one side of the shear plane will be permitted.

I. Electrodes for Welding: Comply with AWS Code, E70xx.

J. Structural Steel Primer Paint: Submit fabricator's standard rust-inhibiting primer for approval.

1. Exposed steel: Tnemec V10-99, Rust-Oleum 1069 Heavy Duty Primer, or approved equal. Finish paint color per Owner.

K. Non-shrink Grout: Comply with Corps of Engineers Specification CRD -C621 and ASTM C1107; BASF Embeco 885 or Masterflow 928, Dayton Superior Edoco NF NS Grout, or approved equal.

L. Galvanizing: ASTM A123.

M. Galvanized Steel Bar Grating: As manufactured by McMaster-Carr, McNichols, or approved equal.

N. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with the Military Specification MIL-P-21035 (Ships).

2.2 FABRICATION

A. Shop Fabrication and Assembly:

1. Fabricates and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

2. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

3. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in connecting welding work.

C. Holes for Other Work:

1. Provide holes required for securing other work to structural steel framing as shown on final shop drawings.

2. Threaded nuts welded to framing, and other specialty items to as indicated to receive other work.

3. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 SHOP PAINTING

A. General: Shop prime paint structural steel, except as follows:

1. Members or portions of members to be embedded in concrete. Paint embedded steel which is partially exposed or exposed portion and initial 2" of embedded areas only.

2. Surfaces to be galvanized.

3. Within 1/2 inch of the toe of welds prior to welding.

B. Surface preparation: After inspection and before shipping, clean steel work to be painted in compliance with SSPC SP-2 "Hand Tool Cleaning", SP-3 "Power Tool Cleaning", or SP-6 “Commercial Blast Cleaning”. Remove oil, grease, and similar contaminates in compliance with SSPC SP-1 “Solvent Cleaning”.

C. Painting: Immediately after surface preparation, apply structural steel primer in accordance with manufacturer's instructions and at a rate to provide a uniform dry film thickness of not less than 2.0 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces.

2.4 GALVANIZING

A. Galvanize structural steel units, which will be installed with an exposure to the weather upon completion of fabrication, by the hot- dip method. Provide not less than 1.8 ounces of zinc coating per square foot of surface, in accordance with ASTM A 123, unless otherwise noted. Galvanize all exposed bolts or other connectors. Field repair damaged galvanized surfaces and welds on galvanized work with ZRC Worldwide Gavilite, Clearco Zinc Rich Primer, or approved equal.

PART 3 - EXECUTION

3.1 INSPECTION

A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until satisfactory conditions have been corrected in a manner acceptable to the Erector.

B. Erector shall inspect and approve the location and alignment of all structural embedments and templates prior to pouring of concrete.

3.2 HOISTING AND ERECTION:

A. Steel contractor shall include provision for all hoisting and erection equipment necessary to complete his operations.

B. Owner will provide electrical power. Steel contractor shall provide any additional electrical devices, equipment, and conductors from that point necessary to perform his work and shall be responsible for their compliance with all regulations.

C. Steel contractor shall provide and maintain any and all safety railings, toe boards, etc. required for the erection of steel framing floor plates and shall leave the safety devices around all perimeters of floor areas for the contractor's use during the remainder of construction as required. Contractor will disassemble and store this material, when not required, for pick-up by the Steel Contractor.

D. Temporary Shoring and Bracing: Steel Contractor shall be responsible for bracing the erected frame in a manner which will assure proper alignment for the steel frame. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds. Remove temporary members and connections when permanent members are in place and final connections are made.

E. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

F. Anchor Bolts:

1. Furnish anchor bolts and other connections required for securing structural steel to in-place concrete work as indicated on drawings to be part of this contract.

2. Furnish templates and other devices as necessary for pre-setting bolts and other anchors to accurate locations.

G. Setting Bases and Bearing Plates:

1. Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surfaces of base and bearing plates.

2. Set loose and attached base plates and bearing plates for structural member on wedges or other adjusting devices.

H. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

I. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

J. Field Assembly:

1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastened. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

2. Level and plumb individual members of structure within specified AISC tolerances.

3. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed in service.

4. Splice members only where indicated and accepted on shop drawings.

K. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

L. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

M. Gas Cutting: Do not use gas-cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only in secondary members which are not under stress, as acceptable to Engineer. Finish gas-cut sections equal to a sheared appearance when permitted.

N. Touch-up Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.

2. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

3.3 WORKMANSHIP:

A. Fabrication and erection of all steel shall conform to the tolerances and other provisions of the AISC Code of Standard Practice. Where members are permanently exposed, conform also to the provisions of the AISC Specification for Architecturally Exposed Structural Steel.

B. It is specifically stipulated that burned holes are not acceptable.

C. All details shall conform to details shown on the drawings or, where not shown, shall be consistent with those shown or based on the specifications already referred to and as illustrated in the handbook "Steel Construction" of the American Institute of Steel Construction, latest edition.

D. Provide all temporary bracing, shoring, planking, etc. required to erect the frame. The contractor shall coordinate the work and provide the temporary supports necessary for completing the work safely and without unnecessary delays.

E. Damage to members in shipment or handling shall be corrected as directed by the Structural Engineer.

3.4 WELDING:

A. Follow applicable sections of A.W.S. specifications.

B. Welds shall be made by operators whose qualifications have been approved by Owner's testing laboratory representative and as prescribed in A.W.S. "Qualification Procedure: (except welds which do not carry calculated stress). Details of joints shall comply with requirements for A.W.S. joints accepted without qualification tests.

C. Unless noted otherwise, weld thickness is minimum size specified in Section J2 of AISC 360. Butt welds are full penetration welds (use back-up plate or chip and back weld). Welds not required to be full penetration welds are specifically noted on drawings.

End of Section

Section 05 30 00

Metal Decking

PART 1 - General

1.1 PROVISIONS:

A. All of the provisions of the General Conditions, Supplementary General Conditions and Special Conditions - General Requirements, and any applicable provisions elsewhere in the Contract Documents shall apply to the Work of this Section as fully as if repeated here.

1.2 DESCRIPTION:

A. Work Included:

1. Furnish and install all metal decking, accessories, closures, edge forms and supports normally furnished with metal decking.

B. Related work described elsewhere: Structural Steel -- Section 05 12 00.

1.3 QUALITY ASSURANCE:

A. Except where different requirements are specified, comply with provisions of following codes, specifications and standards by the California Building Standards Commission, American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI), American Welding Society (AWS), Steel Deck Institute (SDI) and Underwriter's Laboratories, Inc. (UL):

1. 2016 California Building Code (CBC).

2. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges".

3. AISI "North American Specification for the Design of Cold- Formed Structural Steel Members".

4. AWS B2.1 "Welding Procedure and Performance Qualification".

5. AWS D1.3 "Structural Welding Code- Sheet Steel"

6. SDI 31 "Design Manual for Composite Decks, Form Decks and Roof Decks"

7. SDI MOC2 "SDI Manual of Construction with Steel Deck".

8. UL "Fire Resistance Directory".

Comply with the referenced ASTM standards for materials.

B. Furnish decking which has approval as represented by an International Code Council Evaluation Service (ICC-ES) report.

C. Manufacturer shall be member of Steel Deck Institute.

D. For roof deck, comply with Industrial Risk Insurer's requirements.

E. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with AWS B2.1.

2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests, and possess a current card.

3. If re-certification of welders is required, re-testing will be Contractor's responsibility.

F. The testing laboratory hired by the Owner shall visually check the installation for conformance with the design drawings and shall recommend to the Structural Engineer any additional testing it deems necessary. Retesting due to failure of materials to pass tests will be paid for, until passing, by Contractor.

1.4 SUBMITTALS:

A. Shop drawings shall be submitted to Structural Engineer for review showing details of layout and fabrications. Fabrication and/or installation shall not begin until these drawings have been reviewed and approved.

B. Submit Welding Procedure Specifications (WPS) for all welding, including welding done using AWS pre-qualified procedures.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Store materials to permit easy access for inspection and identification. Keep deck sheets and accessories off ground, using pallets, platforms, or other supports. Protect deck sheets and accessories from erosion and deterioration.

C. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials as directed.

D. Do not use deck units for storage or working platforms until permanently secured in position. Construction loads must not exceed carrying capacity of the deck.

PART 2 - Products

2.1 MANUFACTURERS

A. Verco Manufacturing Company, ASC Profiles, or approved equal.

2.2 MATERIALS:

A. Decking:

1. Type and gage as indicated on the Drawings.

2. Cold Rolled: ASTM A1008 grade 33 prime painted, Fy=38 KSI minimum.

   Galvanized: ASTM A653 G60 grade 33, Fy=38 KSI minimum. Use G90 grade 50 at exterior exposed conditions. Galvanizing process is in accordance with ASTM A924.

3. Provide deck units of sufficient length to span three or more spacings where possible.

4. To ensure positive venting from the underside, provide slotted or perforated steel deck to receive concrete fill.

B. Apply finish coating per deck manufacturer's instructions.

C. Shear Connectors (studs): Conform to ASTM A-108, Grades C1010 – C1020.

D. Mechanical Fasteners (screws): ITW Buildex or Hilti.

E. Miscellaneous edge forms, closures, accessories, and supports: Galvanized steel of configurations required for complete installation.

F. Wherever fire resistance rated assemblies are required, provide UL-listed units. Identify steel deck bundles with labels bearing the UL mark. UL Design Number: As indicated on the Drawings.

PART 3 - Execution

3.1 INSTALLATION:

A. Provide floor deck to span over at least four supports (three spans). Where this is not possible as reviewed with the Structural Engineer, deck shall span over at least three supports (two spans). Locate deck ends over supports only.

B. Place units accurately aligned with complete and solid bearing at supports, two inches minimum. Tack weld closures and flashings.

C. Fasten deck units to steel support members as indicated on the Drawings.

1. Make plug welds of metal deck to steel members as shown. Use only welders qualified in welding light gauge metal.

2. Provide neoprene washers where mechanical fasteners are used and the connection will be exposed in the deck's finished construction.

D. Cut openings and holes neatly. Where required for erection loads or floor loading in completed building, reinforce openings with welded plates or structural sections. Unless otherwise detailed, install the minimum detailed opening edge closures and stiffeners at all openings.

E. Install shear connectors (studs) of sizes and numbers per length of beam as shown. Shear connector welds through metal decking may be substituted for required metal deck welding on a one-to-one basis if approved by the Structural Engineer and testing laboratory welding inspector.

F. Do not support suspended ceilings, light fixtures, ducts, utilities, or other loads from the steel deck unless indicated on the Drawings or approved by the Structural Engineer.

G. For decks to receive concrete fill, prior to placement of concrete, inspect installed decking to ensure that there has been no permanent deflection or other damage to decking. Replace decking which has been damaged or permanently deflected as approved by the Structural Engineer.

1. Place concrete in accordance with Construction Practice of SDI 31 and Section 03300-Cast in Place Concrete.

H. For roof deck, upon completion of installation, sweep surfaces clean and prepare for installation of the roofing.

End of Section

Section 05 40 00

Metal Framing

Part 1. General

1.01 Description

A. Section Includes: Provision of light gauge steel stud and joist framing. Work includes, but is not necessarily limited to the following:

1. Load-bearing steel stud framing at exterior walls.
2. Interior stud wall and ceiling framing with studs 18-gauge and heavier.
3. Framing accessories.

B. Related Sections:

1. Section 05 12 00 - Structural Steel

1.02 REFERENCES

A. Requirements of the GENERAL CONDITIONS apply to all Work in this Section.

B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply).

1. California Building Code (CBC), 2016 Edition.
2. American Society for Testing and Materials (ASTM).
3. Federal Specifications (FS).
4. American Welding Society (AWS) D1.3: "Structural Welding Code - Sheet Steel."
5. American Iron and Steel Institute (AISI): "Specifications for the Design of Cold-Formed Steel Structural Members."
6. Metal Lath Association (MLA): "Specifications for Metal Lath and Furring."
7. Steel Structures Painting Council (SSPC): "Painting Manual."

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with fire-resistance ratings as indicated and as required by governing authorities and codes.
2. Provide materials, accessories, and application procedures which have been listed by an approved testing agency or tested according to ASTM E119 for the type of construction shown.
3. Comply with requirements of CBC Section 2202.2.3 for design and identification of cold-formed steel.
4. Framing system shall conform to ICBO Report for stud gauge and spacing for all wall conditions.

B. Steel stud system shall conform to referenced AISI documents.

C. Installer: Company specializing in performing the work of this Section with minimum 3 years documented experience.

D. Welders: Qualified in accordance with AWS D1.3 for welding process, position, type of weld and type of steel.

1.04 SUBMITTALS

A. Submit in accordance with provisions of the General Conditions, “Submittals.”

B. Structural Calculations and shop drawings, stamped and signed by a California registered Professional Engineer (Civil or Structural), qualified and experienced in the design of metal framing systems.

C. Shop Drawings: Include plans and elevations at not less than 1/4 inch to 1’0” scale, and details at not less than 3-inches to 1’0” scale.

1. Indicate wall stud and ceiling joist layout.
2. Indicate component details, framed openings, bearing, anchorage to structure, type and location of fasteners and accessories, and items required of related work for complete installation of steel stud system.

D. Product Data: Manufacturer’s ICBO report, specifications and installation instructions for steel studs, fasteners, and accessories.

E. Experience of installer if requested by Architect.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Procedures: In accordance with the General Conditions, “Materials and Equipment.”

B. Protect framing from rusting and damage.

C. Deliver in manufacturer’s unopened containers or bundles fully identified with name, brand, type and grade.

D. Store inside a dry, ventilated space, and protect framing from rust and damage.

1.06 JOB CONDITIONS

A. Coordinate stud sizes and layouts with the work of the various trades. Where ductwork, conduit, piping, casework, and other such items exceed indicated available space, increase stud sizes or make other minor modifications as necessary to accommodate the work at no change in cost of the Work.

Part 2. Products

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Any member of the Steel Stud Manufacturer’s Association (ICC ER-4943P).

2.02 MATERIALS

A. Sheet Steel: ASTM A653, Grade 50 and 33.

B. Studs: Cee studs with punched web, unless otherwise noted, formed of gauge as specified on the Drawings.

1. Provide ASTM A653, Grade 50 and 33, shop-coat with manufacturer’s standard rust-inhibitive primer after fabrication.
2. Minimum properties for each size stud shall be as follows, unless otherwise indicated on Drawings.

Size (inches)	Gauge	Flange Width (in.)	Moment of Inertia (in.)	Section Modulus (in.)	Grade (ksi)
3-5/8	16	1-5/8	0.873	0.481	50
3-5/8	18	1-5/8	0.710	0.392	33
6	16	1-5/8	2.860	0.953	50
6	18	1-5/8	2.316	0.772	33
8	16	1-5/8	5.736	1.434	50

C. Floor Tracks: Formed from same gauge and grade of steel as used for studs: 1-1/4-inch legs.

D. Provide ASTM A653, Grade D, or shop-coat with rust-inhibitive primer after fabrication.

E. Ceiling Tracks: Formed from 16-gauge steel, 2-inch legs.

F. Partition Stiffeners or Bridging: Unpunched channel shape, formed of 16-gauge steel to required dimensions.

G. Powder-Driven Fasteners:

1. Tempered-steel pins with special corrosive-resistant plating or coating.

2. Pins shall have guide washers to accurately control penetration, minimum 1-1/4 inch.

3. Fastening shall be accomplished by low-velocity, piston-driven, powder-accentuated tool.

4. Pins and tool shall be Hilti Fastening Systems DN-32-P8 (ICC ER-1663) or equal product substituted per the General Conditions.

H. Expansion Bolts: Hilti Fastening Systems “TZ Concrete Anchors” (ICC ESR-1385), or equal product substituted per the General Conditions.

I. Welding Electrodes: AWS low hydrogen, rod number and diameter as approved by the Owner’s Testing Agency.

J. Bracing: Provide cross diagonal 3-inch wide by 14-gauge straps, welded as indicated on the Drawings and per stud manufacturer’s specifications for frame stability.

K. Touch-up Primer for Galvanized Surfaces: SSPC Paint 20 zinc rich.

L. Metal Screws: Self-drilling and self-tapping; No. 8 pan head and larger as noted on Drawings.

3.01 PREPARATION

A. Coordinate details and requirements of other Work which adjoins or fastens to studs and requires backing or special support framing included in this Section.

1. Items requiring backing or support include, but are not necessarily limited to casework, wall-specialties, and similar items.

2. Obtain Architect's approval of backing method proposed to satisfy requirements of this Section which differs from methods noted or shown.

3.02 EXAMINATION

A. Examine all parts of the supporting structure and the conditions under which studs will be installed.

B. Notify the Architect, in writing, of any conditions detrimental to the proper and timely completion of the Work.

C. Do not proceed with the installation of steel studs until unsatisfactory conditions have been corrected.

3.03 INSTALLATION

A. Tracks shall be securely anchored to supporting structure, with fasteners specified at not more than 24 inches on center.

B. Complete, uniform, and level bearing support shall be provided for the bottom track at each bearing/stud location. Install full metal shims below bottom track at stud locations as needed, or set bottom track in high-strength grout.

C. Abutting or intersecting pieces or track shall be securely anchored to a common structural element or spliced together.

1. Splices or butt welds shall be used at all butt joints in the runner track.
2. Do not splice studs.

D. Studs shall sit squarely in the top and bottom runner track with firm abutment against track webs.

1. Studs shall be aligned or plumbed and securely fastened to the flanges of both top and bottom track.
2. Space studs 16 inches on center maximum unless otherwise noted on Drawings.

E. Framed wall openings shall include a header and multiple studs at each edge of opening as indicated on Drawings.

F. Diagonal bracing shall be installed at locations indicated for frame stability.

G. Install bridging as indicated on Drawings where studs are to be finished on one side only.

H. Form corners and intersections of partitions with three studs. Provide additional studs as indicated or required.

I. Joining of members shall be made with welding; wire tying of framing members shall not be permitted.

J. Welded connections shall be made by resistance spot fusion welding, fillet welding, or plug welding and shall be done in accordance with the latest recommended procedures and practices of the American Welding Society.

K. Do not cut or notch stud flanges or cut additional opening in stud web.

L. Field abrasions and welds shall be touched up with zinc rich primer.

M. Tolerance: Install members to provide surface plane with maximum variation of 1/4 inch in 10 feet in any direction.

3.04 INSTALLATION OF FIRE-RATED ASSEMBLIES

A. Install studs which are components of fire-rated wall assemblies as indicated.

3.05 BACKING IN STUD PARTITIONS

A. Securely weld or screw cut sections of unpunched stud to at least three stud or furring supports, leaving flat surface of backing stud web to receive attachment of object to be secured.

B. Verify that any predrilling of backing and attachment of spacers to prevent crushing of collateral material is done prior to application of collateral material.

C. If it is determined by the Architect that backing was not provided for any items as required, the Contractor shall remove the finish material and install backing. The Contractor shall patch and refinish surface to match adjacent area and finish.

3.06 FIELD QUALITY CONTROL

A. The Owner's Testing Agency will:

1. Provide continuous inspection of welding, including prior fit-up, welding equipment, weld quality, and welder certification in accordance with CBC Section 1701.5(5.1).
2. Provide continuous inspection during installation as required to establish conformity of Work requirements.

End of Section

This page intentionally left blank

Section 07 42 14

Metal Wall Panels

Part 1. General

1.01 Related Documents

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

1.02 Summary

A. This section includes pre-formed flat seam wall panel system complete with anchor clips, fasteners, flashing, and trim.

1. Related Sections:

a. Section 07 – Common Work Results for Thermal and Moisture Protection

B. Related Work Specified Elsewhere:

1. Division 05 Section – Structural Steel
3. Division 05 Section – Metal Framing
7. Division 07 Section – Architectural Sheet Metal Flashing and Trim
8. Division 07 Section – Gutters and Downspouts

1.03 References

A. American Iron and Steel Institute (AISI):

1. Specification for the Design of Cold-Formed Steel Structural Members.
2. American Society for Testing and Materials (ASTM): B.
3. ASTM A240 Specification for Heat Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels: C.
4. ASTM A792 Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
5. ASTM A875 Specification for Steel Sheet, Zinc-5% Aluminum Alloy-Coated by the Hot-Dip Process.
6. ASTM B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
7. ASTM B370 Specification for Copper and Sheet and Strip for Building Construction
8. ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
9. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Air Pressure Differences
10. ASTM E331 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference

B. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

1. Architectural Sheet Metal Manual

1.04 Submittals for Review

A. Shop Drawings: Show wall panels with flashings and accessories in elevations, sections and details. Include metal thickness and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations. Indicate relationships with adjacent and interfacing work. Indicate fastener types and spacing; and provide fastener pullout values. Shop drawings must be completed by the wall panel manufacturer's engineering department. Any and/or all changes recommended by the successful bidder must be approved by the manufacturer in writing prior to submittal.

B. Product Data: Include manufacturer's detailed material and system description, concealed anchor clips, sealant and closure installation instructions, and finish specifications. Indicate fastener types and spacing; and required fastener pullout values.

C. Samples: Provide full-size samples of the following materials and system components. Samples shall be of identical material type, thickness, panel width, and material grade/alloy as the system specified for this project.

1. Submit sample of panel section, at least 4" long x full panel width showing panel profile and also a sample of color selected.
2. Submit sample of foam closure strips to fit inside and outside specified panel profile.
3. Submit sample of panel fasteners.

D. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

E. Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the Design and Performance criteria in this specification. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.

1.05 Submittals for Information

A. Design and Test Reports: Provide the following certified test reports from an independent testing laboratory:

1. Independent laboratory testing report for system design load and seam integrity.
2. A letter from an officer of the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
3. Manufacturer's verifications that the panels are factory roll formed.

4. ASTM E283 Test results must clearly demonstrate compliance with the performance requirements specified in article 1.9 ASTM E331 Test Report.
5. ASTM E330 Test results must clearly demonstrate compliance with the performance requirements specified in article 1.9.
6. ASTM E331 Test results must clearly demonstrate compliance with the performance requirements specified in article 1.9.

B. Mill production reports certifying that the metal thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.

C. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7, Method 2 for Components and Cladding. In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria article.

D. Qualification Data for Wall System Installer: Refer to Quality Assurance Article below.

E. Certification of work progress inspection frequency: Refer to Quality Assurance Article below.

F. Pre-installation Conference Proceedings: Refer to Quality Assurance Article below

G. Test Reports: Submit third party validation of environmental claims, prepared by UL Environment, for all metal wall panels containing recycled content and/or bio based content.

1.06 Contract Closeout Submittals

A. General: Comply with Requirements of Division 01 Section Closeout Submittals.
B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
C. Wall Panel Maintenance Instructions: Provide a manual of manufacturer's recommendations for maintenance of installed systems.
D. Insurance Certification: Assist Owner in preparation and submittal of wall installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on wall panel system installation and associated work.
E. Demonstration and Training Schedule: Provide a schedule of proposed dates and times for instruction of Owner's personnel in the maintenance requirements for completed wall panel system installation work. Refer to Part 3 for additional requirements.

