DOCUMENT 00 0101

PROJECT MANUAL

for

TOWN CENTER SEWER PUMP STATION IMPROVEMENTS

At

2995 Woodside Road

APN No. 073-112-120

Town of Woodside
Public Works Department
2955 Woodside Road
Woodside, California 94062

Advertisement Date: October 28, 2016

Bid Date: Wednesday, December 1, 2016

10/27/16

Sean R. Rose, Town Engineer **Date**

Sindhi Melala 10/27/16

Project Manager **Date**

DOCUMENT 00 0110

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TECHNICAL SPECIFICATIONS

END OF DOCUMENT

DOCUMENT 00 1113

NOTICE INVITING BIDS

ARTICLE 1 INVITATION TO BID

1.01 Notice Inviting Bids: Owner will receive sealed Bids at the Town Clerk's Office, Town of Woodside, located at 2955 Woodside Road, Woodside, California 94062 until **2:00 PM** on **Thursday, December 1st, 2016** for the following public work:

TOWN OF WOODSIDE

TOWN CENTER SEWER PUMP STATION IMPROVEMENTS

2995 WOODSIDE ROAD

1.02 Project Description: Work includes all labor, materials, tool and equipment necessary for furnishing and installing approximately 28 LF of 6" PVC SDR26, 66 LF of 8" PVC SDR26, 24 LF of 12" PVC SDR26 gravity sanitary sewer, and 96 LF of 4" DIP sanitary sewer force main; a 26-foot deep, 72" (6') diameter precast wastewater wet well with two (2)-Flygt submersible pumps; a new System Control and Data Acquisition (SCADA) equipment; a new electrical control cabinet and a new 40kW diesel generator with sound enclosure subbase fuel tank; a 11-foot deep, 48" diameter inside sanitary sewer drop manhole with pour-in-place base, and CIM1000 lined; a timber lagging retaining wall; a new 1" copper water service line; a new asphalt concrete pavement; rehabilitating existing wetwell; and abandoning sanitary sewer mains and manholes, complete in place, including but not limited to excavation of trenches, laying pipe materials and installation of structures, backfill trenches, pavement removal and new surfacing and other pertinent work as necessary to construct the project as shown on the approved plans and specified in the project specifications. All work for Town Center Sewer Pump Station Improvements shall be completed within **100 working days**.

1.03 Procurement of Bidding Documents: Bidding Documents contain the full description of the Work. Bidders may examine a complete hard-copy set of the Bidding Documents at the Town's Public Works Department, located at **2955 Woodside Road**, **Woodside, California 94062. Bidding Documents are available on the Town's website at woodsidetown.org.**
Bidder is responsible for printing any and all of Bidding Documents.

1.04 Instructions: Bidders shall refer to Document 00 2113 (Instructions to Bidders) for required documents and items to be submitted in a sealed envelope for deposit into the Bid Box in the Town Clerk's Office, located at 2955 Woodside Road, Woodside, California 94062 no later than the time and date set forth in Paragraph 1.01 above.

1.05 Non Mandatory Pre-Bid Site Visit: Owner will conduct a Non Mandatory Pre-Bid Conference and Site Visit at 10:00 am on **Thursday, November 17th, 2016** at **Town Center Sewer Pump Station Improvements, 2995 Woodside Road, Woodside CA 94062.** The Pre-Bid Conference and Site Visit will last approximately **two** hours.

1.06 Bid Preparation Cost: Bidders are solely responsible for the cost of preparing their Bids.

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

1.08 Portion of Work to be Performed by Contractor: The successful bidder shall self-perform

no less than 51% of the Work described in the Contract Documents utilizing its own work force, excluding Specialty Items. Specialty Items will be identified in the Contract Documents.

ARTICLE 2 LEGAL REQUIREMENTS

2.01 Required Contractor's License(s): A California "A" contractor's license is required to bid this contract. Joint ventures must secure a joint venture license prior to award of this Contract.

2.02 Required Contractor and Subcontractor Registration

A. Owner shall accept Bids only from Bidders that (along with all Subcontractors listed in Document 00 4330, Subcontractor List) are currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5.

B. Subject to Labor Code Sections 1771.1(c) and (d), any Bid not complying with paragraph 2.02A above shall be returned and not considered; provided that if Bidder is a joint venture (Business & Professions Code Section 7029.1) or if federal funds are involved in the Contract (Labor Code Section 1771.1(a)), Owner may accept a non-complying Bid provided that Bidder and all listed Subcontractors are registered at the time of Contract award.

2.03 Bid Alternates:

A. N/A:
B. The determination of lowest bid shall be based upon base contract bid only.

2.04 Non-Substitutable Materials, Products, Things, or Services

A. N/A

B. Owner has made a finding that the material(s), product(s), thing(s), or service(s) identified above by specific brand or trade name are required for use in the Project and may not be substituted for "or equal" items, for the following purpose:

1. In order to match other products in use on a particular Owner project either completed or in the course of completion.

2.05 Substitution of Securities: Owner will permit the successful bidder to substitute securities for any retention monies withheld to ensure performance of the contract, as set forth in Document 00 6290 Escrow Agreement For Security Deposits In Lieu Of Retention in accordance with Section 22300 of the California Public Contract Code. If successful bidder wishes to substitute securities for any retention monies withheld to ensure performance of the contract, the successful bidder shall request from Owner and complete said Document 00 6290 prior to executing the Agreement

2.06 Prevailing Wage Laws: The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at the Town's Public Works Department, may be obtained from the California Department of Industrial Relations website [http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm] and are deemed included in the Bidding Documents. Upon request, Owner will make available copies to any interested party. Also, the successful Bidder shall post the applicable prevailing wage rates at the Site.

2.07 Prevailing Wage Monitoring: This Project is subject to prevailing wage compliance monitoring and enforcement by the Department of Industrial Relations.