1.07 Quality Assurance

A. Installer Qualifications: Engage an Installer who has completed the Manufacturer's Approved Contractor course and is currently certified for the installation of the specified system.

B. If required, fabricator/installer shall submit work experience and evidence of adequate financial Responsibility. The Owner's representative reserves the right to inspect fabrication facilities in determining qualifications.

C. Source Limitations: Obtain all components of the wall panel system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the Manufacturer.

1. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
2. Manufacturer shall have direct authority and control over all fabrication of steel components as well as the raw materials used in their fabrication.

D. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001 approval.

E. Engage the Manufacturer's Field Representative to conduct required periodic inspections of work in progress as described herein and shall furnish written documentation of all such inspections.

F. Manufacturer shall provide the Owner project with a written statement that they will provide a site inspection every [1] days that confirms that the project is being constructed as specified, by an experienced, full time employee of the company.

G. Alternate Manufacturers: The following manufacturer criteria must be submitted. Alternate systems will not be considered for approval unless each of these items has been submitted for review at least 10 business days prior to bid opening.

1. Submit each item listed in article 1.4 (A through E) for evaluation of the proposed system.
2. Tests shall have been made for identical systems within the ranges of specified performance criteria.
3. Empirical calculations for wall performance shall only be acceptable for positive loads.
4. A list of a minimum of five (5) jobs where the proposed alternate material was used under similar conditions. The reference list shall include date of project, size of project, project address, and telephone number of architect/owner contact.
5. A financial statement demonstrating a minimum of a 3:1 ratio of assets to liabilities.
6. A written statement from the manufacturer stating that they will provide the building owner with a daily site inspection for a minimum of one (1) hour per day by an experienced, full time employee of the company.
7. A written statement from the manufacturer stating that they will provide the engineer of record with a daily site inspection by an experienced full time employee of the company.
8. A written statement from a corporate officer of the manufacturing company stating that he or she has reviewed the specifications and confirms that the proposed system meets or exceeds all performance

requirements listed as well as meets the panel size, gauge, weight, clip design, sealant design, uplift pressures and height of the vertical seam.
9. A copy of manufacturer's warranty.

H. Proof that the manufacturer has been in business for a minimum number of years equal to the warranty period required.

1.08 Pre-installation Conference

A. Convene a pre-installation conference approximately two (2) weeks before scheduled commencement of system installation and associated work.
B. Require attendance of installer of each component of associated work which must precede or follow wall panel work (including mechanical or electrical work if any), Architect, Owner, system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, testing agencies and governing authorities.
C. Objectives of conference to include:

1. Review foreseeable methods and procedures related to work, including set up and mobilization areas for stored material and work area.
2. Tour representative areas of building, inspect and discuss condition of substrates, penetrations and other preparatory work performed by others.
3. Review structural loading limitations of wall framing and inspect for unacceptable variations in planarity.
4. Review system requirements (drawings, specifications and other contract documents).
5. Review required submittals both completed and yet to be completed.
6. Review and finalize construction schedule related to work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
7. Review required inspection, testing, certifying and material usage accounting procedures.
8. Review weather and forecasted weather conditions and procedures for unfavorable conditions, including possibility of temporary wall protection (if not mandatory requirement).
9. Record discussion of conference including decisions and agreements (or disagreements) reached. Furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
10. Review notification procedures for weather or non-working days.

D. The Owner's Representative will be designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.

E. The intent of the conference is to resolve issues affecting the installation and performance of wall panel work. Do not proceed with work until such issues are resolved the satisfaction of the Owner and Engineer of Record. This shall not be construed as interference with the progress of Work on the part of the Owner or Engineer of Record.

1.09 Delivery, Storage, and Handling

A. Manufacturer's Responsibilities:

1. All panels shall be shipped from the manufacturer with a strippable film or similar packaging material separating the individual panels to minimize flexing, stressing, scratching or otherwise damaging the material during transit to the job.
2. Fully cover steel with tarpaulins or similar protective cover during transit to prevent dirt and debris from coming in contact with the finished goods.

B. Installer's Responsibilities:

1. Stack pre-finished materials to prevent twisting, bending, abrasion and denting and elevate one end to facilitate moisture run-off.
2. Unload wall panels using a boom or crane, supporting the panels in at least two locations during lifting, and never lift more than three panels at a time.
3. Protect moisture-sensitive materials and water-based from the weather.
4. Inspect materials upon delivery. Reject and remove physically damaged or marred material from project site.

1.10 PROJECT CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage and protection requirements for wall panel system.

1. Protection:

a. Protect completed work from subsequent construction operations. Comply with Manufacturer's recommendations.

b. Do not encumber the site with stored materials or equipment.

c. Do not support wall-mounted equipment directly on the wall panel system.

C. Ascertain that work of other trades which penetrates the wall or is to be made watertight by the wall is in place an approved prior to installation.

1.11 Design and Performance Criteria

A. Thermal Expansion and Contraction:

1. Completed metal wall panel and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.
2. The design temperature differential shall be not less than <insert design temperature differential [200] °F.
3. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.

B. Uniform wind load capacity:

1. Installed wall panel system shall withstand negative design wind loading pressures complying with the following criteria. Anchor clips shall be installed exactly as specified in article 3.

a. Design Code: ASCE 7-10, Method 2 for Components and Cladding.

b. Safety Factor: 1.65 after any load reduction or material stress increase.

c. Category III Building with an Importance Factor of 1.00.

d. Wind Speed: 120 mph

e. Ultimate Pullout Value: 407 pounds per each of the two fasteners holding the panel anchor to the wall substrate or framing system.

f. Exposure Category: B

g. Wall Height: 15 feet.

h. Minimum Building Width:26.24 feet.

Wall Area Design Wind Pressure: 21.95 psi

Zone 4 – Field of wall 15.4 psf.

Zone 5 – Wall Corner 19.0 psf.

2. Capacity shall be determined using uniform static air pressure method in accordance with ASTM E330. Allowable safe working loads shall be determined by dividing the ultimate test load by the safety factor specified above.

A. ASTM E283: Static pressure air infiltration (doors, windows, curtain walls):

1. Pressure Leakage Rate

a. 1.57 PSF 0.0033 cfm/sq. ft.

b. 6.24 PSF 0.0056 cfm/sq. ft.

c. 12.0 PSF 0.062 cfm/sq. ft.

d. 15.0 PSF 0.064 cfm/sq. ft

e. 20.0 PSF 0.074 cfm/sq. ft.

B. ASTM E330: Uniform static load test for structural performance for 1 ½" panel profile:

1. Test results must provide an allowable pressure of no less than:

a. 42 lbs/sqft. For 3'-0" spans

b. 52 lbs/sqft for 1'-0" span

C. ASTM E331: Static pressure water infiltration (doors, windows, curtain walls):

1. Pressure Result:

a. 5 Gal./Hr. per S.F. and Static No Leakage

b. Pressure of 20.0 Psf. For 15 minutes.

1.12 Warranties

A. Manufacturer shall execute a single warranty covering of the following criteria. Multiple-source warranties are not acceptable.

1. Manufacturer's ten (10) year watertight warranty.
2. Manufacturer's standard twenty (20) year finish warranty covering checking, crazing, peeling, chalking, fading, or adhesion.
3. Installer's two (2) year warranty covering wall panel system installation.
4. Warranties shall commence on date of Substantial Completion.
5. Provide a single warranty by a single approved manufacturer for roof areas, wall areas, and transitions between the two systems, if applicable.

1.13 Manufacturer's Inspections

A. When the project is in progress, the wall panel system manufacturer will inspect the work not less than [insert number] days per week. In addition, the manufacturer will:

1. Keep the Architect or Owner informed as to the progress and quality of the work as observed.
2. Provide periodic job site inspections a minimum of [3] day per week.
3. Report to the Architect in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
4. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

Part 2 – Products

2.01 PRODUCTS, GENERAL

A. Refer to the General Conditions "Common Product Requirements."

B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified here in shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.

1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.02 Acceptable Manufacturers

A. The design is based upon R-MER Span wall panel systems engineered and manufactured by:

1. The Garland Company
   3800 East 91st Street
   Cleveland, Ohio 44105
   Telephone: (800) 762-8225
   Website: www.garlandco.com

   Representative: Adam Faville (afaville@garlandind.com)

2. Or approved equal.

B. Site Formed Panels: Bidder will not be allowed to supply panels formed at the job-site on portable roll formers; metal panels must be factory pre-manufactured and engineered for this project.

2.03 Metal Wall Panel System

A. General

1. The products, quality, and performance criteria specified shall be regarded as the minimum standard of quality required for the project.
2. Basis of Design: R-MER Span Wall System manufactured by The Garland Company, Cleveland, OH.

B. Materials

1. Panel material: [22 ga.], Zinc-Coated (Galvanized) Steel Sheet, as per ASTM A653: G90 (Z275) coating designation; structural quality, grade 40 ksi (275 MPa).
2. Flashing and flat stock material: Fabricate in profiles indicated on drawings of same material, thickness, and finish as wall panel system, unless indicated otherwise.

C. Finish on surfaces:

1. Exposed surfaces for coated panels:

   a. Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer's approved applicator.

b. Coating system shall provide nominal 1.0 mil dry film thickness, consisting of primer and color coat.

c. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.

2. Unexposed surfaces for coated panels shall be baked-on polyester coating with .20 - .30 dry film thickness (TDF).

3. Exposed and unexposed surfaces for uncoated panels shall be as shipped from the mill.

D. Characteristics:

1. Fabrication: Panels shall be factory roll-formed from the specified metal. Field rolled panels will not be allowed. 1.
2. Configuration: Interlocking flush/flat seams incorporating concealed anchor clips. Through fastened or exposed fastener systems are not acceptable.
3. Panel seam legs shall be one and one half (1 ½) inch nominal concealed depth behind the panel face. Seam shall allow for expansion and contraction of panels due to thermal changes. 3. Anchor clips: Clips shall be 22 gauge galvalume steel designed to allow thermal movement of the panel in each direction along the longitudinal dimension.
4. Panel Width (Seam Spacing): [12”] nominal.
5. Panel lengths: Full length without joints to the extent as is practical.
6. Profile of panel face shall have mesa’s every two (2) on center continuous throughout panel which are a minimum of one and one half (1 ½) inches wide. These will absorb thermal stresses, reduce oil canning, and provide aesthetic appeal.
   Profile of panel face shall have a single Vee-groove reveal located three (3) inches in from each panel seam. These will absorb thermal stresses, reduce oil canning, and provide aesthetic appeal.
   Profile of panel face shall have a double Vee-groove reveal located in the center of each panel face. These will absorb thermal stresses, reduce oil canning, and provide aesthetic appeal.
   Profile of the panel face shall be flat and free from any mechanical finishes.
   Profile of the panel face shall be flat and free from any mechanical finishes. A nominal three fourths (3/4) inch thick expanded polystyrene insulation board shall be adhered to the inner cavity of the panel.

E. Accessories:

1. Fasteners:

   a. Concealed fasteners: Corrosion resistant steel screws, #10 x 1” long, pancake head, Phillips drive. Use self-drilling, self-tapping for metal substrate or A-point for plywood substrate.

b. Exposed fasteners: Series 410 stainless steel screws or one eighth (1/8) inch diameter stainless steel waterproof rivets. All exposed fasteners shall be factory painted o match the color of the wall panels.

2. Provide all miscellaneous accessories for complete installation.

2.04 ACCESSORY PRODUCTS

A. Sealant:

1. Acceptable product:

a. Concealed Application: Non-curing butyl sealant or equal.

b. Exposed Application: Garland SS sealant or equal.

2. Colors: As selected by architect from sealant manufacturer's standard selection.

B. Wall Substrate:

1. Install 15/32" (minimum) thickness exterior grade plywood sheathing along wall area.
2. Install ¾" high x 24 gauge (minimum) galvanized steel during hat sections to wall structural substrate. Hat sections shall be installed perpendicular to panel seams, and shall be spaced thirty (30) inches on center (maximum) to accommodate the panel fastener spacing given in article 3.2 C.
3. Install 16 gauge galvanized steel zee furring sections to the wall structural substrate. Zee sections shall be installed perpendicular to panel seams, and shall be spaced thirty (30) inches on center (maximum) to accommodate to the panel anchor clip spacing given in article 3.2 C.

2.05 FABRICATION

A. Shop fabricate metal panels and flashing components to the maximum extent possible, forming metal work with clear, sharp, straight, and uniform bends and rises. Hem exposed edges of flashings.

B. Form flashing components from full single width sheet in minimum ten (10'-0") feet sections. Provide shop fabricated, mitered corners, joined using closed end pop rivets and joint sealant.

C. Fabricate panels and related sheet metal work in accordance with approved shop drawings and applicable standards.

Part 3 – Execution

3.01 EXECUTION, GENERAL

A. Comply with requirements of the General Conditions "Common Execution Requirements."

3.02 PREPARATION

A. Inspection: Examine the alignment and placement of the building structure and substrate. Correct any objectionable warp, waves or buckles in the substrate before proceeding with installation of the pre-formed metal panels.

B. Pre-installation conference: Prior to beginning metal wall panel work, convene a pre-installation conference as specified in Part 1 of this Specification.

C. It is understood that the ongoing operations of the Owner area of a critical nature as to leak sensitivity. Do not work on more wall area than can be restored completely watertight in one day.

3.03 INSTALLATION, GENERAL

A. Install wall system when the atmospheric dry bulb temperature is minimum forty (40) degrees Fahrenheit and rising.

B. Install all components of the wall system in exact accordance with the manufacturer's standard published procedures as applicable to these project conditions and substrates.

3.04 WALL PANEL INSTALLATION

A. Comply with all details and install wall panel materials and flashings in accordance with approved Manufacturer's [details<or>shop drawings] and manufacturer's product data within specified erection tolerances.

B. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

C. Limit exposed fasteners to extent indicated on [details<or>shop drawings].

D. Seal laps and joints in accordance with system manufacturer's product data.

E. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

F. Form joints in linear sheet metal to allow for one fourth (1/4) inch minimum expansion at twenty (20'-0") feet on center maximum and eight (8'-0") feet from corners.

G. At joints in linear sheet metal items, set sheet metal items in two (2) one fourth (1/4) inch beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

3.05 CLEANING

A. Clean installed work in accordance with the manufacturer's instructions.

B. Replace damaged work than cannot be restored by normal cleaning methods.

3.06 Construction Waste Management

A. Remove and properly dispose of waste products generated during construction. Comply with requirements of authorities having jurisdiction.

3.07 Final Inspection

A. At completion of installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, system manufacturer's representative, and other representatives directly concerned with performance of system.

B. Inspect work and flashing of penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Notify the Architect upon completion of corrections.

E. Following the final inspection, provide written notice of acceptance of the installation from the system manufacturer.

F. Immediately correct leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

3.08 Demonstration and Training

A. At a time and date agreed to by the Owner, instruct the Owner's facility manager, or other representative designated by the Owner, on the following procedures:

1. Troubleshooting procedures
2. Notification procedures for reporting leaks or other problems
3. Maintenance
4. The Owner's obligations for maintaining the warranty in effect and force
5. The Manufacturer's obligations for maintaining the warranty in effect and force

End of Section

This page intentionally left blank

Section 07 62 00

Architectural Sheet Metal, Flashing and Trim

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

Item	Description
General	Furnish all labor, materials, and equipment necessary to install sheet metal flashing work shown on the drawings and specified herein, Included, but not limited to:
Special Coordination	• Roof flashings including copings, cleats, cornice cap and flashing, reglets, counter flashings, curb cap flashings, saddle flashings, roof penetration flashings, air and gas vent roof terminations and exhaust hoods. • Conductor heads, rainwater leaders, downspouts, straps, gutters, diverters, hangers and splash blocks or pans. • Wall opening flashings, window head flashing, door head flashing, window sill covers at metal siding, siding termination flashings, pan flashings, saddle flashings. • Rain caps for exhaust vents where termination is made through wall. • Sheet metal flashing, counter flashing and pan flashing indicated in the drawings. • Cleaning, repair and re using existing components listed in this Section, which are undamaged or can be restored to a new condition, for which the Contractor will provide warranty. • All other miscellaneous exterior galvanized sheet metal 24 gauge and lighters as shown in the Drawings, and also not specifically shown but necessary to complete the work.

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

1.03 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

Item	Description
Catalog Cuts	n/a
Product Data	n/a
Samples	n/a
Shop Drawings	Describe material properties, profile, jointing pattern, jointing details, fastening methods, and installation details.
Schedule	Include Schedule entry on Gantt Chart for Installation

1.04 References/Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

References	The work shall comply with the latest edition of the manual "Suggested Specifications for Architectural Sheet Metal Work, and "Architectural Sheet Metal Manual" published by the Sheet Metal and Air-Conditioning Contractors' National Association (SMACNA) NRCA (National Roofing Contractors Association) - Roofing Manual.

1.05 Quality Assurance

A. Provide the following per the General Conditions.

Item	Description
Supervision	Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site.
Qualifications of Workers	Applicator: Company specializing in sheet metal flashing work with five years minimum experience. The Contractor shall guarantee against any and all defects in material or workmanship of those items furnished and installed, repaired or sheet metal remaining in use as part of this Work for a period of 3 years after the recording of Notice of Completion. Failure types include but are not be limited: failure to stay in place, lifting fasteners, buckling, break in seams, corrosion, loss of paint adhesion.
Product Acceptance	General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.
Substrate Acceptance	General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.
Structural calculations	Provide structural calculations as required to meet

California Building Code. Calculations shall be by a Structural Engineer licensed in the state of California. Fabrication drawings shall be stamped by a California Licensed Structural Engineer.

1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Item	Description
Supervision	Per the General Conditions

1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

Item	Description
Observation	Per the General Conditions

1.08 Closeout

A. Provide the following Close Out materials in accordance with the General Conditions.

Item	Description
Product Manuals	Maintenance and Operations instructions / manuals provided by all product / material manufacturers.
System Manuals	Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.
Surplus Materials	n/a
Training	n/a

1.09 Warranty

Provide written warranty in accordance with the General Conditions

Item	Description
Warranty Form	Per the General Conditions.
Warranty Period	1 year
Warranty Start	Date of Substantial Completion

Part 2. Products

2.01 Materials

A. Sheet metal trims are used in various locations to provide closure between structural steel framing system and related wall assemblies. System is intended to provide weather tight closure to prevent the infiltration of outside air and moisture.

B. System is intended to be architectural true and straight and shall occur in straight parallel and perpendicular lines as appropriate to particular details.

C. Conform to SMACNA Architectural Sheet Metal Manual for cleats, attachments, joints and other standard configurations not shown.

2.02 Accessories

A. Plastic Cement: ASTM D2822 made with Group II asphalt.

B. Bituminous Coating Compound: FS TT-C-494, cold-applied mastic compounded for 15-mil dry-film coating thickness.

C. Sealant: Polyurethane as specified in Section 07920. For metal to metal contact, Geocel 2000 is acceptable.

D. Underlayment: ASTM D266; no. 15 asphalt saturated roofing felt, unless heavier weight is noted on the Drawings.

E. Nails: Hot-dipped galvanized nails shall be long enough to provide a minimum penetration of 3/4 inch into wood, 1 inch into concrete surfaces.

F. Screens: Debris screen shall be 1/4" mesh hardware cloth, 23 gauge wire, galvanized.

G. Solder: ASTM 332; alloy grade 50A (50% tin, 50% lead).

H. Soldering Flux: Rosin or muriatic acid killed with zinc. Neutralize flux after soldering.

I. Miscellaneous Steel: ASTM A36, galvanized; shapes and sizes shown.

J. Zinc-Rich Paint: MIL-P-21035; weight not less than 21 lbs. per gallon and containing not less than 95% pure zinc.

K. Etching Primer, in preparation for painting by others: Flashing surfaces to be finished painted include coping, conductor heads, head flashing, downspouts, and other flashing visible below the roof level.

D.J. Simpson Galva-Wipe, Ospho, or other pickling solution.

2.03 Fasteners and Anchors

A. Downspout Straps and Anchorage Devices: Hangers shall be fabricated from minimum 1/16" thick x 2 inch wide galvanized steel flat stock. Attach straps with min. 1/4 inch id. stainless steel or hot dipped galvanized bolts at masonry, wedge type or in shields. Similar lag bolt anchors for installation to wood studs. See drawings for additional requirements

B. Fasteners: Non corrosive, compatible with base metal. Screws and washers shall be plated with zinc or cadmium. Where fasteners are exposed, use pan head or washer head screws with neoprene washers, coat heads with sealant.

2.04 Shop Fabrication and Assembly

A. Shop fabrications: All flashing terminations to have saddle flashings, with minimum 6 inch legs in any direction. Saddle flashings, pan flashings to be lapped, spot welded and all joints soldered and sealed to form 'one piece' assemblies.

B. Form sections true to shape, accurate in size, square, and free from distortion or defects.

C. Fabricate cleats and starter strips of same material as sheet or next heavier gauge, minimum 2" wide, interlockable with sheet.

D. Form pieces in longest practical lengths.

E. Form flare in metal edge for receipt of sealant where detailed.

F. Form material with flat lock seam.

G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

H. Fabricate flashings to allow toe to extend 6 inches minimum over/under roofing underlayment, wall moisture barrier. Return and break edges.

I. Form scuppers, splash pans, custom pieces and downspouts of profiles and sizes indicated on Drawings and to properly collect and remove water. Fabricate complete with required connection pieces.

J. Work exposed to moisture or weather must be thoroughly watertight with provision for free expansion without leaks.

K. Width of Seams:

1. Flat-Lock Seam: 1/2 inch wide.
2. Lapped Seam (Soldered, Subject to Stress): 1 inch wide.
3. Lapped Seam (Soldered, Not Subject to Stress): 1/2 inch wide.
4. Lapped Seam (Expansion Joint, Filled with Sealant Tape or White Lead): 4 inches wide.

L. Expansion and Contraction:

1. Provide for thermal expansion and contraction and building movement in completed work without overstressing materials, breaking connections, or producing wrinkles and distortion in finished surfaces.
2. Where subject to thermal expansion and contraction, attach members with clips to permit movement without damage. Provide slotted or oversize holes with neoprene washers to accommodate thermal expansion and contraction of sheet metal. Install coping with cleats one side, and slotted holes 24 " o.c. to allow for expansion.
3. Make lock-seam work flat and true to line, and sweat full of solder, except where installed to permit expansion and contraction. Lap flat lock seams, and lap seams where soldered according to pitch, but in no case less than 4 inches. Make seams in direction of water flow. Do not buck water.

Part 3. Execution

3.01 General

A. Sheet metal Work exposed to the weather shall be installed watertight with suitable provision for free expansion and contraction without causing leaks. Seams shall overlap in the direction of the water flow. Flat seams shall be at least 1/2-inch wide, single locked, and sweated with solder or single locked and malleted flat. Loose-lock seams shall be single locked and without solder with bottom hook 1-1/4 inches and top hook 1 inch wide, unless otherwise shown or specified. Lap seams where permitted shall be min 2" wide, bedded in sealant, over backing plate.

B. Where flashing is to be rigidly secured, screw or nail flanges at 4" o.c. minimum, unless noted.

C. Lightly sand and prime surfaces which are to be installed with roofing materials. Primer as recommended by roofing cement manufacturer.

D. Providing flashing and counter flashing as shown on the Drawings and necessary to insure watertight conditions. Special care shall be taken to provide flashing in areas where different materials meet.

E. Dissimilar Materials Isolation: To prevent corrosion and galvanize corrosion (electrolysis), isolate galvanized steel metal flashing with bituminous coating when in contact with copper, redwood or red cedar. Isolate lead flashing or aluminum from uncured concrete and mortar. Apply bituminous paint between dissimilar metal materials.

3.02 Inspection

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located. Verify all blocking and backing necessary for securing flashing is in place.

B. Verify membrane termination and base flashings are in place, sealed and secure.

C. Beginning of installation means acceptance of existing conditions and substrates.

3.03 Coordination

A. Sheet metal trims may require partial installation in conjunction with the work of other trades. Coordinate all such work to ensure that cleats and other attachment devices are installed in the proper sequence.

B. Examine drawings and anticipate all installation sequence issues to insure that flashings are installed to produce positive drainage and weather tight conditions.

C. Provide fabricated flashings prior to installation of building systems requiring flashing below or behind.

D. Provide all cricket and roof daring components at clerestory windows prior to installation of windows.

3.04 Preparation

A. Field measure site conditions prior to fabricating work.

B. Install blocking, starter and edge strips, and cleats before starting installation.

C. Prepare flashing to have paint finish with etching primer. Rinse thoroughly.

3.05 Installation

A. Strike a true and level line along entire substrate prior to installation. Layout entire assembly to determine appropriate start and finish points.

B. Finished work shall be visibly straight and true, regardless of deflection in supporting substrate.

C. Install all parts to insure positive drainage and weather tight conditions.

D. Conform to drawing details included in SMACNA and NRCA manuals. Where a conflict between reference standards, drawings and specifications occur, the more strict requirement as determined by the Architect shall govern.

E. Downspouts: Join lengths with formed seams sealed watertight.

F. Fit flashings tight in place, unless providing for expansion. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Slope horizontal surfaces to shed water.

G. Window Sills: At window openings within metal siding, cover sill with GSM to match existing, lay in with metal siding.

H. Coping: Replace existing wood blocking, blocking anchors where damaged or corroded. Provide new blocking above first watch. Wrap parapet top with self adhering bitumen membrane moisture barrier. Install new coping with cleats, pan head screws at 24" o.c. Install in 10 FT lengths with hemmed edges, joint covers, one piece corners, saddle flashings at all changes in direction.

I. Set splash pans where rainwater leaders or downspouts spill rainwater collected from roofs onto lower roofs or grades.

J. Where pan, saddle or termination flashing abuts wood framed wall, ensure wall moisture barrier laps over flange of sheet metal 4 inches minimum. Although not specifically detailed, provide additional asphalt felt paper, self adhering bituminous membrane where needed at wall to flashing joints to provide proper lap in all materials.

K. Door Pan Flashing, Door and Window Head Flashing: Refer to Drawings for size, configuration and fabrication requirements. Provide and install flashings at all exterior openings as indicated on the Drawings. Extend ends of head flashings at doors and windows 1/2" past door or window.

End of Section

This page intentionally left blank

Section 07 63 50

Gutters and Downspouts

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

Item	Description
General	Gutters, downspouts, splash pans, scuppers and all sheet metal components related to roof drainage.
Special Coordination	• All accessories, cleats, supports and other appurtenances required to install same • Rain water leaders connecting to hard pipe downspouts.

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

Section	Title
07 62 00	• Architectural Sheet Metal and Trim
09 91 23	• Painting - New Construction

1.03 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

Item	Description
Catalog Cuts	n/a
Product Data	n/a
Samples	n/a
Shop Drawings	n/a
Schedule	Include Schedule entry on Gantt Chart for Installation

1.04 References/Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining “Industry Standards” and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

References	Perform Work in accordance with the following: • NRCA (National Roofing Contractors Association) Ä Roofing Manual. • SMACNA Architectural Sheet Metal Manual.

1.05 Quality Assurance

A. Provide the following per the General Conditions

Item	Description
Supervision	Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site.
Qualifications of Workers	Conform to SMACNA Architectural Sheet Metal Manual for sizing gutter and downspout component for rainfall intensity determined by a storm occurrence of one in 10 years. Sub-contractor to have minimum of ten (10) years of experience installing gutters.
Product Acceptance	General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.
Substrate Acceptance	General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.

1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Item	Description
Supervision	Per Division 1, System performance to physically protect membrane roofing, base flashings from damage that would permit water leakage to building interior.
Mock Ups	n/a

1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

Item	Description
Observation	Per the General Conditions.

1.08 Closeout

A. Provide the following Close Out materials in accordance with the General Conditions.

Item	Description
Product Manuals	Maintenance and Operations instructions / manuals provided by all product / material manufacturers.
System Manuals	Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.
Surplus Materials	n/a

Training	n/a

1.09 Warranty

Provide written warranty in accordance with Division 1

Item	Description
Warranty Form	Per the General Conditions
Warranty Period	1 year
Warranty Start	Date of Substantial Completion

Part 2. Products

2.01 Sheet Materials

A. Galvanized Steel: ASTM A525, Minimum 24 gage \ core steel or heavier gage as specified on drawings or in NRCA and SMACNA.

2.02 Accessories

A. Gutter and Downspout Anchorage Devices: per details

B. Gutter Supports: per details

C. Downspout Supports: per details.

D. Underlayment: No. 15 asphalt-saturated roofing felt.

E. Protective Backing Paint: FS TT-C-494, bituminous.

F. Slip Sheet: Rosin sized building paper.

2.03 Components

A. Gutters: to match existing profile on existing Administration Building

B. Rainwater leaders: per existing Administration Building.

C. Downspouts: Round profile (to match existing Administration Building), Schedule 40 galvanized steel

2.04 SHOP FABRICATION AND ASSEMBLY

A. Form components true to shape, accurate in size, square, and free from distortion or defects. Form pieces in longest practical lengths.

B. Fabricate cleats and starter strips of same material as sheet.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

D. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges. Form material with standing seam.

E. Fabricate corners in one piece, seam for rigidity, seal with sealant.

F. Form sheet metal pans with upstand, and flanges. Fill pans watertight with plastic cement.

2.05 Finish

A. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

Part 3. Execution

3.01 Gutter Installation

A. Strike a true and level line along entire fascia for new gutter installation. Install brackets with new screws to match existing in size and length.

B. Finished gutter shall be visibly straight and true, regardless of deflection in supporting roof.

C. Gutter face shall be supported by straps at adequate intervals to insure straight and true appearance, no oil-canning and ability to resist bowing when full.

End of Section

Section 07 90 00

Joint Sealers

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, Apply to the work specified in this section.

B. Part 1, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section. Items noted here are those specifically related to the General Contractor'

C. All California Prevailing Wage Laws apply to the work of this section.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of all work of this Contract.

B. The required applications of sealants and caulking include, but are not necessarily limited to, the following general locations:

Item	Description
Sealants	• Provide and install all sealants required as part of this section or any other section of these specifications. Locations include, but are not limited to, items below: • Sealants at all exterior joints between dissimilar materials. • Fire stop sealant and "safe-ing" at new and existing penetrations through all rated assemblies, and at locations indicated in the Drawings • Flooring joints • Flashing reglets and retainers • Roof penetration Components • Any additional locations requiring sealant, air-tight installation, weather tight installation or joint closure for appearance purposes.

C. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

1.03 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

Item	Description
Catalog Cuts Product Data	• See below • Provide product data for each type of product and process specified in this section and incorporated into the work of other sections during fabrication, finishing, and installation. • Submit two copies of manufacturer's specifications,

	recommendations, and installation instructions for each type of sealant, caulking compound, and associated miscellaneous materials required. Include manufacturer's published date, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown. • Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability • Provide data for initial selection purposes in form of manufacturer's color charts, actual units or sections of units, products or assemblies
Samples	• Submit samples of texture finish • Provide samples showing full range of colors, textures, and patterns available for each type of material indicated.
Shop Drawings	• n/a
Schedule	• Provide schedule for job indicating the location and type of sealant proposed to be used for each condition • Include Schedule entry on Gantt Chart for Installation

1.04 Quality Assurance

A. The following procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Item	Description
Supervision	• Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site.
Qualifications of Workers	• General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. General Contractor shall require subcontractors to remove any unqualified workers from the project.
Product Acceptance	• General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation.
Substrate Acceptance	• General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any item.
Manufacturer	• Company specializing in manufacturing the products specified in this Section with minimum three years experience.
Applicator	• Company specializing in applying the work of this Section with minimum three years experience.

1.05 References

References

- ANSI/ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
- ASTM C920-76, Types - Urethane Sealants.
- SWI (Sealing and Waterproofers Institute) - Sealant and Caulking Guide Specification.

1.06 Sequencing and Scheduling

A. Coordinate the work of this Section with all Sections referencing this Section.

1.07 Warranty

Item	Description
Warranty Form	• Per the General Conditions
Warranty Period	• Provide three year warranty for sealants
Warranty Start	• Date of Substantial Completion

A. Warranty: Include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of material, adhesion or cohesion, or do not fully cure.

1.08 Job Conditions

A. Conditions of Other Work: Examine the joint surfaces, backing, and anchorage of units forming sealant rabbet and the conditions under which the sealant work is to be performed, and notify the Architect, in writing, of any conditions detrimental to the proper and timely completion of the work and performance of the sealants. Do not proceed with the sealant work until satisfactory conditions have been corrected.

B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for installation.

Part 2. Products

2.01 Acceptable Manufacturers

A. Sika

B. Mameco

C. Vulkem

D. Sonneborn

E. or approved equal (substitution under provisions of Division 1)

2.02 Materials

A. Polyurethane Sealant

FS TT-S-00230C, Type II - non-sag, Class A; color as selected by Architect, use on exterior window and door perimeter joints, flashing bedding joints, or other locations where sealant or caulking is shown on dwgs.

B. Seal between foundation and new sill plate

"SILL SEAL", as manufactured by Dow Chemical, Ethafoam 221, polyethylene foam sealant.

C. Between floor and new door thresholds:

"GEOCEL" GSL-2000, all acrylic - solvent based sealant.

D. Fire rated Sealant (Fire Caulk)

Seal around all new and existing plumbing, electrical and miscellaneous penetrations through party walls, corridor walls, occupancy walls, floors, roof and other fire rated assemblies; Dow Corning - Fire stop #2000, one part silicone elastomer.

E. Sanitary Sealant, at perimeter of toilet room fixtures

Dow Corning #786, mildew resistant silicone sealant, white color U.O.N.

F. Interior woodwork joints

At painted finishes, seal wood joints, trim to wall joints. DAP Formula 230.

G. Mastic

Bituminous plastic cement, Federal Specification SS-C153; DAP Blacktite or approved equal. Use for setting purposes only.

H. Sealant A

Used for sealing joints between metal and concrete, metal and metal, concrete and concrete, metal and wood, wood and concrete, and general use. One part acrylic, Tremco "Mono" or approved equal. Colors as selected by the Architect.

2.03 Accessories

A. Primer

Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner

Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing

ANSI/ASTM D1565; round, open cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.

Part 3. Execution

3.01 Inspection

A. Examine existing exterior sealants, and evaluate condition. Undamaged existing sealants which have good adhesion, cohesion, or elasticity can remain, but must be guaranteed by contractor as would be for new sealants.

B. Verify new sealant joint dimensions, substrate materials and conditions

C. Verify physical and environmental conditions are acceptable to receive work of this Section. Beginning of installation means acceptance of existing conditions.

3.02 Preparation

A. Clean, prepare, and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant. Utilize three rag wipe method to clean joints:

1. One rag to clean dust
2. One rag to wipe with cleaning solvent,
3. One rag (last) to wipe dry.

4. Mask adjacent areas as necessary

B. Use backing rod to form required joint depths. Verify that backer rods, joint shaping materials are compatible with sealant.

C. Examine joint dimensions and size materials to achieve required width/depth ratios to be in compliance with manufacturer's written instructions. Generally, size of sealant in moving joint needs to be minimum 1/4 inch minimum dimension, with width two times joint depth.

D. Use cleaners and sealant primers when recommended by the manufacturer.

3.03 Installation

A. Apply sealant in accordance with the manufacturer's instructions and under direct supervision of skilled representatives or agents of the manufacturer.

B. Apply sealants within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.

C. Tool all joints to obtain good adhesion, forming concave profile.

D. Finish Joints: Free of air pockets, foreign embedded matter, ridges and sags.

3.04 Joint Surface Preparation

A. Clean and prime all surfaces of bonding area to receive specified materials according to the written directions of the applicable manufacturer. Primer, if required, shall be the product recommended by the sealant manufacturer.

B. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture, and other substances which would interfere with bond of sealant or caulking compound.

C. For elastomeric sealants do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed, or treated with water repellent or other treatment or coating, unless a laboratory test for durability (adhesion), in compliance with Paragraph 4.3.9 of FS TT-S-0027, has successfully demonstrated that sealing bond is not impaired by the coating or treatment. If laboratory test has not been performed or show bond interference, remove coating or treatment from joint surfaces before installing sealant.

3.05 Installation

A. Install back-up material in joints to be sealed; back-up material shall be 50 percent wider than the joint so that, when installed, it shall be compressed to two-thirds of its original thickness.

B. Joints shall have a depth of not more than one-half their width but shall not be less than 1/4 inch deep.

C. Seal continuously all perimeters between frames and adjacent construction and elsewhere as indicated on the drawings.

D. Apply sealant compounds with a gun having proper size nozzle to fill all voids and joints solid and water tight, leaving a smooth uniform surface.

E. Remove excess compound and leave adjacent surfaces clean.

End of Section

This page intentionally left blank

Section 09 91 23

Painting – New and Existing Construction

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, apply to the work specified in this section.

B. Parts 1,2,3,4,5,6, Title 24 of the California Code of Regulations (California Building Code) is to be considered an integral part of this section.

C. All California Prevailing Wage Laws apply to the work of this section.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

Item	Description
General	• Provision and installation of all painted coatings regardless of location on project • All preparation, surface cleaning, sanding, filling, de-glossing and priming required and not specified in other sections

B. Related work may be described in other sections of this Project Manual. All sections of this project manual are related. Contractor shall coordinate the work of this section with all other sections.

1.03 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

Item	Description
Catalog Cuts	• n/a
Samples	• Submit samples for Architect's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the materials and application for each coat of each finish sample • On 12" x 12" hardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit each sample as requested until required sheen, color, and texture is achieved • Include samples of proposed **Tinted Primer Color**. Refer **PART 2 – Products** For Primer Color Requirements • Samples shall be created utilizing the same process that will be used in the field. If painting is to be sprayed, then samples shall be sprayed. If painting is to be brushed, then samples shall be brushed. If painting is to be rolled, then samples shall be rolled
Product Data	• Submit two copies of the manufacturer's MSDS and PDS sheets which will include paint-label analysis and application instructions for each material specified
Paint Schedule	• Submit a paint schedule that includes manufacturer and paint system for each type of surface and substrate to be

	painted. Do not begin work until this schedule is approved by the Architect in writing.
Shop Drawings	• n/a
Schedule	• Include Schedule entry and conclusion on Gantt Chart for Installation of all coatings for this project. • Provide a Schedule of the products to be used on each building component. Include Manufacturer, product, sheen, number of coats and proposed method for installation as well as the intended preparation to successfully install the coating systems.

1.04 References / Standards

A. The following References and Standards are incorporated into the requirements of this Section as they apply to products, assembly, manufacturing procedures and installation. References shall be utilized in determining "Industry Standards" and other acceptable manufacture and installation methods but shall not relieve the Contractor of any other responsibilities of the Contract. Where conflicts occur between multiple listed references, the Contractor shall assume that the more restrictive standard applies and shall seek determination from the Architect regarding applicable standard.

References	• In addition to compliance with all pertinent codes and regulations, meet or exceed "Standard Type 1", as defined by the Painting and Decorating Contractors of America in the "Modern Guide to Paint Specifications", latest edition • Meet or exceed requirements of SSPC for all steel surfaces • MPI – Master Painters Institute, Architectural Painting Specifications Manual http://www.specifypaint.us
Standard	• EPA Method 24 – Determination of Volatile Matter Content, water Content, Density, Volume Solids, and Weight Solids of surface coating. • ASTM E2129, Standard Practice for Data Collection for Sustainability Assessment of Building Products • ASTM D3960, Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings. • ASTM D5116, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products • ASTM D6670, Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.

1.05 Quality Assurance

A. Provide the following per the General Conditions

Item	**Description**
Supervision	• Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement and delivery of all materials and products manufactured or assembled off-site. • **Superintendent:** Contractor shall provide knowledgeable personnel – Superintendent or Foreman – familiar with the scope of the Project and capable of communicating the status of the Work on a daily basis to the Architect and at all Required Inspections.
Qualifications of Workers	• General Contractor shall ensure that all workers providing labor on this project are fully competent and experienced in the area of work being performed. All

	workers will have at least two years of training from the supplying contractor. Documentation will be required. • Use only qualified journeymen painters for the mixing and applications of paint on exposed surfaces; in the acceptance or rejection of installed painting, no allowance will be made for lack of skill. • General Contractor shall require subcontractors to remove any unqualified workers from the project.
Product Acceptance	• General Contractor (Superintendent) shall verify and accept all products delivered to site prior to installation. • Architect reserves the right to reject any material not installed per current industry standards or recommended installation instructions of the Manufacturer, or not installed per these Specifications.
Substrate Acceptance	• General Contractor (Superintendent) shall verify all substrates / conditions prior to allowing installation of any primer, finish system or patching/repair product. • Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Refer Part 3 – Execution for more detailed Contractor Inspection requirements. • Moisture levels of all surfaces will be tested and documented by the painting contractor and the General Contractor. Additionally, all exposed masonry surfaces will be tested for PH and documented. All PH levels tested will be below: 10 PH before any repair, priming or painting will begin. • All existing coatings will be tested and verified to be lead free before any work can begin.

1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Item	Description
Supervision	• Per the General Conditions
Testing	• n/a
Special Inspections	• n/a
Mock Ups	• Provide mock-up for each color and sheen selection on each building component on the project. Use the same primer, paint, number of coats, and installation method that will be used for the final installation • Coordinate exact location for mock up in field with the Architect • Designated surface shall be the standard of quality for related surfaces upon review and acceptance by Architect

1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

Item	Description
Observation	• Per the General Conditions.
Inspection	• n/a • n/a

Review by Architect	• Contractor shall notify Architect at the following milestones so that Architect may review the condition of the work. Failure to coordinate these reviews may result in later work being removed for corrections in the earlier work:
	  • After power washing, cleaning, de-glossing, and preparation of all surfaces to receive paint
	  • After completed application of prime coat
	  • After application of final coat
	  • After final post application site clean-up operations are completed
	  • Prior to release of final payment

1.08 Close Out

A. Provide the following Close Out materials in accordance with the General Conditions

Item	Description
Product Manuals	• Maintenance and Operations instructions / manuals provided by all product / material manufacturers.
System Manuals	• Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.
Surplus Materials	• Provide (5) gallons of each type and color of paint used on the project
Training	• n/a

1.09 Warranty

A. Provide written warranty in accordance with the General Conditions

Item	Description
Warranty Form	• Per the General Conditions • Sub Contractor and manufacturer to provide warranty against defects in materials or workmanship. Replacement or repair of such defects shall be repaired or replaced in a timely fashion at no additional cost to the Owner
Warranty Period	• 3 years
Warranty Start	• Date of Substantial Completion

1.10 Painting Scope

A. General

1. Painting and finishing of exposed items and surfaces throughout the Project, except as herein specified.
2. Study Drawings and Schedules and Specifications of other trades and include priming and preparation where no other is specified. Be responsible for total mil thickness of coating systems as specified herein, including others' shop coats
3. "Paint", as used herein, means all coating systems materials, including primers, emulsions, enamels, sealers and fillers, stains and other applied materials, whether used as prime, intermediate or finish coats.

4. Paint all exposed *paintable* surfaces, whether or not colors are designated in "schedules", except where the natural finish of the material is obviously intended to be exposed and not painted. (Obviously, do not paint window glass, masonry, fire equipment, etc.)
5. Paint all wood and steel fences and gates (Excludes steel chain link fences).
6. Paint all steel chipping containers identified on plans, including stenciled signage.

B. Colors:

1. Colors to be approved by Architect.
2. Unless otherwise noted, provide all materials from a single manufacturer.
3. The contractor shall allow for a range of colors and shall anticipate the possibility of a different color on each type of material included in the project. No limits shall be assumed regarding numbers of colors, including selection of deep tones, except that colors will not be changed within the bound of a given material.
4. Generally and unless otherwise specified herein or noted on Finish Schedules the quantity of colors and finishes shall be based on the following criteria:

   (a) Color selection will be based on (1) base color and up to (4) accent colors, which may be deep or bright colors.

C. Existing Construction: Renovated Finish

1. Where existing clear finishes occur on wood surfaces and are scheduled for “Renovated Finishes”, provide preparation, surface repair, stripping (where required) and new finishes
2. In some cases, existing finish may be adequate as base for new finish
3. All areas requiring renovated finish will be reviewed in the field with the Architect prior to execution. Areas deemed to be heavily damaged may be re-designated for painted finish at the discretion of the Architect

D. Floor Coatings

1. Refer to other sections of this Project Manual for floors to receive paint, sealer, or similar coatings.

E. Specific Items Included: The following is intended to clarify items requiring paint. This list does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of all work of this Contract. The general contractor shall make all new surfaces, existing surfaces and repaired surfaces “ready for paint.” Once the Painting contractor has applied primer or paint to a surface he/she has assumed complete responsibility for the “readiness” of that substrate.

Exterior Paint	• Custom Metal bumpers around piers. • Gutters and downspouts. • Structural Steel Framing • Concrete Bollards • New and Existing equipment which does not include a factory finish or which includes a damaged factory finish. • All areas damaged or otherwise affect by any aspect of the construction of this project, including temporary facilities and dirt / dust.

1.11 Painting / Renovation Not Included

A. The following categories of work are not included as part of the painter-applied finish work, or are included in other Sections of these Specifications, unless otherwise shown or specified. No finish on the following

Do Not Paint:

- Stainless steel and nonferrous metals when used for metal doors and windows, counters, hardware, electrical plates, lighting fixtures, etc.
- Galvanized surfaces identified per plans to remain unpainted.
- Soffit vent screens that are currently unpainted
- Electrical, mechanical, and plumbing equipment and ductwork, except noted electrical conduits, ceiling registers, grilles, and diffusers which shall be field painted over manufacturer's prime coat
- Acoustical surfaces
- Fire alarm equipment: Smoke detectors, heat detectors, strobes, horns. Including protective cages or enclosures around such equipment.
- Factory-finished surfaces, equipment, etc
- Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, and shafts
- Existing concrete or masonry surfaces not specifically indicated as to receive paint, including concrete columns and masonry walls. These surfaces are to be renovated per Project Manual Section 09 91 23.
- Operating Parts and Labels
- Where necessary to gain access or protect surfaces the painting contractor shall remove and replace at no extra cost removable items such as fittings, awnings, shutters, cover plates, doors and handles.
- Any surface where a coating will interfere with movement and fit such as threads and hinges
- Glass, porcelain, plastic, textiles and other materials not suitable to be painted
- Shop coated, powder coated and baked enamel surfaces
- Signage, these are to be cleaned and graffiti coated.