END OF DOCUMENT

ACCESS, INDEMNITY AND RELEASE AGREEMENT
(If Invasive Testing is Allowed)

Dated

POTENTIAL CONTRACTOR: _____

OWNER: **TOWN OF WOODSIDE**

SITE: **Town Center – Between Mountain Home Road and Woodside Road**

PROJECT: **Town Center Sewer Pump Station Improvements**

In consideration of the above-referenced Owner's permitting the undersigned potential Contractor (**Contractor**) to have access to, and to conduct investigations, tests and/or inspections on the Site (**access**), and effective upon such access, Contractor hereby agrees as follows:

1.01 To the greatest extent permitted by law including, without limitation, California Civil Code Section 2782, Contractor hereby releases, and shall defend, indemnify, and hold harmless Owner, and its officers, employees, consultants, representatives, and agents, and all other parties having any other interest in the Site, against any claim or liability, including attorney's fees, arising from or relating to any Site-related access, investigation, test, inspection and/or other activity conducted by Contractor or any of Contractor's officers, employees, consultants, representatives, and/or agents, regardless of whether claim or liability is caused in part by the negligence of Owner or by any released and indemnified party.

1.02 Contractor hereby waives the provisions of California Civil Code Section 1542, which provides as follows:

> A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor.

1.03 Contractor shall repair any damage to the Site or adjacent property resulting from activities authorized hereunder, and comply with and be subject to all other requirements and obligations described or referenced in Document 00 3132 (Geotechnical Data and Existing Conditions).

1.04 Attached hereto (or to be delivered separately before Contractor's visit to the Site) is a certificate for general liability insurance satisfying Contract Documents requirements.

1.05 Although this Access, Indemnity and Release Agreement is not a Contract Document (see Document 00 5200 [Agreement]), it shall be fully effective and binding regardless of whether Contractor submits a Bid for the subject Project, is awarded a contract for the Project, or otherwise.

CONTRACTOR: _____

By: _____
Signature

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

By: _____
Signature

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

END OF DOCUMENT

DOCUMENT 00 2113

INSTRUCTIONS TO BIDDERS

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

ARTICLE 1 - PROCEDURES FOR SUBMISSION OF BIDS

1.01 Required Pre-Bid Conference and Site Visit:

A. Owner will conduct Pre-Bid Conference and Site Visit at the date, time and location indicated in Document 00 1113 (Notice Inviting Bids), to consider such matters as Bidders may request and perform a Site Visit immediately following, at the Site.

B. The Site Visit may be the Bidders' only opportunity to investigate conditions at the Site. Other Pre-Bid Site Visits may be scheduled at Owner's sole discretion, depending on staff availability.

C. Owner will issue Minutes of the Pre-Bid Conference, which shall constitute the sole and exclusive record and statement of the results of the Pre-Bid Conference. The Minutes issued by Owner are not Contract Documents.

1.02 Required Pre-Bid Investigations:

A. Prior to submission of Bid, Bidder must conduct a careful examination of Bidding Documents and understand the nature, extent, and location of Work to be performed. Refer to Document 00 7200 (General Conditions) on required pre-bid investigations.

B. Any Bidder wishing to investigate subsurface conditions or otherwise conduct invasive investigations, explorations, test, or studies at this Site before bidding, shall schedule such examinations with Owner by providing Owner at least seven (7) days advanced written notice. Additionally, any such Bidder must deliver an executed Document 00 2100 (Access, Indemnity and Release Agreement) and provide an insurance certificate as described therein by noon of the Day prior to the site examination. Bidders who intend only to observe Site conditions and not conduct such examinations are not required to provide an executed Document 00 2100 or an insurance certificate.

C. Bidders may examine any available existing conditions information (e.g., record documents, specifications, studies, drawings of previous work), as well as applicable environmental assessment information (if any) regarding the Project, by giving Owner reasonable advanced notice. Owner will make copies available for a fee. A Bidder must give five (5) days advanced notice if copies are desired.

1.03 Bidder Questions and Answers:

A. Bidders must direct all questions about the meaning or intent of Bidding Documents to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by written Addenda mailed, faxed, or delivered to all parties recorded by Owner as having received Bidding Documents. Owner may not answer questions received less than ten Days prior to the date for opening Bids.

B. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect, and Bidders shall not rely on oral statements.

1.04 Addenda:

A. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner. Addenda shall be acknowledged by number in Document 00 4113 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from Owner.

ARTICLE 2 - RECEIPT OF BIDS

2.01 Date and Time:

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

2.02 Two Envelope Bid Submission:

A. Owner will receive Bids in opaque sealed 10 inch x 13 inch envelopes, containing the required items described herein.

B. Bidders must submit Bids in two envelopes: "Envelope A – Bid Submittals" and "Envelope B – Statement of Qualifications."

C. Bidders should mark their Bid envelopes using the name, address, identifying information and contract number, indicated in Document 00 1113 (Notice Inviting Bids).

2.03 Required Contents of "Envelope A – Bid Submittals":

A. Document 00 4113 (Bid Form). Bidders must submit Bids on Document 00 4113 (Bid Form) in accordance with the provisions of Document 00 4113. Bidders must complete all Bid items and supply all information required by Bid documents and specifications.

B. Document 00 4313 (Bond Accompanying Bid). Bidders must submit Document 00 4313 (Bond Accompanying Bid) accompanied by a cashier's check, certified check (certified without qualification and drawn on a solvent bank of the State of California or a National Bank doing business in the State of California) or completed form of Document 00 4313 of not less than 10% of the base Bid, payable to Owner and completed in accordance with the provisions of Document 00 4313.

C. Document 00 4314 (Bidder Registration and Experience Form). Bidders must submit Document 00 4314 (Bidder Registration and Experience Form), completed in accordance with the provisions of Document 00 4314.

D. Document 00 4330 (Subcontractor List). Bidders must submit Document 00 4330 (Subcontractors List) completed in accordance with the provisions of Document 00 4330. The Subcontractors List must include the names of all subcontractors for those subcontractors who will perform any portion of work, including labor, rendering of service, or specially fabricating and installing a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of the total Bid amount. Any violation of this requirement may result in a Bid being deemed non-responsive and not being considered.

E. Document 00 4519 (Non-Collusion Affidavit). Bidders must submit Document 00 4519 (Non-Collusion Affidavit) completed in accordance with the provisions of Document 00 4519.

F. Document 00 4546 (Bidder Certifications). Bidders must submit Document 00 4546 (Bidder Certification) completed in accordance with the provisions of Document 00 4546.

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

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

ARTICLE 3 BID OPENING AND EVALUATION

3.01 Determination of Apparent Low Bidder:

A. Owner will open each Bidders' Envelope A at the time and place indicated in Document 00 1113 (Notice Inviting Bids), initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein and in Document 00 1113 (Notice Inviting Bids) and Document 00 4113 (Bid Form).