B. Do not paint any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, door closers, sensing devices, motor and fan shafts, unless otherwise indicated.

C. Do not paint over any code-required labels, such, as UL and, fire ratings, Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

D. All masking, tape, paper, and plastic adhered to these items shall be removed by the Painting Contractor upon completion of paining and after required drying time. Absolutely no tape residue will be left on any surface. No tape will remain on an exterior surface for more that (14) days.

Part 2. Products

2.01 Paint

A. Paint, surface treatments, and finishes are shown in the Finish Schedules, Elevations, or indicated in the Specifications of the Contract Documents. Paint colors will be selected from the manufacturer's mixed colors prior to installation.

1. All surfaces shall receive a paint finish, except the exclusions in 1.10 and 1.11. If no finish is particularly indicated, the finish shall be the minimum coating specified in the paint finish schedule of this Section, for the particular substrate involved. It is the responsibility of the Painting Contractor to verify the exact coating choice, color, and sheen, as it relates to each and every substrate before a coating or primer is applied to any surface.

B. All paints shall comply with Flame Spread limitations defined in 2016 CBC Table 803.9. Refer to Drawings for specific requirements based on usage.

C. Final acceptance of colors will be from brush-out samples applied *in situ*.

D. Proprietary names used to designate colors or materials are not intended to imply that products of the manufacturer's are required to the exclusion of equivalent products of other manufacturer's.

E. Bids are to be based on specified coatings as manufactured by Benjamin Moore & Co., except as otherwise specified.

F. Requests for changes or variations must be made in writing by the Contractor to the Architect detailing the reasons, extra cost or savings per hour of labor and/or per gallon of paint. It is the burden of the Painting Contractor to prove the equivalency of any intended substitution of primers or coatings four weeks before beginning the project.

G. Paint Coordination: Provide finish coats and primers that are compatible and manufactured by the same manufacturer, except as otherwise specified. Review other Sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coating systems for various substrates. Upon request from other trades, furnish information on characteristics of specified finish materials, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect, in writing, of any anticipated problems using specified coating systems with substrates primed by others.

H. **Primer:** All primers and undercoats are to be tinted to the approximate shade of the selected finish coat, but the tint shall be sufficiently different to allow easy determination of the boundaries between coats. Where the color schedule calls for the use of deep tones, it is the responsibility of the Painting Contractor to utilize the appropriate Deep Base Primers as Manufactured by Benjamin Moore & Co. (or equal) for use on the surface for which they are intended.

2.02 Surface Repair / Stabilization Materials

A. Hardener for wood that is damaged, slightly decayed, softened, or weathered:

1. Quick drying, Solvent-borne resin hardener, such as Minwax High Performance Wood Hardener, System 3 End Rot, Abatron Liquid Wood, or approved equal.

B. Filler for defects in wood.

1. 2-part Epoxy filler such as Minwax High Performance Wood Filler, System 3 Wood Putty, Abatron Wood Filler, or approved equal.

Filler defects for metal.

2. 2 component filler such as 3m Bondo or approved equal.

C. Metal Etch / rust converter for rusty surfaces:

1. Phosporic Acid metal etch and prep such as Jasco Prep n' Prime, Ospho Rust Treatment, or approved equal.

2.03 Material Quality

A. Provide premium quality grade of the various types of coatings as regularly manufactured by approved paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, premium-grade product will not be acceptable.

B. Provide undercoat paint (Primer) produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.04 Materials

A. Unless otherwise specified, the products indicated under "Painting" are products of "Benjamin Moore & Co.;" comparable-quality products of Dunn-Edwards, ICI, Kelly-Moore, Pratt & Lambert or approved equivalent will be acceptable. Proof of equivalence is required in writing by the Painting Contractor.

B. Colors used shall be selected for their permanence and non-fading qualities. In addition, colors that are used over concrete and plaster shall not be applied if the concrete or plaster surface has a Ph rating higher than 13.

C. All paint and coatings must be delivered to the job site in the manufacturer's original and unopened containers, plainly marked with the proper designation of the product, as well as the name of the manufacturer. All coating materials at the job site shall be subject to inspection by the Architect.

D. The contractor shall retain sufficient quantities of paint of the same batch until completion of the entire project to permit uniform touch-up. Normal minor damages to painted areas by other trades during the course of the construction project shall be touched-up by the Painting Contractor at no extra cost.

E. It is to be understood by the General Contractor and the Painting Contractor that all coatings must conform to all state and local regulations including VOC rules at the time of application.

Part 3. Execution

3.01 Contractor's Inspection

A. It is the General Contractor and Painting Contractors responsibility to examine the areas and conditions under which painting work is to be applied. Notify the Architect, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected and inspected by the Architect.

B. All surfaces to be painted must be free of dirt, rust, scale, grease, moisture, scuffed surfaces, glossy, or conditions otherwise detrimental to the formation of a durable paint film.

C. Any surface which has been primed or painting constitutes acceptance of the surfaces and the conditions within any particular area.

D. Surfaces not being painted shall be protected from drips, spatter, over-spray and other paint contamination by means of masking, drop sheets and protective covers.

3.02 Surface Preparation

A. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instruction and as herein specified for each particular substrate condition.

1. The Painting Contractor shall be wholly responsible for the quality of his work, and is not to commence any part of it until the surface is in proper condition.
2. If the Painting Contractor considers a surface unsuitable for proper finishing, he shall notify the Architect in writing. The Painting Contractor is not to apply any material until corrective measures have been taken, or the Architect has instructed them to proceed.
3. If the Painting Contractor has been instructed by the General Contractor to begin painting under conditions and circumstances he believes could result In poor performance and early failure of the coating, he shall immediately inform the Architect in writing and request from the Architect for a decision in writing.

B. General, Existing Construction:

1. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.
2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease or waxes prior to mechanical cleaning. Schedule the cleaning and painting so that containments from the cleaning process will not fall onto wet, or newly painted surfaces.
3. Refer to the manufacture’s Technical Data Sheet for specified product and comply with the requirements regarding application such as: mixing of the components, thinning, pot life, and application equipment such as: roller type and nap length, brush type, tip size and gun type, air and fluid pressure, hose length and hose I.D., etc.
4. Ensure that expectations of humidity, precipitation and temperature (substrate, ambient and material) during application and curing of paints are within the range permitted by the manufacturer.
5. When substrate temperatures are high, care must be taken while applying the paint to prevent formation of voids, pinholes, and bubbles due to the rapid evaporation of solvent.

C. Wood:

1. Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, solvent, and sandpaper, as required. Sand smooth all finished surfaces and remove dust. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac other approved sealer before application of the priming coat multiple thin coats of white shellac may be necessary to "seal" the knot from "bleeding". After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dried. Spot prime over all exposed fillers. Preapproval from the Architect in writing is required before any w**ood surfaces can be pressure washed All wood surfaces that are intended to be power washed will need to be identified and agreed upon in advance by the painting contractor, Architect and General Contractor.**
2. Repair of defects, decay, and stabilization of soft areas: On all wood not identified to be replaced, all imperfections, divots, soft and weathered wood, and minor damaged areas shall be repaired before painting. All end grain shall be treated with wood hardener prior to repair and painting. All "butt" joints will be caulked with a Urethane base caulking to ensure a flexible joint to allow for the lateral expansion and contraction of the joint. The repair areas shall blend seamlessly into the surrounding surface.
    a. Scrape and remove all loose material from the damaged area.
    b. Treat the area with wood hardener per manufacturer's instructions
    c. Fill with epoxy filler. Multiple coats may be required
    d. Sand smooth and blend into surrounding area. Inspect and apply additional filler if required.
    e. Spot prime over patched and repaired surfaces.
3. Fill all cracks, joints, seams with caulk and allow to cure (see caulking manufacturer recommendations as it pertains to "cure: times.
4. Multiple coats of paint that are in an advanced state of deterioration and prior applications of cement-based paints must be removed by scraping, sanding or by the use of mechanical grinder. These areas will be referenced by the Architect and General Contractor during the "walk through".
5. New Wood must be dry, free of grease, oil mildew, mortar and asphalt spatters and mill glaze. Rough surfaces are to be sanded smooth. Cracks are to be caulked ; door and window trim and joints are to be caulked after surfaces have been primed so as to create a "sandwich" effect between the caulking/putty and the primed substrate. Nail holes are not to be filled. Painting is not to be done during or immediately following foggy, rainy or frosty weather, nor when the temperature is expected to go below 50°F before the coating has dried. Avoid painting surfaces while they are exposed directly to the hot sun, and refrain from painting during windy or threatening weather. Pressure treated wood (PTW) must be tested prior to coating to determine proper penetration of coating. Surface must be sprinkled with water to determine absorption into substrate. If water drops remain on PTW surface, do not paint. If water penetrates immediately into the surface, prepare surface as you would any wood and then prime. Smooth planed clapboards or siding must be sanded thoroughly with 80 grit sandpaper to remove the "mill glaze" to allow proper penetration and adhesion of the paint coating. If mildew is evident, it must be removed by scrubbing with a commercial mildew wash formulated for this purpose. Caution: Follow manufacturer's directions; wear rubber gloves, work goggles and protective clothing.
    (a) All timber delivered to the job site shall be tested with a moisture meter. All wood testing at or below 18% moisture content shall be immediately primed.

(b) Prime edges, ends, face, undersides, and backsides of such wood surfaces. When transparent finish is required, use spar varnish for back priming.
(c) Timber surfaces to be embedded in plaster or masonry shall be fully primed prior to installation. All timber end grain is to receive one extra primer coat.
(d) Back prime all new exterior wood.
(e) If more than (14) days have expired since the time of original priming all surfaces to be top- coated shall be lightly sanded or re-primed before a finish coat can be applied.

6. Previously Painted Wood must have all blistered, peeling, scaling and deteriorating paint removed to a clean, sound substrate, by scraping, grinding, sanding and/or wire brushing. Spot prime where bare wood is exposed. Chalk must be thoroughly removed to a sound substrate by wire brushing, sanding or by power washing. Remove all loose or split caulking, putty or glazing
7. Previously stained exterior wood:

(a) After ensuring that wood is dry, free of grease, oil mildew, mortar and asphalt spatters and mill glaze, sand with 80 grit sand paper to achieve an adequate profile for complete primer adhesion.
(b) Prime with a stain blocking acrylic primer.

D. New Exterior Cement Plaster:

1. Surfaces are to be dry, free of greasy residue, mortar and asphalt spatters. Thoroughly brush with a stiff fiber brush to remove loose particles.
2. Remove form release agents with appropriate solvents.
3. Remove laitance deposits by hand or power wire brushing, or other appropriate means.
4. Allow poured concrete and precast concrete to cure for 60-90 days; block and stucco surfaces 30-60 days. Fill all structural cracks and crevices with the appropriate caulking/patching compound. If efflorescence is present, first dampen the surface with water, and then scrub the surface with a 10% solution of muriatic acid. Caution: Wear rubber boots and gloves, work goggles, and protective clothing. After treatment, thoroughly flush the surface with clean water to remove all acid and allow to dry thoroughly before painting. If mildew is evident, it must be removed by scrubbing with a commercial mildew wash formulated for this purpose. Caution: Follow manufacturer's directions; use rubber gloves, work goggles and wear protective clothing.

E. Previously painted Exterior Cement Plaster:

1. Remove all peeling, scaling and deteriorating paint and chalk to a sound substrate by hand scraping, use of mechanical grinders or high-pressure washing. Fill all structural cracks and crevices with the appropriate caulking/patching compound. If mildew is present, remove by scrubbing with a commercial mildewcide wash formulated for this purpose.
2. Caution: Follow manufacturer's directions; wear rubber gloves, work goggles, and wear protective clothing.

F. Ferrous Metals:

1. Thoroughly clean New steel surfaces to remove all grease in accordance with SSPC-SP1 "Solvent Cleaning"

2. Remove rust, mill scale, etc., in accordance with SSPC-SP2-63 “Hand Tool Cleaning” or SSPC-SP3-63 “Power Tool Cleaning”. Particular care is to be exercised to remove welding flux, slag and fume deposits as is possible by blast cleaning, washing with water, Phosphate rinsing, or power tool cleaning. Weld Spatters and burs must be removed. Primer coats should be applied immediately after the surface is dry and within the same day as the acid wash was applied so that rust does not reappear do to overnight moisture. Factory applied “shop coat” primers must be re-primed with a rust inhibitive 2 component epoxy primer before finish coats are applied.

G. Previously painted steel:

1. Thoroughly clean following SSPC-SP1-63 to remove all grease, oil and dirt.
2. All loose, peeling and scaling paint is to be removed by hand scraping or power tool cleaning. Rusted surfaces should be cleaned in accordance with SSPC-SP2_63“ Hand Tool Cleaning” or SSPC-SP3-63 “Power Tool Cleaning”.
3. Surfaces are to be thoroughly cleaned after sanding, scraping, hand and tool cleaning, etc. Dull all glossy surfaces by sanding.
4. Removal of multiple coats of paint that are in an advanced state of deterioration shall be accomplished by sandblasting or by the use of a mechanical grinder.

H. New galvanized metals:

1. Thoroughly clean to remove all grease, oil dirt and contaminants in accordance with SSPC-SP1 “Solvent Cleaning”.

I. Weathered previously painted galvanized metal:

1. Remove all peeling and scaling paint, rust and chalk by scraping, sanding and wire brushing.
2. After scraping, sanding, and wire brushing thoroughly clean the surface, re-prime exposed metal with a 95% zinc primer by Rustoleum or other pre-approved manufacturer, and finish as specified.

J. Doors and frames

a. Remove all paint if it will interfere with adhesion of the new coating system.

b. Fill all dents, holes, and other surface imperfections with epoxy filler.

c. Sand smooth all chipped areas and apply several coats of primer to build up the surface until smooth.

d. Finish coats of paint shall be sprayed or brushed. NOT ROLLED. Rolled-on paint or any paint applied otherwise with a rough or “stippled/orange peeled” final texture will be rejected.

e. Carefully paint doors which will touch adjoining surfaces when closed. To prevent blocking (fusing of uncured coating), the doors are not to be closed until the coating is cured enough as to not allow the door and jam to fuse together. Where excessive coating film thickness impacts the operation, previous paint and excess film thickness shall be removed by sanding, grinding or stripping and the item repainted.

3.03 Materials Preparation

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue. Store materials not in actual use out of the direct sun at all times.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film, and if necessary, strain the material before using.

3.04 Application

A. General:

1. See Operations and Sequence section below for the definition of a “Coat” of paint or finish.
2. Apply paint in accordance with the Manufacturer's directions paying particular attention to recommended square feet per gallon. Use applicators and techniques best suited for the type of material being applied and that will provide a smooth professional, brush mark free finished surface.
3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color, and appearance.
4. Paint surfaces behind moveable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only. **Re-set all moveable equipment or furnishings in their original location upon completion and inspection by Architect.**
5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
6. Paint the backside of access panels and removable or hinged covers to match the exposed surfaces in the coating specified for the substrate.
7. Finish exterior doors on tops, bottoms, and side edges the same as the exterior faces, unless otherwise indicated.
8. Sand lightly between each succeeding enamel or varnish coat and remove all sanding dust before work commences.
9. No spraying to be done without prior written approval of the Architect or Owner.

B. Minimum Coating Thickness

1. Provide a total dry-film thickness as recommended by manufacturer, but not less than 4.5 mils for the entire coating system of prime the finish coat for three-coat work.
2. Prime Coats: Apply a prime coat to material which is required to be painted, and which has not been prime-coated by others.
3. Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.
4. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
5. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections are not acceptable and shall be repaired and re-painted.
6. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Always apply the first two coats in gloss and the final coat in the referenced final finish sheen. Provide a finish free of laps, cloudiness, color, irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

(a) Provide finish for final coats, unless other- wise indicated.(Unnecessary)

3.05 Clear Finish Renovation

A. Repairs

1. Do not begin finish renovation until all repairs have been made. Repairs may include patching, insertion of new panels or wood parts and spot wood repair.

B. Preparation:

1. Do not accept substrates in which panels, trims or other materials are loose, bowed or otherwise not in full contact with substrate.
2. Fill all nail holes and small cracks with permanent hardening putty to match final finish. **Do NOT fill originally existing joints between panels.**
3. Sand after putty has hardened to remove all residues and produce a smooth finish.
4. Light sand all wood surfaces prior to application of first coat. Sanding shall knock down all previous stubble and residue from previous finishes.
5. Clean with tack cloth to remove sanding dust.
6. Fully clean area and ensure that dust will not become airborne from movement of or air infiltration.

C. Application

1. Apply gloss clear finish with high quality brush or spray. Stroke parallel to grain and pull stroke full length to avoid brush ends and runs.
2. After first coat is dry, and per manufacturer specification, light sand completed finish to knock down all stubble, dust and residue.
3. Apply second coat of clear gloss fully covering all areas applied by the first coat. Allow to dry and inspect.
4. All areas that remain rough, or stubbled or include dust shall be sanded, cleaned and final coated again with the referenced final sheen.

3.06 Operations and Sequence

A. All work is conditioned on adequate coating and finishing of all visible surfaces. Contractor shall provide all equipment necessary to meet this requirement. Equipment shall include lifts, scaffolding, ladders and any other appurtenances required to access surfaces.

B. Sequence of operations shall be determined by the requirements of the paint manufacturer and the finish requirements of this specification. Finish quality shall not be compromised by limitations resulting from equipment movement or setup.

C. Multiple setups may be required to apply different coatings or colors.

D. Multiple passes at each surface will be required to allow for multiple coatings and interim curing time. Contractor shall allow for as many passes as necessary to adequately coat each surface.

E. Contractor shall allow for multiple passes where the requirements of one finish component are different than those of another.

F. **Drying Time between coats:** Time between coats of primer and finish coats shall be dictated by the Required Inspections (refer to PART 1.) Each coat shall be allowed to dry completely before application of next coat.

1. **"Coat"** shall constitute a complete covering of any surface according to mfr. instructions for application of the particular coating specified and shall include manufacturer's specified drying time between coats. If mfr. specified curing time has not accrued prior to a subsequent coat, then the subsequent coat shall be considered a part of the previous coat and shall not constitute a required coat per these specifications. Multiple passes of any application device used for any coating shall not be considered multiple coats.

3.07 Cleanup and Protection

A. Cleanup:

1. During the progress of the work, remove from the Project daily all discarded paint materials, rubbish, cans, and rags.

   (a) Comply with local regulations for disposal of all paint materials including paint, stain, wood preservative finishes, solvents, and other related materials.
   (b) Recycle paint as available in jurisdiction. Separate materials by type. Where paint recycling is not available, materials shall be treated as hazardous waste and disposed in an appropriate manner.

2. Upon completion of painting work, clean all window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damaged finished surfaces. Cut and face all operating windows. All operable windows need to be shown to work correctly to the Architect before the project will be considered complete.

B. Protections: Protect the work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damages by cleaning, repairing, or replacing and repainting as directed by Architect.

1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.08 Product Delivery, Handling and Storage

A. Delivery all materials to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label.

3.09 Job Conditions

A. Do not apply water-base paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 50 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.

B. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog, or mist or when the relative humidity exceeds 85% or to damp or wet surfaces, unless permitted by the paint manufacturer's printed instructions. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying period.

Part 4. Coating Systems

4.01 Materials

A. For purposes of scheduling, the products indicated under Painting Systems are products of Benjamin Moore & Co.

B. Products used shall be selected for their permanence and non-fading qualities.

C. Colors and Finishes: Paint colors, surfaces treatments, and finishes are shown on the Drawings and indicated in the Schedules of the Contract Documents.

D. Use only vinyl acrylic or 100% acrylic paint; no oil (alkyd) based paints are allowed unless otherwise specified.

4.02 Paint Schedule

A. This schedule is comprehensive, there may be items listed here that are not within the scope of this project. Refer to Section 4.03 for items scheduled for Clear Finish.

Location	Components	Product
New Exterior Cement Plaster or stucco	First Coat:	Benjamin Moore #068 Super Spec Masonry Primer OR Benjamin Moore #066 Acrylic Masonry sealer
	Second Coat	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
	Third Coat:	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
Existing Exterior Cement & Gypsum Plaster (Previously Painted)	First Coat	Benjamin Moore #068 Super Spec Masonry Primer OR Benjamin Moore #066 Acrylic Masonry sealer
	Second Coat	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
	Third Coat	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
New Exterior Gypsum Plaster	First Coat	Benjamin Moore #066-01 Acrylic Masonry sealer
	Second Coat	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
	Third coat	Benjamin Moore #541 Ben 100% Acrylic Flat Finish
Existing Exterior Wood Trim (including doors and windows)	First Coat	Benjamin Moore #046 Fresh Start 100% Acrylic Exterior Primer Benjamin Moore #024 Fresh Start Alkyd Exterior Primer (required for window sash) Note: Refer section 08800 Glass and glazing for painting under new glazing compound on wood windows.
	Second Coat	Benjamin Moore #543 Ben Exterior Semi Gloss Finish
	Third Coat	Benjamin Moore #543 Ben Exterior Semi Gloss Finish
Existing Exterior Steel Fence, Railings, Gates, louvers	First Coat	*Over existing painted surfaces:* Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer *Over bare metal substrates:* Benjamin Moore /corotech V155 100% solid epoxy pre primer
	Second Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss

Location	Components	Product
Exposed Metal Ductwork and Registers	First Coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
	Third Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
New Hollow Metal Doors	First Coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
	Third Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
New Hollow Metal Frames	First Coat:	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
	Third Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
Existing Hollow Metal Doors (Previously Painted)	First Coat	Benjamin Moore #046 Fresh Start 100% Acrylic Exterior Primer
	Second Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
	Third Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
Existing Hollow Metal Frames (previously painted)	First Coat:	Benjamin Moore #046 Fresh Start 100% Acrylic Exterior Primer
	Second Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
	Third Coat	Finish with Benjamin Moore #M29 100% Acrylic Direct to Metal Semi Gloss Finish
New Metal Flashing, gutters, and rain water leaders	First Coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
Existing Painted Metal Flashing, gutters, and rain water leaders	First Coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
New Exposed Metallic Ductwork and Registers	First Coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss

Location	Components	Product
Existing steel structural posts and downspouts	First Coat	*Over existing painted surfaces:* Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer *For bare metal substrates:* Benjamin Moore /corotech V155 100% solid epoxy pre primer
	Second Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third Coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
Existing steel lockers	First coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
	Third coat	Finish with Benjamin Moore/Corotech V510 Aliphatic Acrylic Urethane Semi-Gloss
Existing Fire Hydrants, bollards, light poles, and vehicular gates	First coat	Prime with Benjamin Moore/Corotech V110 Acrylic Metal Primer
	Second coat	Finish with Benjamin Moore/Corotech V500 Aliphatic Urethane Gloss Enamel
	Third coat	Finish with Benjamin Moore/Corotech V500 Aliphatic Urethane Gloss Enamel

End of Section

Section 10 44 16

Fire Extinguishers - Installation only

Part 1. General

1.01 Related Documents

A. The Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, apply to the work specified in this section.

B. Parts 1,3,4,5,6, Title 24 of the California Code of Regulations is to be considered an integral part of this section. Items noted here are those specifically related to the General Contractor'

C. All California Prevailing Wage Laws apply to the work of this section. Refer to the City of Cupertino Labor Compliance Program and the specific "Labor Compliance Requirements" specification section included elsewhere in this Project Manual.

1.02 Work Included

A. The following is a general description of the work included in this section. This description does not limit the scope of work shown in the drawings nor does it relieve the Contractor of any responsibility for coordination of **ALL** work of this Contract.

Installation	Installation of Owner provided Fire Extinguishers

1.03 Related Work

A. Refer to the following sections for work specifically related to the work of this section. This information is provided for convenience and does not eliminate coordination requirements. All sections of this Project Manual and all other Contract Documents shall be considered related by the Contractor.

1.04 Submittals

A. Provide the following submittals per the requirements of the General Conditions.

1. None required

1.05 Quality Control

A. Provide the following per the General Conditions:

Supervision	• Full time supervision and observation by the Contractor of all on-site Construction Activities including ordering, procurement

	and delivery of all materials and products manufactured or assembled off-site.
Substrate Acceptance	• n/a

1.06 Quality Control by Contractor

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract Documents.

Supervision	• Per the General Conditions.

1.07 Quality Control by Owner

A. The following specific procedures shall be required to demonstrate adequate levels of quality provided for project components and systems. Exclusion of any item from this list does not relieve the Contractor of any responsibilities for quality procedures covered elsewhere in the Contract.

Observation	• Per the General Conditions.
Inspection	• n/a
Testing	• n/a
Special Inspections	• n/a

1.08 Commissioning

A. Provide Commissioning procedures and products per requirements of the General Conditions. Commissioning procedures shall include, but not be limited to, the following:

Commissioning Outline	• Check mounting, ability to access, remove Fire Extinguisher

1.09 Close Out

A. Provide the following Close Out materials in accordance with the General Conditions.

Product Manuals	Maintenance and Operations instructions / manuals provided by all product / material manufacturers.
System Manuals	Maintenance and Operations instructions / manuals provided by subcontractors for assemblies / systems.
Maintenance Tools and materials	• n/a

1.10 Warranty

A. Provide written warranty in accordance with the General Conditions

Warranty Form	• n/a

Part 2. Products

2.01 Fire Extinguisher Units

A. Provided by the City of Cupertino.

Part 3. Execution

3.01 Product Delivery, Handling, and Storage

A. Protection: Use all means necessary to protect fire extinguishers before, during, and after installation and to protect the installed work and materials of all other trades.

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.02 Surface Conditions

A. Coordination: Coordinate with all other trades required to ensure proper and adequate provision in framing and wall covering for the installation of recessed cabinets in the locations required.

3.03 Installation

A. Install the fire extinguishers where indicated on Drawings and in full accordance with all pertinent regulations and the manufacturer's recommendations, setting the top of the extinguishers no more than 5 feet above the finish floor and anchoring all components firmly in place for long life under hard use.

End of Section

This Page Intentionally Left Blank

Section 10 81 00

Bird and Pest Control Device

Part 1. General

1.01 System Description

A. EnduraNet Small Bird & Bat Exclusion Netting is constructed of black high density polyethylene (HDPE) that is abrasion, flame, rot and UV resistant. The 0.6" (15 mm) square mesh keeps out the smallest pest birds and most bats. It can be adapted to almost any bird exclusion application. All EnduraNet pieces are seamless and borderless for clean edges and easier perimeter fastening.

B. Bird Netting Hardware fastens the bird netting to all types of surface shapes and materials. A variety of netting installation tools and accessories are available to make the netting installation an efficient process.

C. Surface Cleaning System: surface disinfectants and deodorizers to neutralize potentially hazardous bird and/or animal wastes and properly prepare the surface for installation.

1.02 Quality Assurance

A. Installer to obtain, review and understand all of Nixalite of America Inc.'s planning guidelines, estimating worksheets and installation instructions for the EnduraNet Small Bird & Bat Exclusion Netting.

B. Installer must be completely familiar with the proper installation procedures for the EnduraNet Small Bird & Bat Exclusion Netting and the specified mounting system.

C. Installer must obtain and record accurate and complete dimensions that define the areas specified for enclosure by the EnduraNet Small Bird & Bat Exclusion Netting. Accurate dimensions drive the bird netting and net hardware quantities. Accurate dimensions ensure accurate quotations and material orders.

D. Installer should contact manufacturer for any updated or newly developed planning or procedural information that may be pertinent to the EnduraNet Small Bird & Bat Exclusion Netting installation.

1.03 Submittals

A. Manufacturer's literature including EnduraNet Small Bird & Bat Exclusion Netting brochures and installation guidelines. All guides for installing the specified bird netting hardware system and the specified surface cleaning system.

B. Sample of the EnduraNet Small Bird & Bat Exclusion Netting. EnduraNet sample to be at least 4" (10.16 cm) square.

C. Contractor to complete estimate worksheet detailing the scope of the netting enclosure, and the mounting hardware type, location and spacing.

1.04 Storage & Handling

A. Provide storage to keep all EnduraNet Small Bird & Bat Exclusion Netting system boxes dry, clean and undamaged. Do not stack or place other packaging or objects on the bird netting shipping boxes.

B. Keep the EnduraNet Small Bird & Bat Exclusion Netting system in original packaging until needed for installation.

Part 2. Products

2.01 Acceptable Manufacturer

A. Nixalite of America Inc
1025 16th Avenue, PO Box 727, Dept. NI, East Moline, Illinois 61244; U.S.A.
P: 800.624.1189 or 309.755.8771 - F: 800.624.1196 or 309.755.0077
E: birdcontrol@nixalite.com or planning@nixalite.com
www.nixalite.com

B. ABC Advanced Bird Control – A division of Nixalite of America Inc.
PO Box 727, Dept. NI, East Moline, Illinois 61244, U.S.A.
P: 888.212.8682 or 309.755.4708 - F: 309.755.1865
E: info@abcbirdcontrol.com
www.abcbirdcontrol.com

C. Or approved equal.

2.02 Enduranet Small Bird & Bat Exclusion Netting

A. **Material:** High density polyethylene (HDPE) that is abrasion, UV, flame and rot resistant. Netting to be water proof. Resulting EnduraNet Small Bird & Bat Exclusion Netting is ideal for all bird and bat exclusion applications.

B. **Colors:** Black.

C. **Construction**: Knotted square mesh netting. Comprised of both 0.6" (15 mm) square mesh. All EnduraNet Small Bird & Bat Exclusion Netting pieces are seamless and borderless for clean edges and easier perimeter fastening.

D. **Mesh size & Applications:**
0.6" (15 mm) square mesh for all birds and most bat species.

E. **EnduraNet Netting Sizes**:
Widths: 25' (7.6m).
Lengths: 25' (7.6m), 50' (15.2m) and 100' (30.4m).

F. **Warranties:**
Black Bird-Net HT has a 5 year limited warranty.

G. **Thermal & Physical Properties**:
Melting point: 250 F^{o} (145 ^{o}C)+.
Can withstand 500^{o}F (260 ^{o}C) for short period of time
Remains flexible at very low temperatures.
Specific gravity: 0.96 – will not absorb water.
Chemically inert. Resistant to acids and alkalis at room temperature.

2.03 Bird Netting Hardware

A. Installer to contact manufacturer for up-to-date information and recommendations for bird netting hardware applications, item combinations as well as new items and procedures.

B. Available in Tensioned Cable Hardware system, the Poly Hardware system or a hybrid system that combines methods from different fastening procedures. Choose the hardware system that best suits the netting installation and conditions.

C. Tensioned Perimeter and Support Cable Hardware System: Choose the Connection, Corner, Cable Guide and Finishing hardware that best suits the installation surface. Net Hardware can be mixed to suit changing surface materials and conditions.

D. Net Cable & Connection Hardware:

1. **Net Cable:** Aircraft grade, all stainless steel, 7 x 7 (49 strand), 3/32" (2.2 mm) diameter cable with 900 lb. (407 kg) breaking strength. Net Cable comes in 250' (76.2 m) and 500' (152.4 m) spools.
2. **Turnbuckles:** Stainless steel, hook & eye turnbuckles. The size of the turnbuckle is determined by the maximum continuous cable length of any one cable run.
   For one **Small Turnbuckle** the max continuous cable length is 25 ft. (7.6 m).
   For one **Medium Turnbuckle** the max continuous cable length: 50 ft. (15.2 m).
   For one **Large Turnbuckle** the max continuous cable length: 75 ft. (22.9 m).
3. **Net Ferrules:** Zinc plated copper core crush ferrules for 3/32" (2.2 mm) dia. cable. Acceptable connection when the max continuous cable length is 25 ft. (7.6 m) **OR LESS**. Always use at least 2 ferrules per cable loop connection. Always use Nixalite's Cable Swaging Tool to crush the ferrules onto the cable at all loop connections. Always use a Cable Thimble with Net Ferrules.
4. **Wire Rope Clamps**: Galvanized or stainless steel wire rope clamps for 3/32" (2.2 mm) diameter cable. Mandatory for all loop connections on cable runs of 25' (7.6 m) **OR MORE**. Always use 2 clamps per cable loop connection. Always use a Net Cable Thimble with wire rope clamps. Use the appropriate wrench or hex driver to tighten the Wire Rope Clamp around the Net Cable at all loop connections.
5. **Cable Thimble:** Forged stainless steel Cable Thimble for 3/32" (2.2 mm) diameter cable. The Thimble prevents cable fraying and creasing when creating loop connections and/or tensioning the Net Cable after installation. One Thimble is required for each loop connection.

E. Corner Hardware (Anchoring):

1. **Eyebolts:** Use as corner hardware in steel, thick sheet steel, cast iron, masonry and stone (with Machine Screw Anchors). Extreme duty stainless steel eyebolt, 2" (51 mm) long, 9/16" I.D. (14.3 mm) with 1/4-20 NC threads and stainless steel hex nut. Maximum distance between eyebolts: 50' (15.2 m).

   To fasten to Steel: If back of steel is accessible, drill clearance hole for stem, apply adhesive in hole, install eyebolt and use ¼ - 20 NC hex nut to secure. If back of steel is not accessible, drill then tap the hole for ¼ - 20 NC thread. Apply adhesive into hole, apply thread locker on eyebolt threads. Install the eyebolt.
   To fasten to Masonry: Drill the recommended hole diameter and depth in the masonry surface to receive the Machine Screw Anchors. Apply adhesive/sealer in the hole. Push Machine Screw Anchor into the hole and seat it properly with the Setting Tool. Thread eyebolt into the anchor threads until tight.
2. **Screw Eyes:** Use as corner hardware in wood and wood core surfaces. Extreme duty stainless steel screw eyes 2" (51 mm) long, 17/32" I.D. (13.5 mm). Pilot holes recommended. Apply adhesive sealer into pilot holes before installing the Screw Eyes. Maximum spacing between screw eyes: 50' (15.2 m).
3. **Machine Screw Anchor:** Zinc plated anchor – 1/2" (12.7 mm) diameter x 1" (25.4 mm) deep with 1/4-20 threads inside. Setting tool included with anchors.

F. Cable Guide Hardware:

1. **Small Screw Eyes:** Use to keep cable close to the installation surface. Use on wood, sheet metal and wood core surfaces. Heavy duty, stainless steel, 1-3/16" long x 7/32" I.D. (31 mm long x 5.3 mm I.D.). Maximum spacing: 24" (61 cm) O. C. Pilot holes recommended. Apply adhesive/sealer in all pilot holes before installing the Screw Eyes.

2. **Small Eyebolts:** Use to keep cable close to the installation surface. Use on steel, thick sheet metal and masonry surfaces. Heavy duty, stainless steel, 1 3/8" long x 9/32" I.D. (35 mm long x 7.1 mm I.D.) with stainless steel hex nut. Maximum spacing: 24" (61 cm) O. C.

   To fasten to Steel: If back of steel is accessible, drill clearance hole for stem, apply adhesive in hole, install eyebolt and use 10 - 24 NC hex nut to secure. If back of steel is not accessible, drill then tap the hole for 10-24 NC thread. Apply adhesive into hole, apply thread locker on eyebolt threads and install the eyebolt.

   To fasten to Masonry: Drill the recommended hole diameter and depth in the masonry surface to receive the Machine Screw Anchors. Apply adhesive/sealer in the hole. Push Machine Screw Anchor into the hole and seat it properly with the Setting Tool. Thread eyebolt into the anchor threads until tight.
3. **Sidewinders:** for heavy gauge sheet metal, structural steel up to 1/2" thick and masonry surfaces. Maximum spacing: 24" (61 cm) O. C. All Sidewinders to be installed with the Sammy Socket. No substitutions.
   Sidewinders for steel are self-drill, self-tap items, no pilot hole is required. Sidewinders for concrete require ¼" (6.35 mm) diameter and 2" (50.8 mm) deep drilled holes. Apply adhesive/sealer into the drilled holes and install the Sidewinder Sammy Socket Driver.
4. **E-Z Clip:** Use to keep cable close to the installation surface. Stainless steel bracket holds cable very tight to surface. Used on all types of installation surfaces. E-Z Clip has mounting hole(s) for 1/8" shank screws or nails (not supplied).
5. **Hammer-On Flange Clips:** Used to keep cable close to the installation surface. Hammer-On Flange Clips are available in block oxide coated spring steel or stainless steel. Hammer-On Flange Clips routes the Net Cable parallel to the outer edges of beams or other structural steel flanges. Contact manufacturer for installation guidelines.
6. **Stainless Steel Angle Bracket:** Used to keep the Net Cable close to the installation surface. A 90^{o} stainless steel angle bracket with two (2) holes – one for mounting the other for the cable. Fasten with the appropriate fastener (not supplied). Use stainless steel screws or nails. Apply adhesive/sealer over head of installed hardware.
7. **HD Stainless Steel Cable Clamp:** Used to keep the Net Cable close to the installation surface. A heavy duty saw-tooth edge clamp that fits up to ¾" (19.0 mm) thick steel. Routes the Net Cable parallel to the outer edges of beams, plates and other structural steel flanges. Contact manufacturer for installation guidelines.
8. **Stainless Steel J-Clamp:** Used to keep the Net Cable close to the installation surface. A J-shaped strap of stainless steel with mounting and cable guide holes. Fasten with the appropriate fastener (not supplied). Use stainless steel screws or nails. Apply adhesive/sealer over head of installed hardware.
9. **Stainless Steel Lag Screw w/eyelet:** Used to keep the Net Cable close to the installation surface. Fastens to wood, composite, wood core products. Drill pilot hole, apply adhesive/sealant in pilot, install Lag Screw so eyelet is no more than ½" (12.7 mm) above the installation surface.

G. **Finishing Hardware:**

1. **Net Rings:** Three (3) styles of stainless steel net rings used to attach the netting mesh to the cables, to close openings in the netting mesh and to fasten the Net Zippers to the netting.
   Net ring quantity requirements per attachment:
   Netting to Cable: 20 net rings per foot (each netting mesh).
   Lapped Seams: 40 net rings per foot (1 ring per mesh on each side of seam).
   Net Zipper Installation: 40 net rings per foot (1 ring per mesh on each side of zipper).
2. **Net Zipper:** Allows for access to areas behind the bird netting installation. Available in black and in 2 ft. (61 cm), 4 ft. (122 cm), 6 ft. (183 cm) and 8 ft. (244 cm) lengths. Heavy duty, marine-grade, black Net Zipper with 3/4" (1.9 cm) heavy fabric tape, open top and auto lock slider.

H. **Poly Hardware:** All poly hardware is made from UV stabilized black polypropylene. While it can be used to install the EnduraNet Small Bird & Bat Exclusion Netting, it is more commonly used with the PollyNet line of bird exclusion netting. Poly Hardware combinations can be mixed to suit changing surface materials and conditions.

1. **Poly Clip:** Perimeter fastening. The Poly Clip can be fastened to the cable of a tensioned perimeter cable system or it can be snapped shut over the outer edges of the bird netting. Secure to the installation surface with the appropriate fastener (not supplied). Maximum spacing: 12" (30.5 cm) O. C.
2. **Net Ties:** Multi-purpose fastener. Quickly fastens the netting fabric to all types of objects. Use to prevent netting sag or loose fitting nets by securing the netting to objects above or behind netting installation. Three sizes to choose from.
3. **Poly Cord:** Multi-purpose fastener. Reinforce seams, patch tears, close circular openings, use for overhead support. NOT for perimeter fastening.

2.04 Surface Disinfectants

A. Steri-Fab: Surface disinfectant and bactericide designed to neutralize bird waste, making it safe for removal. Steri-Fab quickly kills disease causing bacteria, parasites, fungi, insects, etc. This is a non-residual product. It becomes completely inert after it dries. Do not use with Microcide-SQ on the same surface at the same time.

B. Microcide-SQ: A broad spectrum disinfectant, cleaner and deodorizer used to sanitize hard surfaces as well as fabrics and clothing. Use to kill a wide spectrum of organisms and disease causing bacteria. Do not use with Steri-Fab on the same surface at the same time.

C. Microsan: Anti-microbial personal protection products to help prevent disease transmittal before, during and after working on and around surfaces contaminated with bird and animal wastes. Use to compliment personal protection equipment standards (PPE).

D. Safety Equipment: Nixalite offers personal protection equipment (PPE) to protect personnel from the hazards related to pest bird and animal waste materials

Part 3. Execution

3.01 Inspection

A. Visually inspect the surfaces that will receive the netting hardware and all areas that will end up behind or inside the netting installation. Note damaged surfaces or incomplete construction that could compromise the bird netting installation.

B. Note all areas, surfaces or objects that may require maintenance or periodic replacement after the bird netting is installed (i.e. lights, electrical equipment, etc.). Use the appropriate netting accessories to allow access behind the installed netting system.

C. Note any objects or conditions that could damage the installed bird netting. Install the EnduraNet in such a manner as to avoid these conditions.

3.02 Preparation

A. Field Measurements: Verify the dimensions for each area specified for enclosure with the EnduraNet Small Bird & Bat Exclusion Netting. Use manufacturers Planning Guides and Estimate Worksheets to verify that sufficient quantity of bird netting and net hardware will be installed at each location specified for bird netting.

B. Make sure all installation surface finishing requirements have been accomplished before installing the EnduraNet Small Bird & Bat Exclusion Netting. Bird netting is to be the last item installed on each specified surface. DO NOT apply any surface coating or treatment (paint, sealer, etc.) over or on the installed EnduraNet Small Bird & Bat Exclusion Netting or the mounting hardware.

3.03 Surface Cleaning

A. All surfaces to be clean, dry and free of obstructions before the EnduraNet Small Bird & Bat Exclusion Netting is installed.

B. If Bird Waste Is Present:

Treat, neutralize and safely remove all bird waste from installation surfaces. Installer must follow all municipal, state and federal regulations regarding the proper removal and disposal of bird droppings and waste materials such as nests and dead birds.

C. Use Nixalite's surface cleaning products to neutralize any bird droppings, nests and related waste materials that may be present. Allow all surfaces to air dry completely, and then reapply to sanitize and deodorize the surface before proceeding. Strictly follow treatment instructions provided with Nixalite's surface cleaning products.

D. Use Nixalite anti-microbial and anti-bacterial personal protection products to help prevent disease transmittal when working around surfaces contaminated with bird droppings.

3.04 Installation

A. Make sure the installation surfaces are clean, dry and free of any debris or obstructions.

B. Install the bird netting hardware as recommended by manufacturer. General order of installation is to install all the Corner hardware, cable guides and connection hardware. Run the Net Cable through the net hardware. Leave the turnbuckles loose.

C. Install EnduraNet Small Bird & Bat Exclusion Netting as recommended by the manufacturer. If necessary cut the EnduraNet to fit the area. If multiple pieces are needed, join the pieces together with the recommended Net Ring hardware. Use the Net Rings to fasten the netting mesh to the perimeter and support cables. Tighten the turnbuckles to eliminate any wrinkles in the netting.

D. Install EnduraNet Small Bird & Bat Exclusion Netting to avoid contact with machinery, vehicles, extreme heat, tree branches, etc. Make necessary adjustments to keep netting a sufficient distance from these objects or conditions.

E. Finished EnduraNet installation to be taught, free of wrinkles, gaps and openings.

3.05 Adjustments / Cleaning

A. Remove net or cable hardware debris and waste from project site. Inspect finished installation. Make any adjustments needed to conform to Nixalite's bird netting installation guidelines.

B. EnduraNet Small Bird & Bat Exclusion Netting is a physical and passive barrier. It relies on optimal placement and proper installation. Exclusion netting must block off or seal up all routes and paths that pest birds follow to their preferred roosts. Periodic inspections are recommended to make sure the bird netting stays in good condition.

C. Note any holes, gaps or openings in the bird net installation that birds can use to bypass or get around the netting barrier. Correct these conditions immediately.

End of Section

This Page Intentionally Left Blank

Section 16 10 00

General Electrical Requirements

Part 1. General

1.01 Description of Work

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations that are shown on the Drawings, included in these specifications, or otherwise needed for a complete and fully operating facility.

B. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Related Work

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of the General Conditions and apply to all Sections of The General Conditions6.

1.03 Submittals

A. As specified in The General Conditions. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contact compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Organize submittals for equipment and items related to each specification section together as a package.

C. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

D. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect’s decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

E. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

F. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which is a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.04 Quality Assurance

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

1. California Electrical Code (CEC).

2. Occupational Safety and Health Act (OSHA) standards.

3. All applicable local codes, rules and regulations.

4. Electrical Contractor shall posses a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.05 Drawings

A. Drawings: The electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.

3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Architect for approval.

4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.

5. All drawings and divisions of these specifications shall be considered as whole. This contractor shall report any apparent discrepancies to the Architect prior to submitting bids.

6. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.06 Closeout Submittals

A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified in the General Conditions.

1.07 Coordination

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.

B. Provide and install all trenching, backfilling, conduit, pull boxes, splice boxes, etc. for all Utility Company services to the locations indicated on the Drawings. All materials and construction shall be in accordance with the requirements for all the Utility Companies. Prior to performing any work, the Electrical Contractor shall coordinate with the various Utility Companies to verify that all such work and materials shown on the Drawings are of sufficient sizes and correctly located to provide services on the site. The Electrical Contractor shall verify with all the Utility Companies that additional contractor furnished and installed work is not required. If additional work, materials, or changes are required by any of the Utility Companies, the Electrical Contractor shall advise the Architect of such changes and no further work shall then be performed until instructed to do so by the Architect.