B. Apparent Low Bid will be determined solely on the total amount of all Bid items based on terms contained in Document 00 1113 (Notice Inviting Bids) and Document 00 4113 (Bid Form), or as set forth in Paragraph 2.02 of Document 00 1113 (Notice Inviting Bids. All Bidders are required to submit Bids on all Bid items.

C. For the Apparent Low Bidder only, Owner will open Envelope B and evaluate the Apparent Low Bidder for responsiveness to the requirements of Document 00 4513 and for Responsibility.

D. If Apparent Low Bidder is determined to be non-responsive or non-responsible, then Owner may proceed to the next Apparent Low Bidder's Bid pursuant to any procedures determined in its reasonable discretion, and proceed for all purposes as if this Apparent Low Bidder were the original Apparent Low Bidder.

3.02 Evaluation of Bids:

A. Bids must be full, complete, clearly written and using the required forms. Bidders shall make any change in the Bid by crossing out the original entry, entering and initialing the new entry. Bidder's failure to submit all required documents strictly as required entitles Owner to reject the Bid as non-responsive. All Bidders must submit Bids containing each of the fully executed documents supplied in this Project Manual.

B. In evaluating Bids, Owner will consider Bidders' qualifications, whether or not the Bids comply with the prescribed requirements, unit prices, and other data, as may be requested in Document 00 4113 (Bid Form) or prior to the Notice of Award.

C. Owner may conduct reasonable investigations and reference checks of Bidder and other persons and organizations as Owner deems necessary to assist in the evaluation of any Bid and to establish Bidder's responsibility, qualifications, financial ability and ability to perform the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time. Submission of a Bid constitutes Bidder's consent to the foregoing.

D. Owner shall have the right to consider information provided by sources other than Bidder. Owner shall also have the right to communicate directly with Bidder's surety regarding Bidder's bonds.

E. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.

F. Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of Owner made as part of Bid evaluation process after submission of Bid.

3.03 Reservation of Rights:

A. Owner reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder as non-responsive as a result of any error or omission in the Bid, or if Owner believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. For purposes of this paragraph, an "unbalanced Bid" is one having nominal prices for some Bid items and enhanced prices for other Bid items.

B. Owner may retain Bid securities and Bid bonds of other than the Apparent Low Bidder for a period of 90 Days after award or full execution of the Contract, whichever first occurs.

C. Owner may reject any or all Bids and waive any informalities or minor irregularities in the Bids. Owner also reserves the right, in its discretion, to reject any or all Bids and to re-Bid the Project.

3.04 Required Contractor and Subcontractor Registration:

A. Owner shall accept Bids only from Bidders that (along with all Subcontractors listed in Document 00 4330, Subcontractor List) are currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5.

B. Subject to Labor Code Sections 1771.1(c) and (d), any Bid not complying with paragraph 3.04.A, above, shall be returned and not considered; provided that if Bidder is a joint venture (Business & Professions Code Section 7029.1) or if federal funds are involved in the Contract (Labor Code Section 1771.1(a)), Owner may accept a non-complying Bid provided that Bidder and all listed Subcontractors are registered at the time of Contract award.

ARTICLE 4 MANDATORY BID PROTEST PROCEDURES

4.01 Submission of Written Bid Protest:

A. Any Bid protest in connection with the construction contract or work described in general in Document 00 1113 (Notice Inviting Bids) must be submitted in writing to the **Town's Authorized Representative, located at 2955 Woodside Road, Woodside, California 94062**, before 3:30 P.M. of the fourth Business Day following fifth Business Day following posting of Document 00 5050 (Notice of Intent to Award for Construction) at Town of Woodside, 2955 Woodside Road, Woodside, C 94062. Owner will use reasonable efforts to deliver by facsimile a copy of Document 00 5050 to all Bidders who submitted Bids no later than the Business Day after issuance, although any delay or failure to do so will not extend the Bid protest deadline described above.

B. The initial protest document must contain a complete statement of the basis for the protest.

C. The protest must refer to the specific portion of the document that forms the basis for the protest.

D. The protest must include the name, address, and telephone number of the person representing the protesting party.

E. Only Bidders who the Owner otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, Owner may evaluate all information contained in any protesting Bidder's Bid, and conduct the same investigation and evaluation as Owner is entitled to take regarding an Apparent Low Bidder.

F. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

4.02 Exclusive Remedy:

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

ARTICLE 5 AWARD AND EXECUTION OF CONTRACT

5.01 Notice of Award and Submittal of Executed Contract Documents:

A. If Contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. Owner will issue Document 00 5100 Notice of Award. Such Award, if made, will be made within ninety (90) days after the opening of the Bid Proposals.

B. Successful Bidder must execute and submit to Owner the "Required Contract Documents and Proof of Insurance" set forth below, by 5:00 p.m. of the 20th Day following the Notice of Award.

5.02 Required Contract Documents and Proof of Insurance:

A. Document 00 5200 (Agreement), fully executed by successful Bidder. Submit four originals, each bearing an original signature on the signature page and initials on each page.

B. Document 00 6113.13 (Construction Performance Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.13. Submit one original.

C. Document 00 6113.16 (Construction Labor and Material Payment Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.16. Submit three originals.

D. Document 00 6536 (Guaranty), fully executed by successful Bidder. Submit one original, bearing an original signature on the signature page and initials on each page.

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

F. Any other items identified by Owner in Document 00 5100 (Notice of Award).

5.03 Failure to Execute and Deliver Documents:

A. If Bidder to whom Contract is awarded, within the period described in this Document 00 2113, fails or neglects to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, Owner may, in its sole discretion, rescind the award, recover on Bidder's surety bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract Documents. Bidder agrees that calculating the damages Owner may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of Owner's damages.

B. Upon such failure to timely deliver all required Contract Documents as set forth herein, Owner may determine the next Apparent Low Bidder and proceed accordingly. Such Award, if made, will be made within sixty (60) days after the opening of the Bid Proposals.

ARTICLE 6 GENERAL CONDITIONS AND REQUIREMENTS

6.01 Modification of Commencement of Work:

A. Owner expressly reserves the right to modify the date for the Commencement of Work under the Contract and to independently perform and complete work related to Project. Owner accepts no responsibility to Contractor for any delays attributed to its need to complete independent work at the Site.

B. Owner shall have the right to communicate directly with Apparent Low Bidder's proposed performance bond surety, to confirm the performance bond. Owner may elect to extend the time to receive faithful performance and labor and material payment bonds.