C. Utility Company charges shall be paid by the Owner.

D. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

D. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

E. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 Job Conditions

A. Operations: Perform all work in compliance with the General Conditions.

1. Keep the number and duration of power shutdown periods to a minimum.

2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.

3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: Unless otherwise noted in The General Conditions of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner's on site source. Energy costs shall be paid for by the Owner

C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 Damaged Products

A. Notify the Architect in writing in the event that any equipment or material is damaged. Obtain approval from the Architect before making repairs to damaged products.

1.10 Locations

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.11 Safety and Indemnity

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

D. The project work area does not contain asbestos materials. However, if a work area is encountered that does contain asbestos materials, the contractor is advised to coordinate with the owner and it's asbestos abatement consultant all measures necessary to provide installation of conduit, and hangers. All asbestos containing materials related work shall conform to the directions given by the owner. Nothing herein shall be construed to create a liability for American Consulting Engineers regarding asbestos abatement measures.

1.12 Access Panels and Doors

A. The Contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14” x 14” in usable opening. Where access by a service person is required, minimum usable opening shall be 18” x 24”.

B. All access doors installed lower than 7’-0” above finished floor and exposed to public access shall have keyed locks.

C. Where specific information or details relating to access panels differ from these specifications, shown on drawings and or details or on other Divisions of work, these requirements shall supersede these specifications.

D. Approved Manufacturers: Subject to compliance with requirements under Architectural Specifications, Milcor, Karp, Nystrom or Cesco.

1. Milcor Style K (plaster)

2. Milcor Style DW (gypsum board)

3. Milcor Style M (masonry)

4. Milcor Style “Fire Rated” where required.

Part 2. Products

2.01 Standard of Quality

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the Architect prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.02 Nameplates

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.03 Fasteners

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.04 Finish Requirements

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

Part 3. Execution

3.01 Workmanship

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the NECA Standard of Installation Manual and Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installations

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per Title 24, part 2, table 16a-o, part 3.

D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 Field Tests

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Architect prior to any test so that the tests may witnessed.

C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Architect. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the Architect when testing is complete. All tests shall be witnessed by the Architect. These records shall include:

1. Name of equipment tested.

2. Date of report.

3. Date of test.

4. Description of test setup.

5. Identification and rating of test equipment.

6. Test results and data.

7. Name of person performing test.

8. Owner or Architect's initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.04 Cleaning Equipment

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

3.05 Painting of Equipment

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.06 Records

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.

2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Size of all conduit runs.

4. Routes of concealed conduit runs and conduit runs below grade.

5. Homerun points of all branch circuit.

6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.

7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.

8. As Builts: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked up Drawings to the Architect for his use in preparing "as built" plans.

9. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.07 Clean Up

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.08 Mechanical and Plumbing Electrical Work

A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:

1. Mechanical and Plumbing Drawings.

2. Mechanical and Plumbing sections of these Specifications.

3. Manufacturers of the Mechanical and Plumbing equipment supplied.

B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.

C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:

1. Line voltage conduit and wiring.

2. Disconnect switches.

3. Manual line voltage controls.

D. Automatic line voltage controls and magnetic starters unless otherwise noted, shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. All line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.

E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduits, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

F. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

3.09 Access Doors

A. The Electrical Contractor shall furnish and install access doors wherever required whether shown or not for easy maintenance of electrical systems: As an example, fire alarm devices, controls, junction boxes, etc. Access doors shall provide for complete access to equipment for both removal and replacement of equipment.

End of Section

Section 16 10 06

Grounding

Part 1. General

1.01 Description of Work

A. The work of this section consists of furnishing, installing, connection and testing of all grounding systems as specified herein and as shown on the Drawings.

1.02 Related Work

A. See the following specification sections for work related to work in this section.

1. Section 16 10 00- Electrical General Requirements.

2. Section 16 12 00- Low Voltage Wire and Cable

1.03 Submittals: In accordance with Section 16010 Submittals.

A. Submit manufacturer's literature for review.

1.04 Standards and Codes

A. American Society for Testing and Materials (ASTM) Publication:

1. B8-1986, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

2. B228-1988, Copper Clad Steel Conductors Specification.

B. The latest editions following applicable codes:

1. California Electrical Code (CEC).

2. Occupational Safety and Health Act (OSHA) standards.

3. All applicable local codes, rules and regulations.

1.05 Quality Assurance

A. Each and every concealed connection must be inspected by the Owner's Representative before it is covered up by the Contractor.

Part 2. Products

2.01 General

A. The grounding system shall consist of the grounding conductors, ground bus, ground fittings and clamps, and bonding conductors as shown on the Drawings and as required by codes and local authorities.

2.02 System Components

A. Ground Rods: Ground rods shall be cone pointed copper clad Grade 40 HS steel rods conforming to ASTM B228. The welded copper encased steel rod shall have a conductivity of not less than 27% of pure copper. Rods shall be not less than 3/4-inch in diameter and ten feet long, unless otherwise indicated. Rods longer than ten feet shall be make up of ten foot units joined together with threaded couplings. The manufacturer's trademark shall be stamped near the top.

B. Ground Conductors: Buried conductors shall be medium-hard drawn bare copper; other conductors shall be soft drawn copper. Sizes over No. 6 AWG shall be stranded conforming to ASTM B8. In all conduit runs, a green insulated copper ground wire, sized to comply with codes, shall be installed.

C. Ground Connections: Exposed ground connections shall be high copper alloy bolted pressure types or exothermically welded type as notes. Buried connections shall be either exothermically welded type or approved compression types for connection of copper to copper or copper to steel, as required. Lug for attachment of cables to steel enclosures shall be of the binding post type with a 1/2-13NC stud. Each post shall accommodate cables from #4 AWG to #2/0 AWG.

D. Ground Rod Boxes: Boxes shall be nine-inch diameter precast concrete units with cast iron traffic covers. Units shall be 12 inches deep. Covers shall be embossed with the wording "Ground Rod".

E. Ground Bus: 2” x 1/4” x (length as specified on drawings) copper busbar. Provide isolation stand off bushings. Provide drilled and tapped 3/8” diameter holes on 2 foot centers. Provide “ALCU” lugs and bronze bolts. Connect busbar to main grounding system and bond to metallic domestic cold water pipe with #8 ground conductor.

Part 3. Execution

3.01 Installation

A. Ground all equipment, including, but not limited to, panel boards, terminal cabinets and outlet boxes, for which a ground connection is required per the NEC, even though not specifically shown on the Drawings.

B. The ground pole of receptacles shall be connected to their outlet boxes by means of a copper ground wire connecting to a screw in the back of the box.

C. Provide a ground rod box for each ground rod so as to permit ready access for the connection and/or removal of any pressure connectors to facilitate testing.

D. Where ground rods must be driven to depths over ten feet, increase rod diameter used, sufficiently to prevent the rod from bending or being damaged.

E. Make embedded or buried ground connections, taps and splices with exothermically welded connections or approved compression type connectors.

F. Make connections of grounding conductors to equipment ground buses and enclosures using binding post type connectors.

G. Effectively bond structural steel for buildings to the grounding system, "UFER" ground.

H. Install a ground rod in each primary handhole. Connect the ground conductor installed for each primary duct bank to the ground rod in each handhole. Bond metal conduits to handhole ground rod.

3.02 Testing

A. Conduct ground resistance tests using a ground resistance tester with a scale reading of 25 ohms maximum.

B. Test methods shall conform to IEEE Standard 81 using the three electrode method. Conduct test only after a period of not less than 48 hours of dry weather.

C. Take resistance readings for each ground rod individually and for each system as a whole without benefit of chemical treatment or other artificial means. Ground resistance readings shall not exceed 25 ohms. If readings are not to the Contracting Officer's approval, provide lengthened or additional ground rods (maximum of two additional rods).

D. Furnish to the Owner's Representative a test report with recorded data of each ground rod location and each system.

End of Section

This page intentionally left blank

Section 16 11 00

Conduits, Raceways and Fittings

Part 1. General

1.01 Description of Work

A. The work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 Related Work

A. See the following specification sections for work related to the work in this section:

1. 16 11 20 Underground Ducts.
2. 16 11 30 In Grade Pull Boxes
3. 16 12 00 Low Voltage Wire and Cable.
4. 16 13 00 Junction and Pull Boxes

1.03 Submittals

A. As specified in Division 1.

1. Catalog Data: Provide manufacturer's descriptive literature.
2. Single Submittal: A single complete submittal is required for all products covered by this Section.

Part 2. Products

2.01 Conduits, Raceways

A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or setscrew type.

B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.

C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.

D. Rigid Non-metallic Conduit: Rigid non-metallic conduit shall be PVC Schedule 40 (PVC-40 or NEMA Type EPC-40) conduit approved for underground use and for use with 90°C wires.

E. The use of “MC Cable shall not be permitted without written approval.

2.02 Conduit Supports

A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.

B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.

C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.

D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 Fittings

A. Provide threaded-type couplings and connectors for rigid steel conduits. Provide compression (watertight) steel type (die-cast zinc or malleable iron type fittings not allowed), or setscrew type for EMT. Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.

B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.

C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; setscrew type and compression-type are not acceptable.

D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.

E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryvile, CT, or approved equal. Threadless coupling shall not be used.

F. Bushings

1. Bushings shall be the insulated type.
2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

G. Conduit Sealants

1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

Part 3. EXECUTION

3.01 Conduit, Raceway and Fitting Installation

A. For conduit runs exposed to weather provide rigid metal (GRS).

B. For conduit run underground, in concrete or masonry block walls and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.

C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.

D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.

E. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.

F. Installation shall comply with the CEC.

G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 270 degrees.

H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.

1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.
   a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.
   b. Group exposed conduits together. Arrange such conduits uniformly and neatly.
2. Support all conduits within three feet of any junction box, coupling, bind or fixture.
3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.

H. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).

I. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with risers. Rigid steel shall be half-lap wrapped with 20-mil tape and extend minimum 12" above grade.

J. Provide a nylon pull cord in each empty raceway.

K. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.

L. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.

M. Conduits shall be blown out and swabbed prior to pulling wires.

End of Section

This page intentionally left blank

Section 16 11 12

Underground Ducts

Part 1. General

1.01 Description of Work:

A. The work of this section consists of furnishing and installing raceways, raceway spacers and encasing material with necessary excavation for underground ducts.

B. Encasement - Encasement shall be sand for all other raceways.

C. Where required - All raceways, where run underground in and excavation shall be installed in compliance with the requirements of this Section. Conduits run underground without encasement shall be as indicated in the Drawings.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.
1. 16 11 00 Conduit Raceway and Fittings
2. 31 10 00 Site Clearing
3. 31 20 00 Earth Moving
4. 31 23 33 Trench Backfilling
5. 32 12 16 Asphalt Paving
6. 32 13 12 Concrete Paving

1.03 Standards and Codes:

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.

B. National Fire Protection Association (NFPA), National Electrical Code (NEC) - Latest Revision:
1. Underground Installations NEC - Article 300
2. Rigid Nonmetallic Conduit NEC - Article 347

C. California Electrical Code (CEC).

D. Construction of Underground Electric Supply and Communication Systems, State of California Public Utilities Commission, General Order No. 128.

1.04 Submittals:

A. As specified in Division 1 and Section 16 10 00.

B. Catalog Data: Provide manufacturer's descriptive literature.

C. Single Submittal: A single complete submittal is required for all products covered by this Section.

Part 2. Products

2.01 Raceways:

A. As specified in Section 16110 Conduits, Raceways and Fittings.

2.02 Spacers:

A. Molded plastic as furnished by the raceway manufacturer, to cradle and position the raceways in the excavation for placing the encasement.

B. Shape to accurately fit the raceway, provide the correct raceway spacing, to interlock in place and stack.

Part 3 Execution

3.01 Excavation:

A. As specified in Section 31 20 00, Excavation and Backfill and as required for the work shown on the Drawings.

3.02 Raceway:

A. Install raceways in spacers. Spacers installed at intervals of five feet and within one inch each side of all bends and joints.

B. Solvent weld connections.

3.03 Sand Encasement:

A. As shown on drawings and specified in Section 31 23 33 - Excavation and Backfill.

3.04 Backfill:

A. As shown on drawings and specified in Section 31 23 33 - Excavation and Backfill.

End of Section

Section 16 11 13

In Grade Pull Boxes

Part 1. General

1.01 Description of Work:

A. The work of this section consists of providing all labor, supervision, tools, materials, and performing all work necessary to furnish and install pre-cast concrete vaults, and pull boxes with necessary excavation.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.
1. 03 10 00 Formwork.
2. 03 20 00 Reinforcing Steel.
3. 03 30 00 Cast in Place Concrete
4. 16 11 20 Underground Ducts
5. 31 10 00 Site Clearing
6. 31 20 00 Earth Moving
7. 31 23 33 Trench Backfilling
8. 32 12 16 Asphalt Paving
9. 32 13 12 Concrete Paving

1.03 Standards and Codes:

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.
1. National Fire Protection Association (NFPA), National Electrical Code (NEC) - Latest Revision.
2. California Electrical Code (CEC).
3. American Society for Testing and Materials (ASTM):
   a. A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
   b. A 615 - Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.
   c. C 33 - Concrete Aggregates.
   d. C 478 - Pre-cast Reinforced Concrete Vault Sections, Specification for.

1.04 Submittals:

1.05 As specified in Division 1 and Section 16 10 00.

A. Catalog Data: Provide manufacturer's descriptive literature.

B. Single Submittal: A single complete submittal is required for all products covered by this Section.

Part 2. Products

2.01 Materials and Equipment:

A. General Requirements:

1. Concrete vaults and pull boxes for electrical power, controls and other communication circuits shall consist of pre-cast reinforced concrete boxes, extensions' bases, and covers as specified herein and as indicated on the Drawings. Pre-cast units shall be the product of a manufacturer regularly engaged in the manufacture of pre-cast vaults and pull boxes. Acceptable manufacturers are Christy, Utility Vault, Brooks, Associated Concrete or equal.

B. Construction:

1. Pre-cast concrete vaults and pull boxes for electrical power distribution and communication circuits with associated risers and tops shall conform to ASTM C478 and ACI 318. Vaults and pull boxes shall be the type noted on the Drawings and shall be constructed in accordance with the applicable details as shown. Tops, walls and bottoms shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. Duct entrances and windows shall be located near the corners of structures to facilitate cable racking. Provide all necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place prior to pouring concrete. A pulling-in iron shall be installed in the wall opposite each duct entrance. All steel other than "rebar" shall be hot dipped galvanized after fabrication.

C. Cable Racks:

1. Vaults shall be provided with galvanized cable racks, including rack arms and insulators, and shall be adequate to accommodate the indicated cables; porcelain insulators shall be provided for electrical vaults only.

D. Covers:

1. The word "ELECTRICAL" shall be cast in the top face of all electrical power vault and cable boxes.
2. The words "FIRE ALARM" shall be cast in the top face of all fire alarm vault and cable boxes.
3. The word "SIGNAL" shall be cast in the top face of all telecom, intercom, CATV, data, EMS, security and/or clock vault and cable boxes.

E. Sumps:

1. Where indicated on the drawings, drain sumps shall be provided.

F. Concrete:

1. Aggregates used in the concrete mix, either coarse or fine, excluding light weight aggregates, shall conform to ASTM C 33. Aggregates shall be properly graded and free of deleterious substances to produce a homogeneous concrete mix when blended with cement.

G. Cement:

1. The cement shall be Type II low alkali Portland cement and shall meet the requirement of ASTM C 150.

H. Compressive Strength:

1. Sufficient cement content shall be used per batch to produce a minimum compressive strength of 3,000 psi at 28 days.

I. Reinforcing Steel:
1. Welded wire mesh for street lighting boxes shall conform to ASTM A 185.
2. Reinforcing bars for primary and secondary electrical vaults and pull boxed, and communication vaults and pull boxes shall be intermediate grade billet steel conforming to ASTM A 615.

J. Ladders:

1. Ladders for vaults shall be sized as required, stationary galvanized steel.

Part 3. Execution

3.01 Installation:

A. Pre-cast vaults and pull boxes shall be installed approximately where indicated on the Drawings. The exact location of each vault or pull box shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. All vaults, cable boxes and secondary pull boxes shall be installed with a minimum of 6-inch thick crushed rock or sand bedding.

B. Paved areas:

1. Vaults and pull boxes located in areas to be paved shall be installed such that the top of the cover shall be flush with the finished surface of the paving.

C. Unpaved Areas:

1. In unpaved areas, the top of vaults and pull box covers shall be approximately 2 inches above finished grade.

D. Joint Seals:

1. Section joints of pre-cast vaults and pull boxes shall be sealed with compound as recommended by the manufacturer.

E. Trenching, Backfilling, and Compaction:

1. Trenching, backfilling and compaction shall be as specified in Section 31 23 33 - Excavation and Backfill.

F. Grounding:

1. Ground rods an associated copper ground loop shall be installed in all vaults. Ground loop shall be properly connected to the cable shielding, at each cable joint or splice by means of a minimum number 4 AWG or equivalent braided tinned copper wire. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a

distance of two inches above and six inches below concrete penetrations. Ground wires shall be neatly and firmly attached to vault cable support racks.

End of Section

Section 16 12 00

Low Voltage Wire and Cable

Part 1. General

1.01 Description of Work

A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.02 Related Work

A. See the following Specification Section for work related to the work in this Section:

1. 16 11 00 Conduits, Raceways and Fittings.

2. 16 13 00 Junction and Pull Boxes.

1.03 Submittals

A. In accordance with the General Conditions.

B. Submit complete material list with the manufacturer's specifications and published descriptive literature for all materials proposed for use.

1.04 Quality Assurance

A. Field tests shall be performed as specified in paragraph 3.04 of this Section.

Part 2. Products

2.01 Conductors

A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 600 volt rated insullation.Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.

B. Conductors shall be stranded except that sizes #10 and smaller for receptacle circuits shall be solid and of the sizes indicated.

C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.

D. All conductors used on this Project shall be of the same type and conductor material

2.02 Cables

A. All individual conductors shall be copper with type THHN/THWN, 600 volt rated insulation.

B. Insulation Marking - All insulated conductors shall be identified with printing colored to contrast with the insulation color.

C. Color Coding - As specified in paragraph 3.03.

D. Special Wiring - Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.

E. Other Wiring - Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner's Representative.

F. Manufacturer - Acceptable manufacturers including Cablec, Southwire, or equal.

2.03 Terminations

A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.

B. Cable Termination for Copper - Crimp style two hole NEMA spade terminals designed and rated for copper cable.

C. Wire Terminations - Crimp on ring-tongue terminals, insulated sleeve, of proper size for the wire used.

D. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

2.04 Tape

A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

Part 3. Execution

3.01 Cable Installation

A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 16110 - Conduits Raceway and Fittings.

B. Cable Pulling - Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.

C. Bending Radius - Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.

D. Equipment Grounding Conductors - Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in all conduits or all raceways.

E. Panelboard Wiring - In panels, bundle incoming wire and cables which are No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.

F. Provide #10awg conductors for all 20 amp 120v branch circuits over 100 feet.

3.02 Cable Terminations and Splices

A. Splices - UL Listed wirenuts.

B. Terminations - Shall comply with the following:

1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.

2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.03 Circuit and Conductor Identification

A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Ungrounded conductor colors shall be as follows:

VOLTAGE	208/120V	480/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.

C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

3.04 Field Tests

A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

End of Section

This page intentionally left blank

Section 16 13 00

Junction and Pull Boxes

Part 1. General

1.01 Description of Work

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations shown on the drawings, included in these Specification, or otherwise needed for a complete and fully operating facility. The work shall include but not be limited to the following:

B. Furnish and install all required material, supports and miscellaneous material for the satisfactory interconnection of all associated electrical systems.

1.02 Related Work

A. See the following specification sections for work related to the work of this section.

1. 16 10 00 General Electrical Requirements.

2. 16 11 00 Conduits, Raceway and Fittings.

3. 16 12 00 Low Voltage Wire and Cable.

1.03 Standards and Codes

A. Submit in accordance with the requirements of Section 16 10 00: Electrical General Provisions, the following items:

1. Pull boxes larger than 6"x 6"x 4".

Part 2. Products

2.01 Outlet boxes, Junction and Pull boxes

A. Standard Outlet Boxes: Galvanized, one-piece die formed or drawn steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required.

B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.

C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of controls

or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.

D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16 gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.

E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

Part 3. Execution

3.01 Outlet Boxes

A. General:

1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.

2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

B. Box Layout:

1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.

2. Locate switch outlet boxes on the latch side of doorways.

3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted.

4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.

C. Supports:

1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.

4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.

5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

3.02 Junction and Pull Boxes

A. General:

1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

2. Locate pull boxes and junction boxes in concealed locations above removable ceilings or exposed in electrical rooms, utility rooms or storage areas.

3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

5. Identify circuit numbers and panel on cover of junction box with black marker pen.

B. Box Layouts:

1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.

C. Supports:

1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.

4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

End of Section

This page intentionally left blank

Section 16 14 00

Devices Wiring

Part 1. General

1.01 Description of Work

A. The work of this section consists of:

1. Furnishing, installing, and connecting all duplex receptacles complete with wall plates and/or covers, as shown on the Drawings.
2. Furnishing, installing and connecting all single pole and three-way switches complete with wall plates and or handle operators, as shown on the Drawings.

1.02 Related Work

A. See the following specification sections for work related to the work of this section:

1. 16 11 00 Conduits, Raceways and Fittings.
2. 16 12 00 Low Voltage Wire and Cable.
3. 16 13 00 Junction and Pull Boxes.

1.03 Submittals: As specified in Division 1.

A. Submit manufacturers published descriptive literature properly marked to identify the items to be supplied.

B. A single complete submittal is required for all products covered by this Section.

Part 2. Products

2.01 Receptacles

A. General - Receptacles shall be heavy duty, high abuse, grounding type.

B. Duplex Receptacles

1. Receptacles shall be specification grade, rated 20 ampere, two-pole, 3-wire, 120 volt, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be ivory or as selected by the Architect.
2. Devices shall have a nylon composition face, back and side wired.
3. Manufacturer: Leviton #5362 Series, Hubbell #5362-I Series.

C. GFCI Receptacles

1. Device shall be Smart Lock with lockout action, rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type green indicator light, test and reset push buttons. Color shall be ivory unless otherwise noted.
2. GFCI component shall meet UL 2003 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to

158°F. Unit shall have transient voltage protection and shall have a diagnostic indication for miswiring.

3. Manufacturer: Leviton #8898-I Series.

D. GFCI Blank Face Devices

1. Device shall be Smart Lock with lockout action, rated 20 ampere, 2-pole, 3-wire, 120 volt, blank face, dead front. Face shall be nylon composition. Unit shall have a test and reset push buttons. Color shall be ivory unless otherwise noted.

2. GFCI component shall meet UL 2003 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall have a diagnostic indication for miswiring.

3. Manufacturer: Leviton #8590-I Series.

E. Surge Suppression Receptacles

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be ivory unless otherwise noted.

2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.

3. Manufacturer: Leviton #8380-I Series, Hubbell #HBL8362S Series.

2.02 Switches

A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating toggle devices. Handle color shall be ivory or as selected by the Architect.