6.02 Conformed Project Manual:

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

6.03 Payment Bond:

A. If the Project described in Document 00 1113 (Notice Inviting Bids) involves an expenditure in excess of twenty-five thousand dollars ($25,000), the successful Bidder must file a payment bond

with and approved by Owner prior to entering upon the performance of the Work, in accordance with Civil Code Section 9550, *et seq*.

6.04 Wage Rates:

A. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at the **Town's Public Works Department** and may be obtained from the California Department of Industrial Relations website [http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm] and are deemed included in the Bidding Documents. Upon request, Owner will make available copies to any interested party. Also, Contractor shall post the applicable prevailing wage rates at the Site.

6.05 Withdrawal of Bids:

A. Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 00 2113, only by written request for the withdrawal of Bid filed with Owner at the **Town Clerk's Office, located at 2955 Woodside Road, Woodside, California 94062.** Bidder or its duly authorized representative shall execute request to withdraw Bid.

6.06 Ineligible Contractors and Subcontractors:

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

6.07 Public Records Act Requests:

A. Per the Public Records Act, Owner will make available to the public Bidder's SOQ (if bidder's Envelope B is opened), all correspondence and written questions submitted during the Bid period, all Bid submissions opened in accordance with the procedures set forth herein, and all subsequent Bid evaluation information. All submissions not opened will remain sealed and shall be returned to the submitter. Except as otherwise require by law, Owner will not disclose trade secrets or proprietary financial information submitted by Bidders that has been designated as confidential by Bidder (including but not limited to the (SOQ). Any such trade secrets or proprietary financial information that Bidder believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections shall not be permitted and shall be invalid. The specific confidential information must be clearly identified as such.

B. Upon a request for records regarding this Bid, Owner will notify the Bidder involved, within ten Days from receipt of the request, when the records will be made available for inspection. If the Bidder timely identifies any "proprietary, trade secret, or confidential commercial or financial" information that Bidder determines is not subject to public disclosure, and requests that Owner refuse to comply with the records request, Bidder shall take all appropriate legal action and defend Owner's refusal to produce the information in all forums; otherwise Owner will make such information available to the extent require by applicable law, without restriction.

C. Information disclosed in the SOQ and the attendant submissions are the property of Owner unless Bidder makes specific reference to data that is considered proprietary. Subject to the requirements in the Public Records Act, reasonable efforts will be made to prevent the disclosure of information except on a need-to-know basis during the evaluation process.

6.08 Substitutions:

A. Bidders must base their Bids on products and systems specified in Contract Documents or listed by name in Addenda. Owner will consider substitution requests only for “or equal items.” Bidders wanting to use “or equal” item(s) may submit Document 00 6325 (Substitution Request Form) no later than 35 Days after Notice of Award. As a limitation on Bidder's privilege to request substitution of “or equal” items, Owner has found that certain items are designated as Owner standards and certain items are designated to match existing items in use on a particular public improvement either completed or in the course of completion or are available from one source. As to such items, Owner will not permit substitution. Such items (if any) are described in Document 00 1113 (Notice Inviting Bids).

6.09 Definitions:

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

END OF DOCUMENT

DOCUMENT 00 3132

GEOTECHNICAL DATA AND EXISTING CONDITIONS

ARTICLE 1 REPORTS AND INFORMATION ON EXISTING CONDITIONS

1.01 Inspection of Reports:

A. Owner, its consultants, and prior contractors may have collected documents providing a general description of the Site and conditions of the Work. These documents may consist of geotechnical reports for and around the Site, contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, information regarding Underground Facilities, and hazardous material surveys or information (collectively, **Existing Conditions Data**.)

B. Bidders may inspect Geotechnical and Existing Conditions Data. These documents are listed in Section 01 1100 (Summary of Work) and are available for review at the address identified therein. Copies may be obtained for the cost of reproduction and handling upon Bidder's payment for the costs.

C. Existing Conditions Data is for information only and does not describe labor, materials or equipment furnished by Contractor, but rather, information regarding conditions of the work. Such Existing Conditions Data is not a Contract Document.

ARTICLE 2 USE OF EXISTING CONDITIONS DATA

2.01 Above-Ground Existing Conditions:

A. Owner makes no warranty or representation of existing aboveground conditions, as-built conditions, or other aboveground actual conditions verifiable by reasonable independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform prior to bidding and Bidder must not rely on the information supplied by Owner regarding existing conditions.

B. Bidder represents and agrees that in submitting its Bid, it is not relying on any information regarding above-ground existing conditions supplied by Owner.

2.02 Underground Facilities:

A. Information supplied regarding existing Underground Facilities at or contiguous to the Site is based on information furnished to Owner by others (e.g., the builders of such Underground Facilities or others).

B. Owner assumes responsibility for only the general accuracy, completeness or thoroughness of information regarding Underground Facilities that are owned by Owner. This express assumption of responsibility applies only if Bidder has conducted the independent investigation required of it under Document 00 7200 (General Conditions) and discrepancies were not apparent. Bidder is solely responsible for any interpretation or conclusion drawn from this information. Owner is not responsible for information regarding Underground Facilities that are owned by others.

2.03 Hazardous Materials Surveys:

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

B. Data and information regarding the locations of hazardous materials are not part of Contract Documents.

2.04 Geotechnical Data:

A. Bidder may rely upon the general accuracy of the "technical data" contained in the geotechnical reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required of it and discrepancies were not apparent.

B. The term **"technical data"** shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment, or structures that were encountered during subsurface exploration. The term "technical data" does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures. The term "technical data" shall not include the location of Underground Facilities.

C. Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information contained in supplied geotechnical data.

2.05 Except as expressly set forth in this Document 00 3132, Owner does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data.

A. Bidder represents and agrees that in submitting its Bid, it is not relying on any geotechnical data supplied by Owner, except as specifically set forth herein.

ARTICLE 3 INVESTIGATIONS

3.01 Required Investigations:

A. Before submitting a Bid, each Bidder shall be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.

B. Bidders shall advise Owner in writing during the Bid period of any questions, suppositions, inferences or deductions Bidders may have for Owner's review and response.

C. Owner has provided time in the period prior to bidding for Bidder to perform these investigations.

3.02 Access to Site for Investigations:

A. During the Pre-Bid Site Visit(s), Owner will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid, provided that invasive testing will be permitted only to the extent provided in Document 00 2113 (Instructions to Bidders), and provided that each Bidder seeking access to conduct such investigations provides Document 00 2100 (Access, Indemnity and Release Agreement). Bidders must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 2113 (Instructions to Bidders) and Document 00 7200 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Bidder shall supply all equipment required to perform any investigations as each Bidder deems necessary. Owner has the right to limit the number of pieces of machinery operating at any one time due to safety concerns or in order to protect or maintain the Site from potential damage or interruption to general operational activities.

END OF DOCUMENT

DOCUMENT 00 4113

BID FORM

TO THE TOWN OF WOODSIDE

THIS BID IS SUBMITTED BY:

_____
(Firm/Company Name)

Re: **TOWN CENTER SEWER PUMP STATION IMPROVEMNTS** at **2995 Woodside Road**

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the **TOWN OF WOODSIDE** in the form included in the Contract Documents, Document 00 5200 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Contract Documents, Document 00 1113 (Notice Inviting Bids), and Document 00 2113 (Instructions to Bidders) including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 Days after the day of Bid opening, unless there is a bid protest, then 90 days after the day of bid opening.
3. In submitting this Bid, Bidder represents that Bidder has examined all of the Contract Documents, performed all necessary Pre-Bid investigations, attended the Pre-Bid Meeting, received the Pre-Bid Meeting minutes (if any), and received the following Addenda:

Addendum Number	**ADDENDUM DATE**	**Signature of Bidder**

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

SCHEDULE OF BID PRICES

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

BASEBIDSCHEDULE					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.	Mobilization and Site Preparation	1	LS	$	$
2.	Abandon Existing6” PVC	125	LF	$	$
3.	Abandon Existing Manhole	1	EA	$	$
4.	Water Pollution and Erosion Control	1	LS	$	$
5.	Asphalt Concrete Paving	38	TON	$	$
6.	Rehabilitate Existing Wetwell	1	EA	$	$
7.	48”Dia.InsideSanitarySewerDropMH	1	EA	$	$
8	72”Dia.PrecastWetWell	1	EA	$	$
9.	Two(2)-Flygt Submersible Pumps Model NP-31	1	LS	$	$
10.	2” PVC SCH80 Drain Pipe	35	LF	$	$
11.	4” DIP Force Main	96	LF	$	$
12.	6” PVC SDR26	28	LF	$	$
13.	8” PVC SDR26	66	LF	$	$
14.	12” PVC SDR26	24	LF	$	$
15.	3” PVC SDR26	25	LF	$	$
16.	1” Copper Water Service Line & Hose Bib	70	LF	$	$
17.	Pump Fittings and Appurtenances	1	LS	$	$
18.	Electrical Service and Cabinet Control Panel with Automatic Transfer Switch	1	LS	$	$
19.	Electrical and Communication Conduit and Wire	1	LS	$	$
20.	Instrument and Control System	1	LS	$	$
21.	Electrical Startup	1	LS	$	$

22.	Diesel Generator	1	LS	$	$
23.	Timber Lagging Retaining Wall	1	LS	$	$
24.	PCC Concrete Pad & Dike	1	LS	$	$
TOTAL				TOTAL BID PRICE	$

Total Bid Price:

_____

(Indicate Bid Price in Words)

5. The undersigned acknowledges that the Apparent Low Bidder will be determined as provided in Documents 00 1113 (Notice to Bidders) and Document 00 2113 (Instruction to Bidders).

6. Subcontractors for work are listed on Document 00 4330 (Subcontractors List), submitted herewith.

7. The undersigned Bidder understands that Owner reserves the right to reject this Bid.

8. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the undersigned Bidder within the time described in Paragraph 2 of this Document 00 4113 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Document 00 2113 (Instructions to Bidders) within the times specified therein.

9. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.

10. The undersigned Bidder herewith encloses cash, a cashier's check, or certified check of or on a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do a surety business in the State of California, in form specified in Document 00 2113 (Instructions to Bidders), in the amount of ten percent (10%) of the Total Bid Price and made payable to the **TOWN OF WOODSIDE**.

11. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Document 00 7200 (General Conditions) and to complete all Work within the time specified in Document 00 5200 (Agreement).

12. The undersigned Bidder agrees that, in accordance with Document 00 7200 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Document 00 5200 (Agreement) shall be as set forth in Document 00 5200.

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

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

NAME OF BIDDER: _____

licensed in accordance with an act for the registration of Contractors, and with license

number:_____Expiration: _____.

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

_____
(Principal)

_____
(Principal)

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

_____
(Signature of Bidder)

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

Business Address: _____

_____

_____

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

_____
(Name/Title)

_____
(Name/Title)

Officers Authorized to Sign Contracts _____
(Name/Title)

_____
(Name/Title)

_____
(Name/Title)

Telephone Number(s): _____
(Area Code) (Number)

_____
(Area Code) (Number)

Fax Number(s): _____
(Area Code) (Number)

_____
(Area Code) (Number)

Date of Bid: _____

END OF DOCUMENT

DOCUMENT 00 4313
BOND ACCOMPANYING BID

KNOW ALL BY THESE PRESENTS:

That the undersigned

_____,
(Name of Contractor)

as Principal and the undersigned as Surety are held and firmly bound unto Owner, **TOWN OF WOODSIDE, a California municipal corporation**, as obligee, in the penal sum of **(Dollar Amount In Words)**_____ Dollars **($_____ _____)** lawful money of the United States of America being at least ten percent (10%) of the aggregate amount of said Principal's base Bid, for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal is submitting a Bid for **TOWN CENTER SEWER PUMP STATION IMPROVEMENTS** at **2995 WOODSIDE ROAD.**

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

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

(Corporate Seal) By _____
Principal

By _____
Surety

(Corporate Seal) By _____
Attorney in Fact

END OF DOCUMENT

DOCUMENT 00 4314

BIDDER REGISTRATION FORM

INDEPENDENT CONTRACTOR REGISTRATION

Contractor's License # _____

Date: _____ Fed I.D. # _____

Full Corporate Name of Company: _____

Street Address: _____

_____

Mailing Address: _____

_____

Phone: _____Fax: _____

Name of Principal Contact: _____

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

INSURANCE

Workers' Compensation:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

General Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Automobile Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

All-risk Course of Construction (if applicable, as required by Document 00 7316 – Insurance and Indemnification):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Professional Liability (if applicable, as required by Document 00 7316 – Insurance and Indemnification):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