1. Manufacturer: Leviton #1221-2I Series, Hubbell #HBL1221 Series.

B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f, Watt Stopper TS-100 or Leviton # 6215M rated for the voltage specified on drawings. Time out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

C. Motion Sensor shall be dual technology as designed by Watt Stopper DT series. Use protective wire covers in restrooms, multi-use, cafeteria, etc.

2.03 Plates

A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform to NEMA WD 1, UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.

B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.

C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.

D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.

E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

Part 3. Execution

3.01 Installation of Wiring Devices

A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.

B. Mounting Heights: Measure locations of wall outlets from the finished floor to the center of the outlet box. Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height above finished floor to center of device unless otherwise noted on Drawings shall be as follows:

1. Receptacles 18 Inches above finished floor
2. Toggle Switches 48 Inches above finished floor

C. Receptacles

1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.
2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

3.02 Installation of Wall Plates

A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.

B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.

C. Interior Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.

D. Exterior Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover type shall match box type.

E. Future Locations: Install blanking cover plates on all unused outlets.

F. All receptacles shall be labeled with panel and circuit number. Contractor shall provide 3/8" clear label tape on each wall plate with ¼" black machine lettering.

3.03 Tests

A. Receptacles

1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

End of Section

This page intentionally left blank

Section 16 47 00

Panelboards and Distribution Panels

PART 1. GENERAL

1.01 Description of Work

A. The work of this Section consists of providing panelboards and circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work

A. See the following specification sections for work related to the work in this Section.

1. 16 10 00 General Electrical Requirements
2. 16 10 06 Grounding
3. 16 12 00 Line Voltage Wire and Cable
4. 16 47 50 Circuit Breakers

1.03 Submittals

A. Shop Drawings - As specified in Division 1 and Section 16 10 00. For each panelboard and distribution panels furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Panelboard / distribution panel type.
2. Main bus and terminal connection sizes.
3. Location of line connections.
4. Cabinet dimension.
5. Gutter space.
6. Gauge of boxes and fronts.
7. Finish data.
8. Voltage rating.
9. Breaker manufacturer, types, trip rating, and interrupting ratings.
10. When information is available on the Drawings, show breaker circuit numbers and locations along with trip ratings on a panelboard layout.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit operation and maintenance data for panelboards and circuit breakers including nameplate data, parts lists, factory and field-test reports, recommended maintenance procedures and typewritten as-built panel schedules. Submit in accordance with Division 1.

1.04 Warranty

A. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for the lesser of one (1) year from the date of installation or eighteen (18) months from the date of purchase.

Part 2. Products

2.01 Panelboards

A. General: Lighting and Receptacle Panelboards shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings or, if not shown, 42 circuits. All circuit breakers shall be quick-make, quick-break, thermal-magnetic bolt-on type, with 1, 2 or 3 poles as shown, each with a single operating handle. Tandem or piggyback breakers shall not be used.

B. Nameplates:

1. Each panelboard shall have a field mounted identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings. Nameplates shall be laminated with black characters minimum 3/16" high on a white laminated background. Nameplates shall be attached with screws.

2. Each panelboard shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.

2. Panelboards and enclosures shall conform to requirements of all relevant codes. Panelboards shall be suitable for use as service equipment.

3. Panelboards shall be furnished with door-in-door or hinged trim fronts with key latch, on inner door and a typed directory card and holder. Panelboard circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Panelboard busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67.

1. Busbars shall be braced for the indicated short circuit level scheduled.

2. Busbars shall be installed completely throughout the panel for installation of both required and future breakers. Schedules indicate spaces for future breakers.

3. Busbars shall be designed so circuit breakers may be changed without machining, drilling or tapping.

4. Separate isolated Neutral and Ground busbars shall be provided. If called for on panel schedules, Neutral busbar may be oversized. Ground busbar shall be identified with green stripe and fully bonded to enclosure.

E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

F. Series ratings shall not be allowed unless specifically noted on drawings.

G. Typed Circuit Directories: All panelboards shall have typed directories identifying all circuits installed behind plastic cover provided by the panelboard manufacturer.

H. Manufacturer:

1. Panelboards shall be Square D, Siemens or approved equal.

2.02 Distribution Panels

A. General: Distribution panels shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings. All circuit breakers shall be quick-make, quick-break, thermal-magnetic bolt-on type, with 1, 2 or 3 poles a shown, each with a single operating handle. Tandem or piggyback breakers shall not be used.

B. Nameplates:

1. Each distribution board shall have a field mounted identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings. Nameplates shall be laminated with black characters minimum 3/16" high on a white laminated background. Nameplates shall be attached with screws.

2. Each distribution panel shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.

2. Distribution panels and enclosures shall conform to requirements of all relevant codes. Distribution panels shall be suitable for use as service.

3. Distribution panels shall have a front door with key latch and a typed directory card and permanently attached holder. Adhesive backed holders are not acceptable. Distribution panel's circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Distribution panel's busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67.

1. Busbars shall be braced for the indicated short circuit level scheduled.

2. Busbars shall be installed completely throughout the panel for installation of both required and future breakers. Schedules indicate spaces for future breakers.

3. Busbars shall be designed so circuit breakers may be changed without machining, drilling or tapping.

4. Separate isolated Neutral and Ground busbars shall be provided. If called for on panel schedules, Neutral busbar may be oversized. Ground busbar shall be identified with green stripe and fully bonded to enclosure.

E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

F. Series rating shall not be allowed unless specifically noted on drawings.

G. Manufacturer:

1. Distribution panels shall be Square D, Siemens or approved equal.

Part 3. Execution

3.01 Installation: Panelboards and Distribution Panels shall be installed where indicated on the Drawings, and in accordance with the manufacturer's instructions.

3.02 Installation

A. Panelboards and Distribution Panels shall be installed with the top of the box 6'-6" above the floor. Panelboards and Distribution Panels shall be plumb within 1/8-inch. The highest breaker-operating handle shall not be higher than 72 inches above the floor.

B. Floor mounted Panelboards and Distribution Panels shall be installed on a concrete house keeping slab. The concrete slab shall be a minimum of 4" above finished floor, with minimum of 6" extension beyond equipment. The concrete slab shall have a ½" chamfer. See Division 3 for concrete work requirements.

3.03 Field Tests

A. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests after all equipment has been connected, except that equipment, which may be damaged by the test voltage, shall not be connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

B. Grounding: Grounding shall conform to Section 16 10 06.

C. Continuity: Panelboard and Distribution Panel circuits shall be tested for continuity prior to energizing. Continuity tests shall be conducted using a dc device with a bell or buzzer.

End of Section

Section 16 47 50

Circuit Breakers

Part 1. General

1.01 Description of Work

A. The work of this Section consists of providing circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work: See the following Specification Sections for work related to the work in this Section.

A. 16 10 00 General Electrical Requirements

B. 16 42 50 Switchboards

C. 16 47 00 Panelboards and Distribution Panels

1.03 Submittals

A. Shop Drawings - Submittals shall be in accordance with Division 1. For each circuit breaker furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Terminal connection sizes.

2. Voltage rating.

3. Breaker manufacturer, types, trip ratings and interrupting ratings.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit in accordance with Division 1 and Section 16010, operation and maintenance data for circuit breakers including nameplate data, parts lists, manufacturer's circuit breaker timer, current, coordination curves, factory and field test reports and recommended maintenance procedures.

1.04 Warranty

A. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for the lesser of one (1) year from the date of installation of eighteen (18) months from the date of purchase.

Part 2. Products

2.01 Circuit Breaker: Each circuit breaker shall consist of the following

A. A molded case breaker with an over center toggle-type mechanism, providing quick-make, quick-break action. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Circuit breakers shall have variable magnetic trip elements which are set by a single adjustment to assure uniform tripping characteristics in each pole.

B. Breaker shall be calibrated for operation in an ambient temperature of 40°C.

C. Each circuit breaker shall have trip indication by handle position and shall be trip-free.

D. Three pole breakers shall be common trip.

E. The circuit breakers shall be constructed to accommodate the supply connection at either end of the circuit breaker. Circuit breaker shall be suitable for mounting and operation in any position.

F. Breakers shall be rated as shown on Drawings.

G. Series rating of circuit breakers shall not be allowed unless specifically noted on drawings. Breakers shall be UL listed. Circuit breakers shall have removable lugs.

H. Lugs shall be UL listed for copper and aluminum conductors.

I. Breakers shall be UL listed for installation of mechanical screw type lugs.

J. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other motor loads shall be motor rated.

K. Breakers indicated as “current limiting “ (CL), shall be of the non-fused type; Square D I-Limiter, Cutler Hammer Limit-R, or ITE Sentron only.

Part 3. Execution

3.01 Mounting

A. The highest breaker operating handle shall not be higher than 72 inches above the floor.

End of Section

Section 16 50 00

Lighting

Part 1. General

1.01 Description of Work:

A. The work of this section consists of providing a lighting system complete, including fixtures, lamps, hangers, reflectors, glassware, lenses, auxiliary equipment, ballasts and sockets.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section:

1. 16 10 00 General Electrical Requirements.

2. 16 11 00 Conduit, Raceway and Fittings.

3. 16 12 00 Low Voltage Wire and Cable.

4. 16 13 00 Junction and Pull Boxes.

1.03 Submittals: In accordance with the General Conditions.

A. Submit descriptive data, photometric curves for each fixture configuration proposed.

B. Submit shop drawings showing proposed methods for mounting lighting fixtures.

C. Seismic Requirements: Submit:

1. Sketch or description of the anchorage system.

D. Submit Operation and Maintenance Data per the General Conditions.

1.04 Warranty: High Intensity Discharge lamps which fail within the first year after final acceptance shall be replaced by the Contractor with the warranty clause of the General Provisions.

Part 2. Products

2.01 Fixtures

A. Fixtures shall be of the types, wattage's and voltages shown on the Drawings and be UL classified and labeled for the intended use.

B. Substitutions will not be considered unless the photometric distribution curve indicates the proposed fixture is equal to or exceeds the specified luminaire.

C. Luminaire wire, and the current carrying capacity thereof shall be in accordance with the CEC.

D. Luminaires and lighting equipment shall be delivered to the project site complete, with suspension accessories, aircraft cable, stems, canopies, hickeys, castings, sockets, holders, ballasts, diffusers, frames, and related items, including support and braces.

2.02 Ballasts:

A. Ballasts shall be of the types shown on the drawings. Ballasts shall be CBM certified and bear the UL label. Magnetic ballasts shall be the high power factor type. Electronic ballasts shall be suitable for lamps specified by Advance, Magnatek/Universal,Triad or approved equal. Electronic ballast shall be CBM certified and have 15% total harmonic distortion or less..

B. All ballasts for fixtures installed outdoors shall provide reliable starting of lamps at 0°F at 90% of the nominal line voltage.

C. Ballasts producing excessive noise (above 36 dB) or vibration will be rejected and shall be replaced at no expense to the Owner.

2.03 Lamps:

A. Lamps shall be new at the time of acceptance and shall be General Electric, Osram /Sylvania, Phillips, or approved equal.

B. Unless otherwise noted on the drawings, lamps shall be T8, 3500°K, and 85 CRI minimum.

2.04 LED:

A. LEDs shall be new at the time of acceptance and shall be Cree, Samsung, Phillips or approved equal.

B. Unless otherwise noted on the drawings, lamps shall be 3500°K, and 85 CRI minimum.

C. Drivers shall be 0-10V dimming drivers compatible with the LED system.

Part 3. Execution

3.01 Installation:

A. General:

1. All fixtures and luminaires shall be clean and lamps shall be operable at the time of acceptance.
2. Install luminaires in accordance with manufacturer's instructions, complete with lamps, ready for operation as indicated.
3. Align, mount, and level the luminaires uniformly.
4. Avoid interference with and provide clearance for equipment. Where an indicated position conflicts with equipment locations, change the location of the luminaire by the minimum distance necessary.

B. Mounting and Supports:

1. Mounting heights shall be as shown on the Drawings. Unless otherwise shown, mounting height shall be measured to the centerline of the outlet box for wall mounted fixtures and to the bottom of the fixture for suspended fixtures and to the bottom of the fixture for all other types.

2. Luminaire supports shall be anchored to structural members.
3. Pendant luminaires shall be provided with ball aligners to assure a plumb installation and shall have a minimum 25 degree clean swing from horizontal in all directions. Sway bracing shall be installed as required to limit the movement of the fixture. Fixtures shall be allowed to sway a maximum of 45º without striking any object.
4. Fixture supports shall be designed to resist earthquake forces of seismic zone 4.
5. Refer to fixture mounting details on drawings for installation requirements.

C. Pendant Fixture Mounting: Provide flexible fixture hangers unless otherwise noted on Drawings.

End of Section

This page intentionally left blank

Section 31 10 00

Site Clearing

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Protecting existing trees and vegetation to remain.

2. Removing trees and other vegetation.

3. Clearing and grubbing.

4. Topsoil stripping.

5. Removing above-grade site improvements.

6. Disconnecting, capping or sealing, and abandoning site utilities in place.

7. Disconnecting, capping or sealing, and removing site utilities.

B. Related Sections include the following:

1. The General Conditions for verifying utility locations and for recording field measurements.

2. The General Conditions Section for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.

3. Division 2 for partial demolition of buildings or fences and structures undergoing alterations.

4. Division 2 for protecting trees remaining on-site that are affected by site operations.

5. Division 3 for soil materials, excavating, backfilling, and site grading.

6. Division for finish grading, including placing and preparing topsoil for lawns and planting.

1.2 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of weeds, roots, and other deleterious materials.

1.3 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.4 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings according to the General Conditions Section "Contract Closeout."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site to comply with requirements in the General Conditions Section "Project Meetings."

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

C. Notify utility locator service for area where Project is located before site clearing.
D.

PART 2 - EXECUTION

2.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

2.2 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.

2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.

2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3. Coat cut faces of roots more than 1-1/2 inches (38 mm) in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.

4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.

2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

2.3 UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.

2. Arrange to shut off indicated utilities with utility companies.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.

D. Excavate for and remove underground utilities indicated to be removed.

2.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade.

4. Use only hand methods for grubbing within drip line of remaining trees.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

2.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).

2. Do not stockpile topsoil within drip line of remaining trees.

3. Dispose of excess topsoil as specified for waste material disposal.

4. Stockpile surplus topsoil and allow for re-spreading deeper topsoil.

2.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

2.7 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

End of Section

SECTION 31 20 00

Earthmoving

PART 1 – GENERAL

1.1 SUMMARY

A. In accordance with pertinent provisions of this Section, excavate, backfill, compact, and grade the site to the elevations shown on the Drawings and as needed to meet the requirements of the construction shown in the Contract Documents.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the soils engineer.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of General Conditions.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Fill and backfill materials:

1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6” in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8” in their greatest dimension.

2. Fill material is subject to the approval of the construction soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular non-expansive soils, free from roots and other deleterious matter.

3. Do not permit rocks having a dimension greater than 1” in the upper 12” of fill or embankment.

4. Cohesionless material used for structural backfill:

   a. Provide sand free from organic material and other foreign matter, and as approved by the construction soil engineer.

2.2 WEED KILLER

A. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this Work by governmental agencies having jurisdiction.

2.3 TOPSOIL

A. Where and if shown on the Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoils, roots, heavy or stiff clay, stones larger than 2" in greatest dimension, noxious weeds, sticks, brush, litter, and other deleterious matter.

B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 CLEARING, GRUBBING, AND PREPARING AREAS TO BE FILLED

A. All vegetable matter, trees, root systems, shrubs, debris, and organic topsoil shall be removed from all structural areas and areas to receive fill to a minimum depth of 4".

3.3 PROCEDURES

A. Utilities:

1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.

2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.

3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.

5. Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of this Work, and post warning lights on property adjacent to or with public access.

2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. De-watering:

1. Remove all water, including rainwater, encountered during trench and substructure work to an approved location by pumps, drains, and other approved methods.

2. Keep excavations and site construction area free from water.

D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Maintain access to adjacent areas at all times.

3.4 EXCAVATING

A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.

B. Satisfactory excavated materials:

1. Transport to, and place in, fill or embankment areas within the limits of the Work.

C. Unsatisfactory excavated materials:

1. Excavate to a distance below grade as directed by the construction soil engineer, and replace with satisfactory materials.

2. Include excavation of unsatisfactory materials, and replacement by satisfactory materials, as parts of the work of this Section.

D. Surplus materials:

1. Dispose of unsatisfactory excavated materials, and surplus satisfactory excavated material, away from the site at disposal areas arranged and paid for by the Contractor.

E. Excavation of rock:

1. Where rocks, boulders, granite, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, take required steps to proceed with the general EARTH MOVING operations of the Work, and remove or excavate such material by means which will neither cause additional cost to the Owner nor endanger buildings or structures whether on or off the site.

F. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

G. Ditches and gutters:

1. Cut accurately to the cross sections, grades, and elevations shown.

2. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the Work.

3. Dispose of excavated materials as shown on the Drawings or directed by the construction soil engineer; except do not, in any case, deposit materials less than 3’-0” from the edge of a ditch.

H. Unauthorized excavation:

1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Architect or the construction soil engineer.

2. Under footings, foundations, or retaining walls:

a. Fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.

b. When acceptable to the construction soil engineer, lean concrete fill may be used to bring bottom elevations to proper position.

3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the construction soil engineer.

I. Stability of excavations:

1. Slope sides of excavation to 1:1 or flatter, unless otherwise directed by the construction soil engineer.

2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.

3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

J. Shoring and bracing:

1. Provide materials for shoring and bracing as may be necessary for safety or personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.

2. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.

3. Carry shoring and bracing down as excavation progresses.

3.5 FILLING AND BACKFILLING

A. Backfill excavations as promptly as progress of the Work permits, but not until:

1. Acceptance of construction below finish grade.

2. Inspecting, testing, approving, and recording locations of underground utilities.

3. Concrete formwork is removed.

4. Shoring and bracing are removed, and voids have been backfilled with satisfactory materials.

5. Trash and debris have been removed.

6. Horizontal bracing is in place on horizontally supported walls.

B. Ground surface preparation:

1. See soils report for over excavation and re-compaction requirements.

2. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from the ground surface prior to placement of fills.

3. Plow, strip, or break up surfaces steeper than one vertical to four horizontal, so that fill material will bond with existing surface.

4. When existing ground surface has a density less than that specified under “compacting” for the particular area, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

5. At exposed soils in areas to be paved or to support slab-on-grade, scarify to a minimum depth of 6”, and re-compact at a moisture content that will permit proper compaction as specified for fill.

C. Placing and compacting:

1. Place backfill and fill materials in layers not more than 8” in loose depth.

2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.

3. Compact each layer to required percentage of maximum density for the area.

4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.

5. Place backfill and fill materials evenly adjacent to structures, to required elevations.

6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structures to approximately the same elevation in each lift.

3.6 EARTH MOVING

A. General:

1. Uniformly grade the areas within limits of EARTH MOVING under this Section, including adjacent transition areas.

2. Smooth the finished surfaces within specified tolerance.

3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.

4. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8’-0”, unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

B. EARTH MOVING outside building lines:

1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.

2. Finish the surfaces to be free from irregular surface changes, and:

a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 feet above or below the required subgrade elevation.

b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 feet above or below the required subgrade elevation.

3.7 COMPACTING

A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557. See soils report.

B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place, and as approved by the construction soil engineer:

1. Structures:

a. Compact the top 8” of subgrade and each layer of fill material or backfill material at 90% of maximum density.

2. Lawn and unpaved areas:

a. Compact the top 8” of subgrade and each layer of fill material or backfill material at 90% of maximum density;

b. Compact the upper 12” of filled areas, or natural soils exposed by excavating, at 85% of maximum density.

3. Walks:

a. Compact the top 6” subgrade and each layer of fill material or backfill material at 90% of maximum density.

4. Pavements and slabs-on-grade:

a. Compact the top 6” of subgrade and each layer of fill material or backfill material at 95% of maximum density.

C. Moisture control:

1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.

2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.

3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture density relation tests approved by the construction soil engineer.

3.8 FIELD QUALITY CONTROL

A. Secure the construction soil engineer's inspection and approval of subgrades and fill layers before subsequent construction is permitted thereon.

3.9 MAINTENANCE

A. Protection of newly graded areas:

1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds;

2. Repair and re-establish grades in settled, eroded, and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

End Of Section

SECTION 31 23 33

Trenching & Backfilling

PART 1 - GENERAL

1.1 RELATED WORK

A. Division 31: Grading.

1.2 SUMMARY

A. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the construction soil engineer.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Fill and backfill materials:

1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 3" in greatest dimension, and with not more than 10% of the rocks or lumps larger than 1" in their greatest dimension.
2. Fill material is subject to the approval of the construction soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non- expansive soil free from roots and other deleterious matter.
3. Imported fill material shall, in addition, have 10 to 40% by weight passing the #200 sieve, a plasticity index of less than 15, and a liquid limit of less than 30%.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. Comply with documents.

3.3 PROCEDURES

A. Utilities:

1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.

2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.

3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.

5. Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.

2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. De-watering:

D.

1. Remove all water, including rainwater; encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.

2. Keep trenches and site construction area free from water.

D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Maintain access to adjacent areas at all times.

3.4 TRENCHING

A. Provide sheeting and shoring necessary for protection of the Work and for the safety of personnel.

1. Prior to backfilling, remove all sheeting.

2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Architect, field conditions or the type of sheeting or methods of construction such as use of concrete bedding are such as to make removal of sheeting impracticable. In such cases, the Architect may permit portions of sheeting to be cut off and remain in the trench.

B. Open cut:

1. Excavate for utilities by open cut.

2. If conditions at the site prevent such open cut, and if approved by the Architect, trenching may be used.

3. Short sections of a trench may be tunneled if, in the opinion of the Architect, the conductor can be installed safely and backfill can be compacted properly into such tunnel.

4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the construction soil engineer.

5. When the void is below the subgrade for the utility bedding, use approved earth materials and compact to the relative density directed by the construction soil engineer, but in no case to a relative density less than 90%.

6. When the void is in the side of the utility trench or open cut, use approved earth or sand compacted as approved by the construction soil engineer, but in no case to a relative density less than 85%.

7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.

8. Excavating for appurtenances:

   a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.

   b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the construction soil engineer, and at no additional cost to the Owner.

C. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.

D. Depressions:

1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.

2. Except where rock is encountered, do not excavate below the depth indicated or specified.

3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified.

E. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, over, and other requirements as set forth by legally constituted authority having jurisdiction, but in no case less than the depth shown in the Contract Documents.

F. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.

G. Cover:

1. Provide minimum trench depth indicated below to maintain a minimum cover over the top of the installed item below the finish grade or subgrade:

   a. Areas subject to vehicular traffic:
      (1) Sanitary sewers: 24";
      (2) Storm drains: 24".

   b. Areas not subject to vehicular traffic:
      (1) Sanitary sewers: 18";
      (2) Storm drains: 18".

   c. All areas:
      (1) Water lines: 18";
      (2) Natural gas lines: 18";

(3) Electrical cables: 24";
(4) Electrical ducts: 18".

d. Concrete encased:
(1) Pipe sleeves for water and gas lines: 18";
(2) Sanitary sewers and storm drains: 12";
(3) Electrical ducts: 18".

2. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve, and electrical long-radius rigid metal conduit riser, provided it will not interfere with the structural integrity of the slab or pavement.

3. Where the minimum cover is not provided, encase the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2500 psi.

3.5 BEDDING

A. Provide bedding as indicated on the Drawings.

3.6 BACKFILLING

A. General:

1. Do not completely backfill trenches until required pressure and leakage tests have been performed, and until the utilities systems as installed conform to the requirements specified in the pertinent Sections of these Specifications.

2. Except as otherwise specified or directed for special conditions, backfill trenches to the ground surface with selected material approved by the construction soil engineer.

3. Reopen trenches that have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the construction soil engineer.

4. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests, and approvals.

5. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, refill and compact as specified, all at no additional cost to the Owner.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to 90% relative density (85% in landscape areas), until there is a cover of not less than 24" over sewers and 12" over other utility lines.

2. Take special care in backfilling and bedding operations to not damage pipe and pipe coatings.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with approved backfill.

2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density indicated by the construction soil engineer.

D. Adjacent to buildings: Mechanically compact backfill within ten feet of buildings.

E. Consolidation of backfill by jetting with water may be permitted, when specifically approved by the construction soil engineer, in areas other than building and pavement areas.

3.7 TEST FOR DISPLACEMENT OF SEWERS AND STORM DRAINS

A. Check sewers and storm drains to determine whether displacement has occurred after the trench has been backfilled to above the pipe and has been compacted as specified.

B. Flash a light between manholes or, if the manholes have not yet been constructed, between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror.

C. If the illuminated interior of the pipeline shows poor alignment, displaced pipes, or any other defects, correct the defects to the specified conditions and at no additional cost to the Owner.

3.8 PIPE JACKING

A. The Contractor may, at his option, install steel pipe casings, tongue-and-groove reinforced concrete pipes, and steel pipes under existing roads or pavements by jacking into place using procedures approved by the governmental agencies having jurisdiction and approved by the construction soil engineer.

3.9 TUNNELING OPERATIONS

A. The Contractor may, at his option, tunnel pipes into position using procedures approved by the construction soil engineer and the governmental agencies having jurisdiction.

3.10 FIELD QUALITY CONTROL

A. The construction soil engineer will inspect open cuts and trenches before installation of utilities, and will make the following tests:

1. Assure that trenches are not backfilled until all tests have been completed;

2. Check backfilling for proper layer thickness and compaction;

3. Verify that test results conform to the specified requirements, and that sufficient tests are performed;

4. Assure that defective work is removed and properly replaced.

End Of Section

This page intentionally left blank

Section 32 12 16

Asphalt Paving

PART 1 GENERAL

1.01 SUMMARY

A. Provide asphaltic concrete paving where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 SUBMITTALS

A. Comply with pertinent provisions of these Sections.

B. Product data: Within 30 calendar days after the Contractor has received the Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section;
   2. Certificates, signed by the materials producer and the asphalt-paving subcontractor, stating that materials meet or exceed the specified requirements.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of these Sections.

PART 2 PRODUCTS

2.01 AGGREGATES

A. Provide aggregates consisting of crushed stone, gravel, sand, or other sound, durable, mineral materials processed and blended, and naturally combined.

B. Base rock shall conform to Caltrans Class 2 Aggregate Base.

C. Base aggregate maximum size: Reference Lowney Associates, Report No. 1481-1, dated August 27, 1999.

D. Asphalt Concrete shall be Type B and shall conform to Section 39 of the Standard Specifications and these Special Provisions:
   1. The viscosity grade of paving asphalt shall be AR-4000.
   2. In no case shall the minimum asphalt content be below 5.3% of the dry aggregate weight.

3. All surface courses of asphalt concrete shall be 1/2” maximum aggregate, and a minimum of 5.8% asphalt.

2.02 WEED KILLER

A. Provide a dry, free-flowing, dust-free chemical compound containing not less than 30% sodium chlorate or a chlorateborate compound, non-flammable, not creating a fire hazard when applied in accordance with the manufacturer's recommendations, soluble in water, and capable of being spread dry or in solution.

B. Acceptable products:
1. "Clorax 40": Chipman Chemical Company, Inc., Palo Alto, California
2. "Monobar-Chlorate": U.S. Borax and Chemical Corp., Los Angeles, California

2.03 HEADERS AND STAKES

A. Provide Redwood, Construction grade, in dimensions shown on the Drawings or as required for the use where dimensions are not shown on the Drawings.

2.04 ASPHALTS

A. Asphalt Concrete shall be Type B and shall conform to Section 39 of the Standard Specifications and these Special Provisions:
1. The viscosity grade of paving asphalt shall be AR-4000.
2. In no case shall the minimum asphalt content be below 5.3% of the dry aggregate weight.
3. All surface courses of asphalt concrete shall be 1/2” maximum aggregate, and a minimum of 5.8% asphalt.

2.05 SLURRY COAT

A. Poly-Kote TA-1000 is a special blend of asphalt emulsion, mineral fillers, fiber, and polymer for use on parking lots, driveways, playgrounds, tennis courts, and other asphalt surfaces. Poly-Kote TA-1000 is formulated to fill voids, provide a smoother black surface, and protect asphalt surfaces from possible water damage. Contractor shall apply a slurry coat on new and existing AC pavemen

PHYSICAL PROPERTIES (NO ASBESTOS OR COAL TAR)

Color (cured film).....Deep Black
Penetration of base asphalt.....40 pen. Max. ASTM D-5
Residue at 300-400 degrees f.....55-65 %
Cone Penetration at 77 degrees f.....400-750 dmm ASTM D-217
Density;lbs.per gallon at 60 degreesf.....10-11

B. TA-200 is a specially blended acrylic copolymer emulsion, designed to modify Poly-Kote TA 1000 asphalt base. TA-200 will increase toughness/flexibility, and enhance suspen-

sion of fillers. Its also improves color, oil/gas resistance, and will protect from "DAMAGING" ultra-violet rays; when added to POLY-KOTE TA 1000.

PHYSICAL PROPERTIES	Minimum	Maximum
LBS. Per Gallon @ 77 Degrees f	8.5	8.9
Specific Gravity @ 77 Degrees f	1.0	1.2
% Nonvolatile	49%	51%

2.06 MIXING ASPHALTIC CONCRETE MATERIALS

A. Provide hot plant mixed asphaltic concrete paving materials.
1. Temperature leaving the plant: 290 degrees F minimum, 320 degrees F maximum.
2. Temperature at time of placing: 280 degrees F minimum.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FINAL PREPARATION OF SUBGRADES

A. After preparation of subgrade as specified in another Section of these Specifications, scarify and moisture condition the entire area to be paved to a depth of 8 inches, and then compact to a smooth, hard, even surface of 95% compaction to receive the aggregates.

B. Apply the specified week killer to the entire area to be paved. Adhere to the manufacturer's application recommendations.

3.03 PLACEMENT OF BASE COURSES

A. Sub-base (when required):
1. Spread the specified sub-base material to a thickness providing the compacted thickness shown on the Drawings.
2. Compact to 95%.

B. Base:
1. Spread the specified base material to a thickness providing the compacted thickness shown on the Drawings. No single lift shall exceed 8" in loose thickness prior to compaction.

2. Compact to 95% at near optimum moisture content.

C. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".

D. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in ten feet.
1. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.

E. Moisture content: Use only the amount of moisture needed to achieve the specified compaction.

3.04 PLACEMENT OF ASPHALTIC CONCRETE PAVING

A. Install the specified headers and stakes to achieve the arrangement of paving shown on the Drawings.

B. Remove all loose materials from the compacted base.

C. Apply the specified prime coat and tack coat where required and allow to dry, in accordance with the manufacturer's recommendations as approved by the Engineer.

D. Adjust frames and covers, if so required, to meet final grades.

E. Receipt of asphaltic concrete materials:
1. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 280 degrees F.

2. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 50 degrees F, nor during fog, rain, or other unsuitable conditions.

F. Spreading:
1. Spread material in a manner that requires the least handling.

2. Where thickness of finished paving will be 3" or less, spread in one layer.

G. Rolling:
1. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.
2. Roll in at least two directions until no roller marks are visible.
3. Finished paving smoothness tolerance:
   a. Free from birdbaths.
   b. No deviations greater than 1/8" in six feet.

3.05 FLOOD TEST

A. Prior to application of seal coat, perform a flood test in the presence of the Engineer.

B. Method:

1. Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.

2. If a depression is found where water ponds to a depth of more than 1/8" in six feet, feather and smooth the edges of fill so that the joint between fill and original surface is invisible and retest. Continue until ponding is eliminated.

3.06 APPLICATION OF SLURRY COAT

A. Prepare the surfaces, mix the seal coat material, and apply in accordance with the manufacturer's recommendations as approved by the Engineer.

B. Apply slurry coat as specified above, 2.05.

C. Achieve a finished surface of slurry coat which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

3.07 PROTECTION

A. Protect the asphaltic concrete paved areas from traffic until the sealer is set and cured and does not pick up under foot or wheeled traffic.

End of Section

This page intentionally left blank

SECTION 32 13 12

Concrete Paving

PART 1 - GENERAL

1.1 SUMMARY

A. Provide Portland cement concrete paving where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Do not commence placement of concrete until mix designs have been reviewed and approved by the Architect and all governmental agencies having jurisdiction, and until copies of the approved mix designs are at the job site and the batch plant.

C. Provide access for, and cooperate with, the inspector and testing laboratory described in General Requirements.

PART 2 - PRODUCTS

2.1 FORMS

A. Provide wood or metal formwork, including adequate bracing, to the lines and grades shown on the Drawings within a vertical tolerance of 0.05 feet and an alignment tolerance of 1" at any point.

B. Earth forms will not be permitted for paving.

2.2 REINFORCEMENT

A. Comply with the following as minimums:

1. Bars: ASTM A615, grade 60, unless otherwise shown on the Drawings, using deformed bars for number 3 and larger.
2. Welded wire fabric: ASTM A185
3. Bending: ACI 318.

B. Fabricate reinforcement to the required shapes and dimensions, with fabrication tolerances complying with the CRSI "Manual of Standard Practices."

C. Do not use reinforcement having any of the following defects:

1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances;

2. Bends or kinks not indicated on the Drawings or required for the Work;

3. Bars with cross-section reduced due to excessive rust or other causes.

2.3 CONCRETE

A. Comply with the following as minimums:

1. Portland cement: ASTM C150, type I or II, low alkali.

2. Aggregate, general:

a. ASTM C30, uniformly graded and clean;

b. Do not use aggregate known to cause excessive shrinkage.

3. Aggregate, coarse: Crushed rock or washed gravel with maximum size between 3/4" and 1-1/2", and with minimum size number 4.

4. Aggregate, fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8" screen, of which at least 12% shall pass a 50-mesh screen.

5. Water: Clean and potable.

B. Use only such additives as are recommended in the mix design and approved by the Architect and governmental agencies having jurisdiction.

C. Unless specified otherwise on the drawings, all concrete shall be not less than 3,000 psi 28-day compressive strength.

D. Provide "Hunt TLF" curing agent manufactured by Hunt Process Co., Inc., at the manufacturer's recommended rate of application.

2.4 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINAL PREPARATION OF SUBGRADES

A. After preparation of subgrade as specified in another Section of these Specifications, thoroughly scarify and sprinkle the entire area to be paved, and then compact to a smooth, hard, even surface of 95% compaction to receive the aggregates.

3.3 PLACEMENT OF BASE COURSE

A. Base (where required):

1. Spread the specified coarse aggregate to a thickness providing the compacted thickness shown on the Drawings. No single lift shall exceed 8" in loose thickness prior to compaction.

2. Compact to 95% at near optimum moisture content.

B. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".

C. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 0.05 feet vertically and 1" in alignment at any point.

D. Correct deviations by removing materials, replacing with new materials, and reworking or recompacting as required.

E. Use only the amount of moisture needed to achieve the specified compaction.

3.4 INSTALLATION

A. Upon completion of base course and formwork, install reinforcement as shown on the Drawings.

1. Clean reinforcement to remove loose rust and mill scale, earth, and other materials that reduce bond or destroy bond with concrete.

2. Position, support, and secure reinforcement against displacement by formwork, construction, and concrete placement operations.

3. Place reinforcement to obtain the required coverages for concrete protection.

B. Transit mix the concrete in accordance with provisions of ASTM C94.

1. With each load, provide ticket certifying to the materials and quantities and to compliance with the approved mix design.

2. On the transit-mix ticket, state the time water was first added to the mix.

3. At the batch plant, withhold 2-1/2 gal of water per cu yd of concrete.

4. Upon arrival at the job site, and as directed by the testing laboratory inspector, add all or part of the withheld water before the concrete is discharged from the mixer.

5. Mix not less than five minutes after the withheld water has been added, and not less than one minute of that time immediately prior to discharge of the batch.

6. Unless otherwise directed, provide 15 minutes total mixing time per batch after first addition of water.

C. Do not use concrete that has stood over 30 minutes after leaving the mixer, or concrete that is not placed within 90 minutes after water is introduced into the mix.

D. Conveying:

1. Place concrete in accordance with the following and pertinent recommendations contained in ACI 304.

2. Deposit concrete continuously in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section.

3. If a section cannot be placed continuously, provide construction joints as specified herein.

4. Perform concrete placing at such a rate that concrete that is being integrated with fresh concrete is still plastic.

5. Deposit concrete as nearly as practicable in its final location so as to avoid segregation due to rehandling and flowing.

6. Do not subject concrete to any procedure that will cause segregation.

7. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.

8. Remove rejected concrete from the site.

E. Deposit and consolidate concrete in a continuous operation within the limits of construction joints until the placing of a panel or section is completed.

1. Bring surfaces to the correct level with a straightedge, and then strike off.

2. Use bullfloats or darbies to smooth the surface, leaving it free from bumps and hollows.

3. Do not sprinkle water on the plastic surface. Do not disturb the surfaces prior to start of finishing operations.

F. Expansion joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

1. Extend joint fillers full-width and depth of joint, and not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.

2. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.

3. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

G. Finishing:

1. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.

2. During or after the first floating, check the planeness of surface with a ten-foot straightedge applied at not less than two different angles.

3. Cut down high spots and fill low spots, and produce a surface level within 1/4" in two feet as determined by a two foot straightedge placed anywhere on the surface in any direction.

4. Refloat the surface immediately to a uniform sandy texture.

5. While the surface is still plastic, provide a textured finish by drawing a fiber bristle broom uniformly over the surface.

   a. Unless otherwise directed by the Architect, provide the texturing in one direction only.

   b. Provide medium broom finish at slopes less then 6% and heavy broom finish at slopes greater or equal then 6% as directed by the Architect.

3.5 INTEGRAL COLOR IN CONCRETE

A. Integral colored concrete to be used in locations shown on drawings.

B. Water-reducing, set-controlling admixture; Chromix Admixture, L.M. Scofield Co., Los Angeles, CA, or approved equal.

C. Integral color shall be added as recommended by manufacturer to produce accepted color.

D. Color as shown on drawings: To be selected from manufacturer's standard or custom colors, as accepted.

3.6 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.

End of Section

SECTION 33 41 00

Storm Utility Drainage Piping

PART 1 - GENERAL

1.1 SUMMARY

A. Provide storm sewerage system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.2 SUBMITTALS

A. Comply with pertinent provisions of General Conditions.

B. Product data: Within 20 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

A. Provide pipe and associated materials of the size indicated on the Drawings and meeting the following requirements.

1. Non-reinforced concrete pipe (NRCP): Provide "extra strength" complying with ASTM C14.

2. Reinforced concrete pipe (RCP): Provide "standard strength" (Class III) complying with ASTM C76.

3. Polyvinyl chloride pipe (PVC): Drainpipe shall conform to requirements for ASTM D3034, for SDR-35.

4. Trench Drains: ABT Inc. "Polydrain" precast polymer concrete trench drain system and components, including catch basins with locking devices.

2.2 DRAINAGE STRUCTURES

A. General:

1. Construct manholes, inlets, and junction structures of reinforced concrete or pre-cast reinforced concrete, complete with metal frames and covers or gratings, and with fixed ladder rungs where indicated on the Drawings or required by codes.

2. Individual wall-mounted aluminum, plastic-covered steel, or galvanized steel rungs are acceptable.

B. Materials:

1. Concrete: Comply with provisions for a minimum of 2500-psi concrete specified in Section 033001.

2. Mortar for pipe joints and connections to other drainage structures, and manhole construction:

a. Comply with requirements of ASTM C270, type M, except the maximum placement time shall be one hour.

b. Hydrated lime complying with ASTM C141, type B, may be added to the mixture of sand and cement in an amount equal to 25% of the volume of cement used.

c. Provide a quantity of water in the mixture sufficient to produce a stiff workable mortar, which shall be clean and free from harmful acids, alkalis, and organic impurities. Use the mortar within 30 minutes after water is added to the mix.

3. Precast reinforced concrete manholes:

a. Comply with ASTM C478, precast rings and cone sections.

b. Fully bed the joints between precast concrete risers and tops in mortar, and smooth both interior and exterior surfaces uniformly.

c. Acceptable products:
(1) Manufactured by Ameron Pipe Products Group, El Monte, California.

4. Reinforcement: Provide intermediate grade billet steel complying with ASTM A615, grade 40.

5. Frames and covers or gratings:

   a. Provide all gratings or covers from the same manufacturer.

   b. Provide standard black finish, supplied as a total unit, sized as shown on the Drawings or larger sizes except where in a pavement area, and with the wording "STORM DRAIN" cast into the cover.

   c. Acceptable products:
      (1) Manufactured by Alhambra Foundry, Alhambra, California.
      (2) Manufactured by NEENAH Foundry Company, Neenah, Wisconsin.

6. Precast concrete catch basins:

   a. Provide reinforced and bottom open for field pouring to ensure slope through the structure.

   b. Contractor may select this option in lieu of cast-in-place concrete catch basins.

   c. Precast concrete, Christy Products "U" Series.

   d. All products shall conform to ADA standards.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 EXCAVATING, TRENCHING, AND BEDDING

A. Excavate, trench, and bed for site drains in accordance with pertinent provisions of Section 312333, and the following.

B. Movement of construction machinery:

   1. Use means necessary to avoid displacement of, and injury to, pipe and structures while compacting by rolling or operating equipment parallel to the pipe.

   2. Movement of construction machinery over a culvert or storm drain at any stage of construction is solely at the Contractor's risk.

C. Bedding:

1. Provide a bedding surface for the pipe with a firm foundation of uniform density throughout the entire length of the pipe.
2. Bed the pipe carefully in a soil foundation accurately shaped and rounded to conform to the lower 1/4 of the outside perimeter of circular pipe, or set the pipe in a bed of sand.
3. Tamp bedding where necessary.
4. Provide bell holes and depressions for pipe joints of only the length, depth, and width required for making the particular pipe joint properly.
5. Where plastic pipe is used, provide a minimum of 4" of sand bedding over the top and under the pipe.

3.3 INSTALLING PIPE

A. General:

1. Carefully examine each pipe prior to placing.
   a. Promptly set aside defective pipe and damaged pipe.
   b. Clearly identify defects.
   c. Do not install defective pipe or damaged pipe.
2. Place pipe to the grades and alignment indicated, with a tolerance of one in 1000 vertical and one in 500 horizontal, unless otherwise directed by the Architect.
3. Provide adequate facilities for lowering pipe safely into the trenches.
4. Do not place pipe in water, or place pipe when trench or weather is unsuitable for such work.

B. Concrete pipe: Place by proceeding upgrade with the tongue ends of tongue and groove pipe, pointing in the direction of flow.

3.4 JOINTS

A. Joining concrete pipe:

1. Use the specified mortar ingredients.
2. Use the mortar within 60 minutes from the time water is first added to the mix.
3. Wipe the inside of the joint clean and smooth. Perform wiping by dragging a suitable swab or long handled brush through the pipe as installation progresses.

4. Protect the mortar bead on the outside from air and sun with suitable covering until cured.
5. Unless otherwise directed by the Architect, use one of the following methods of jointing for tongue and groove pipe:

    a. Cement mortar tongue and groove joint:
        (1) Bed the first pipe to the established gradeline, with the groove end placed upstream.
        (2) Clean surface of groove with wet brush, and fill lower portion with mortar to such depth as to bring the inner surfaces of the abutting pipes flush and even.
        (3) Clean the tongue end of each subsequent pipe with a wet brush, and uniformly match the groove so that the sections are closely fitted.
        (4) After laying each section, fill remainder of joint with mortar, and form a bead around the outside of the joint with mortar.
        (5) Use the specified mortar. If mortar can slump before setting, wrap or bandage the outside of the joint with cheesecloth to retain mortar in place.

    b. Flexible watertight joints:
        (1) Use the specified materials. Equal materials may be used when specifically approved in advance by the Architect.
        (2) Install gaskets and joint materials in accordance with the manufacturers' recommendations as approved by the Architect.
        (3) Protect from sun, blowing dust, and other deleterious agents at all times.
        (4) Align the pipe with previously installed pipe, and pull the joint together. If, while making the joint, the gasket or jointing material becomes loose and can be seen through exterior joint recess when joint is pulled to within 1" of closure, remove pipe and remake the joint.
        (5) Inspect gaskets, and replace loose and improperly affixed gaskets and jointing materials.

B. Polyvinyl chloride pipe joints: Install with the specified materials and in accordance with the manufacturers' recommendations as approved by the Architect, applying solvent cement to pipe and fitting as recommended in ASTM D2564.

C. Joining pipe of different materials: Provide fittings or couplings made for the pipe material jointing, or provide a concrete collar as approved by the Architect.

D. Joining pipe of different sizes:

    1. Provide reducer fittings to the larger pipe.

    2. Where pipes are different materials as well as different sizes, use the same material for reducer fitting as in the larger pipe.

3. Use saddle connection when branch lines join a main or collector main.

4. Use eccentric collar joint when the slope of the pipe is less than 1%.

3.5 DRAINAGE STRUCTURES

A. Install drainage structures in accordance with the Drawings and with the manufacturers' recommendations as approved by the Architect.

3.6 BACKFILLING

A. Backfill and compact in accordance with pertinent provisions of Section 312333.

3.7 TESTING AND INSPECTING

A. Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.

B. Hydrostatic test on watertight joints:

1. Make a hydrostatic test on each watertight joint. Test one sample of each type watertight joint used. If one sample fails because of faulty workmanship, test an additional joint.

2. Demonstrate that joints in reinforced and unreinforced concrete pipe comply with ASTM C443.

3. Make tests in concrete pipe at an internal hydrostatic pressure of 10 psi for 24 hours.

4. Only joints within ten feet of exterior walls or faces of the buildings need be tested.

5. Replace or repair joints found to be faulty. Repeat the test and repair cycle until joints are demonstrated to meet the specified requirements.

End Of Section