Pollution Legal Liability Insurance (if applicable, as required by Document 00 7316 – Insurance and Indemnification):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: $ _____

A.M. Best Rating: _____

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

_____
SIGNATURE

_____
DATE

SAFETY EXPERIENCE

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

1. List Bidder's interstate Experience Modification Rate for the last three years.

   [20__] _____ [20__] _____ [20__] _____

2. Use Bidder's last year's Cal/OSHA 201 log to fill in the following number of injuries and illnesses:

   a. Number of lost workday cases _____

   b. Number of medical treatment cases _____

   c. Number of fatalities _____

3. Employee hours worked last year _____

4. State the name of Bidder's safety engineer/manager:

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

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

BIDDER:

By: _____
Signature

Its: _____
Title

Date_____

END OF DOCUMENT

DOCUMENT 00 4330

SUBCONTRACTORS LIST

The Subcontractors List must include the names of all subcontractors for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of the total Bid amount.

Name of Subcontractor and Location of Place of Business	Description of Work	Subcontractor's License No.	DIR Registration Number*

(Bidder to attach additional sheets if necessary)

* Pursuant to Division 2, Part 7, Chapter 1 (commencing with section 1720) of the California Labor Code.

END OF DOCUMENT

DOCUMENT 00 4513

STATEMENT OF QUALIFICATIONS FOR CONSTRUCTION WORK

ARTICLE 1 – GENERAL INFORMATION

1.01 Minimum Bidder Qualifications:

A. Bidders must be duly licensed in accordance with the California Business & Professions Code and have a history of work performance sufficient to meet the requirements of a responsible bidder in the California Public Contract Code Section 1103.

B. Bidders must have three **[(3) years]** experience as a continuously operating entity engaged in the performance of similar work.

C. Bidders must demonstrate successful experience with type of work of this Project, to include, within the past year, completed two (2) projects of a similar nature and complexity with a contract dollar amount of at (i.) least 75% of the amount of Bidder's Bid or (ii.) 125% of such amount in the aggregate.

1.02 Measurement:

A. Bidder's compliance with the minimum qualification requirements will be measured by Bidder's experience as an operating entity and also by the experience of the supervisory personnel who will have responsible charge of the various major components of the Work.

B. If Bidder subcontracts portions of the Work, Owner, in its determination of whether the minimum qualification requirements have been met, may consider the qualifications of the Subcontractor's supervisory personnel.

C. The qualifications of the Key Personnel are to be submitted with the Statement of Qualifications (**SOQ**), by providing the information described in this Document 00 4513.

ARTICLE 2 – REQUIRED CONTENTS OF SOQ SUBMISSION

2.01 Transmittal Letter:

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

2.02 Submittals:

A. Completed Questionnaires. Bidder shall include a completed Statement of Qualification Questionnaire in the form attached to this Document 00 4513 as Attachment A. Also, if any Subcontractors (**Designated Subcontractors**) are identified below, Bidder must include a Part D to the Questionnaire for each Designated Subcontractors:

1. Designated Subcontractor 1: _____
2. Designated Subcontractor 2: _____

B. Resumes of Proposed Key Personnel. Bidder shall provide a resume for each named Key Personnel of Bidder and any Designated Subcontractors, to include as necessary: Years of experience; Education - degrees, schools and years obtained; Professional Registrations; Fluency in English (Yes/No); At least two client references, including contact names, addresses and telephone numbers, and description of projects of a similar nature worked on in the past five years.

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

D. Surety Letter re: Capability to Provide Required Performance and Payment Bonds. Bidder shall

include a letter from a surety duly licensed to do business in the State of California, having a financial rating from A.M. Best Company of **[A-, VIII]** or betterins, that the surety has agreed to provide Bidder with the required performance and payment bonds in accordance with the requirements set forth in Documents 00 6113.13 (Construction Performance Bond) and 00 6113.16 (Construction Labor and Material Payment Bond), each in the penal sum of the Contractor's bid when submitted. Owner shall have the right to verify with the surety that the surety, based upon the Bid prices, will issue the required bonds under the conditions stated.

E. Insurer Letter re: Capability to Provide the Required Insurance. Bidder shall provide a letter from an insurance underwriter, having a financial rating reasonably acceptable to Owner, confirming that the insurer will provide Bidder the required coverages and amounts specified in the Contract Documents.

F. Description of Human and Physical Resources. Bidder shall identify, describe, and quantify for itself, the following technical information for the construction work: Description and location of manufacturing facilities, naming products and quantifying production capacity and current demand; Description of field organization(s), naming skills and equipment; Description of safety program quality control procedures, and safety experience; and

G. License: Evidence of a valid contractor's license and required licenses of all licensees of persons who are Key Personnel necessary to perform the Work.

H. Litigation History. Description of litigation history for the past three years including names of involved parties, nature of dispute, and disposition.

2.03 Format:

A. The SOQ shall be clear and concise to enable management-oriented personnel to make a thorough evaluation and arrive at a sound determination as to whether the SOQ meet Owner's requirement. To this end, the SOQ should be so specific, detailed and complete as to demonstrate clearly and fully that the Bidder has a thorough understanding of and has demonstrated knowledge of the requirements to perform the Work (or applicable portion thereof).

B. Any explanation requested by a Bidder regarding the meaning or interpretation of this Document 00 4513 must be requested in writing and with sufficient time allowed for a reply to reach Bidder before the submission of its SOQ. Oral explanations or instructions will not be binding. Any information provided to any prospective Bidder concerning this Document 00 4513 will be furnished to all prospective Bidders as an Addendum to the Bidding Documents.

[STATEMENT OF QUALIFICATION QUESTIONNAIRE FOLLOWS ON NEXT PAGE]

ATTACHMENT A – Statement of Qualification Questionnaire

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

CONTACT INFORMATION

Company Name: _____

Owner of Company: _____

Contact Person: _____

Address: _____

Phone: _____ Fax: _____

PART A: GENERAL INFORMATION

1. Does Bidder possess a valid and current California Contractor's license for the work proposed? Yes ___No ____
2. Does Bidder have a minimum of $5,000,000 liability insurance coverage? Yes ___No ____
3. Has Bidder's License been revoked at any time in the last five years? Yes ___No ____
4. Has Bidder been "default terminated" by an Owner (other than for convenience), or has a Surety completed a contract for Bidder within the last five years? Yes ___No ____
5. Has Bidder been convicted more than twice for failure to pay prevailing wages in the last three years? Yes ___No ____
6. Has Bidder attached copies of its reviewed or audited financial statements and accompanying notes for the last three years? Yes ___No ____
7. Are Bidder and all listed subcontractors registered and qualified with the Department of Industrial Relations pursuant to Labor Code Section 1725.5? Yes ___No ____

Bidder may be disqualified if any answer to questions 1, 2, 6, or 7 is No.
Bidder may be disqualified if any answer to questions 3, 4, or 5 is Yes.

PART B: SAFETY, PREVAILING WAGE, DISPUTES AND BONDS

(SAFETY)

1. Has Cal/OHSA, Federal OSHA, the EPA or any Air Quality Management Owner cited Bidder in the past five years?
   Yes ___No ____ If yes, attach description of each citation.

2. How often does Bidder require documented safety meetings be held for:
   Field Supervisor Weekly Bi-Weekly _____ Monthly _____ Less Than Monthly
   Employees Weekly Bi-Weekly _____ Monthly _____ Less Than Monthly
   New Hires Weekly Bi-Weekly _____ Monthly _____ Less Than Monthly
   Subcontractors Weekly _____ Bi-Weekly _____ Monthly _____ Less Than Monthly _____

3. How often does Bidder conduct documented safety inspections?
   Quarterly _____ Semi-annually _____ Annually _____Other _____

4. Does Bidder have home office safety representatives who visit/audit the job site?
   Quarterly _____ Semi-annually _____ Annually _____Other _____

5. What is Bidder's Interstate Experience Modification Rate? _____. (A rating in excess of ***[1]*** may constitute grounds for disqualification as non-responsible).

(PREVAILING WAGE PROVISIONS)

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

(LICENSE PROVISIONS)

7. Has Bidder changed names or license numbers in the past 5 years? If so, please state reason for change.

   Yes _____ No _____ Reason:_____
   _____

(DISPUTES)

8. In the past five years, has Bidder on any project that Bidder performed construction services made any written claim against any owner for additional compensation or additional time, that the owner disputed, exceeding on a per project basis an aggregate amount of $100,000 or 10% of the original contract sum? If yes, attach description of each instance including details of total claim(s) amount, resolution description including amount, and Owner's name and phone number.
   Yes _____ No _____

9. In the past five years, has any owner on any project that Bidder performed construction services asserted any written claim against Bidder for delay, defective work, warranty work, back charges and/or offsets, that the Bidder disputed, exceeding on a per project basis, an aggregate amount of $100,000 or 10% of the original contract sum? If yes, attach description of each instance including details of total claim(s) amount, resolution description including amount, and Owner's name and phone number.
   Yes _____ No _____

(BONDING)

10. Bonding Capacity – Provide documentation from Bidder's surety identifying the following:
    Name of bonding company/surety: _____

    Name of Surety Agent: _____

    Surety Agent address: _____

    Surety Agent phone number: _____

    Is surety a California-admitted surety? Yes _____ No _____

    Is surety listed in the current edition of the California Department of the Treasury's Listing of approved sureties? Yes _____No _____

    List surety's A.M. Best Rating: _____

    What is Bidder's total bonding capacity? _____

    What percent does Bidder pay for bonds? _____

PART C: EXPERIENCE OF PRIME CONTRACTOR

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

Prime Contractor. List three projects of similar size and scope to the Work of the Contract, completed in the past two (2) years, and indicate who were the superintendent, project manager and scheduler. NOTE: This listing will be used to assess compliance with the stated minimum qualifications in Paragraph 1.01.

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

Key Personnel.

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

Project Manager: _____

Project Superintendent: _____

Project Scheduler: _____

Recent Projects.

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

1. Project Name: _____

   Location: _____

   Owner: _____

   Owner Contact (name and phone): _____

   Architect/Engineer: _____

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

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

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount: _____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

2. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

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

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

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount: _____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

3. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

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

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

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount:_____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

PART D: EXPERIENCE OF DESIGNATED SUBCONTRACTOR
[See Document 00 4513 Paragraph 2.02.A]

The nature of this Project requires prior similar experience for the Designated Subcontractor(s) performing the Work. Summarize similar project experience below and provide the detailed project information requested:

Designated Subcontractor. List three (3) projects of similar size and scope to the Work of the Contract, completed in the past two (2) years, and indicate who were the superintendent, project manager and scheduler. NOTE: this listing will be used to assess compliance with the stated minimum qualifications in Paragraph 1.01.

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

Key Personnel.

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

Project Manager: _____

Project Superintendent: _____

Project Scheduler: _____

Recent Projects.

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

1. Project Name: _____

   Location: _____

   Owner: _____

   Owner Contact (name and phone): _____

   Architect/Engineer: _____

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

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

   Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount: _____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

2. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

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

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

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount: _____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

3. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

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

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

Description of Project, Scope of Work Performed: _____

_____

Total Construction Cost: _____

Total Change Order Amount:_____

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

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of Days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

PART E: FINANCIAL INFORMATION

1. Has Bidder ever reorganized under the protection of bankruptcy laws?
   Yes _____ No _____ If yes, please state when _____

2. If Bidder has had the general liability carrier identified in Document 00 4314 (Bidder Registration and Safety Experience Form) for less than 5 years, please provide additional information below for balance of the last 5 years:

   Agency Name: _____

   Contact Name: _____

   Phone Number _____

   Carrier: _____ A.M. Best Rating: _____

   Carrier: _____ A.M. Best Rating: _____

   Carrier: _____ A.M. Best Rating: _____

3. Has Bidder ever had insurance terminated by a carrier? Yes _____No _____
   If yes, explain on a separate signed sheet marked with correlating cross-reference to this paragraph of the questionnaire.

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

_____
SIGNATURE

_____
TITLE

END OF DOCUMENT

DOCUMENT 00 4519

NON-COLLUSION AFFIDAVIT

PUBLIC CONTRACT CODE §7106

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

STATE OF CALIFORNIA)
) ss.
COUNTY OF_____)

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

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

of _____, the party
(Name of Bidder)

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

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

_____
(Name of Bidder)

_____
(Signature of Principal)

Subscribed and sworn before me _____

This _____ day of _____, 201__

Notary Public of the State of _____

In and for the County of_____

My Commission expires_____ (Seal)

NOTE: If Bidder is a partnership or a joint venture, this affidavit must be signed and sworn to by every member of the partnership or venture.

NOTE: If Bidder [including any partner or venturer of a partnership or joint venture] is a corporation, this affidavit must be signed by the Chairman, President, or Vice President and by the Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer.

NOTE: If Bidder's affidavit on this form is made outside the State of California, the official position of the person taking such affidavit shall be certified according to law.

END OF DOCUMENT

DOCUMENT 00 4546

BIDDER CERTIFICATIONS

TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to Owner as set forth in sections 1 through 7 below.

1. STATEMENT OF CONVICTIONS

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

2. CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Labor Code Section 3700 that require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

3. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

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

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

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

5. CERTIFICATION OF NON-DISCRIMINATION

By my signature hereunder, as the Contractor, I certify that there will be no discrimination in employment with regard to race, color, religion, gender, sexual orientation, age or national origin; that all federal, state, and local directives and executive orders regarding non-discrimination in employment will be complied with; and that the principal of equal opportunity in employment will be demonstrated positively and aggressively.

6. CERTIFICATION REGARDING PREVIOUS DISQUALIFICATION

By my signature hereunder, as the Contractor, I swear, under penalty of perjury, that the below indicated Bidder, any officer of Bidder, or any employee of Bidder who has a proprietary interest in such Bidder, has never been disqualified, removed, or otherwise prevented from bidding on, or completing a Federal, State, or local government project because of a violation of law or safety regulation, except as indicated on the separate sheet attached hereto entitled "Previous Disqualifications." If a statement of "Previous Disqualifications" is attached, please explain the circumstances.

7. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to

allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that Owner will be relying on this certification if it awards the Contract to the undersigned.

BIDDER: _____
(Name of Bidder)

Date: _____, **[201]** By:_____
(Signature)

Name:_____
(Print Name)

Its:_____
(Title)

END OF DOCUMENT

DOCUMENT 00 5050

NOTICE OF INTENT TO AWARD FOR CONSTRUCTION

DATE POSTED:

PROJECT TITLE: **TOWN OF WOODSIDE**
TOWN CENTER SEWER PUMP STATION IMPROVEMENTS
at 2995 WOODSIDE ROAD

_____, the _____of

Owner intends to recommend to its **Town Council** the Award of the above-referenced Project to

_____.
(Name of Contractor)

OWNER: TOWN OF WOODSIDE

By: _____

_____
(Print name)

Title: _____

Date: _____

END OF DOCUMENT

DOCUMENT 00 5100

NOTICE OF AWARD

Dated TO:

ADDRESS:

CONTRACT FOR: **TOWN OF WOODSIDE**
TOWN CENTER SEWER PUMP STATION IMPROVEMENTS
AT 2995 WOODSIDE ROAD

The Contract Sum of your contract is _____
(Amount in Words)

Dollars ($)

1. Five copies of the proposed Contract Documents listed below accompany this Notice of Award.

2. You must comply with the following conditions precedent by **[5:00 p.m.]** of the **[20th Day]** following the date of this Notice of Award, that is, by **[Day of the Week, Month Day, 201__]**.

   a. Deliver to Owner **two** fully executed counterparts of Document 00 5200 (Agreement). Each copy of Document 00 5200 (Agreement) must bear your original signature on the signature page and your initials on each page.

   b. Deliver to Owner three originals of Document 00 6113.13 (Construction Performance Bond), executed by you and your surety.

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

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

   e. Deliver to Owner one fully executed Document 00 6536 (Guaranty), bearing your original signature on the signature page and your initials on each page.

3. Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

4. Within **[21 Days]** after you comply with the conditions in Paragraph 2 of this Document 00 5100, Owner will return to you one fully signed counterpart of Document 00 5200 (Agreement) with **[one]** copies of the Project Manual (including Specifications and Drawings) and **[one]** sets of full-size Drawings.

5. Before you may start any Work at the Site, you must attend a pre-construction conference. The pre-construction conference may be arranged through **Sindhi Mekala (650) 851-6790.** Questions regarding bonds and insurance may be directed to **Sindhi Mekala** at the same number. All other inquiries regarding the Project should be directed to **Sindhi Mekala.**

6. Upon commencement of the Work, you and each of your Subcontractors shall certify and provide Owner copies of payroll records in accordance with Labor Code Section 1776.

OWNER: TOWN OF WOODSIDE

By: _____
(Signature)

_____
(Print Name)

_____
(Title)

ATTEST: _____
Secretary

_____
(Print Name)

AUTHORIZED BY TOWN RESOLUTION:

NO:

ADOPTED:

END OF DOCUMENT

DOCUMENT 00 5200

AGREEMENT

THIS AGREEMENT, dated this **[date]** day of **[Month], [201__]**, by and between **[Enter Name of Contractor]** whose place of business is located at **[Address of Contractor**] (**Contractor**), and **TOWN OF WOODSIDE**, a California municipal corporation (**Owner**), acting under and by virtue of the authority vested in Owner by the laws of the State of California.

WHEREAS, Owner, by its Resolution No. **[Insert Number]** adopted on the **[date] day of [Month, Year]** awarded to Contractor the following Contract:

TOWN CENTER SEWER PUMP STATION IMPROVEMENTS
at
2995 WOODSIDE ROAD WOODSIDE, CA 94062

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

ARTICLE 1 SCOPE OF WORK OF THE CONTRACT

1.01 Work of the Contract:

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

1.02 Price for Completion of the Work:

A. Owner shall pay Contractor the following Contract Sum (**Contract Sum**) for completion of Work in accordance with Contract Documents as set forth in Contractor's Bid, attached hereto.

B. The Contract Sum includes all allowances (if any).

[ATTACHMENT]

COMMENCEMENT AND COMPLETION OF WORK

1.03 Commencement of Work:

A. Contractor shall commence Work on the date established in the Notice to Proceed (**Commencement Date**).

B. Owner reserves the right to modify or alter the Commencement Date.

1.04 Completion of Work:

A. Contractor shall achieve Substantial Completion of the entire Work by October 31, 2016.

B. Contractor shall achieve **Final Completion** of the entire Work and be ready for Final Payment in accordance with Section 00 7200 (General Condition) within **100 Working** Days from the Commencement Date.

ARTICLE 2 PROJECT REPRESENTATIVES

2.01 Owner's Project Manager:

A. Owner has designated **Sindhi Mekala** as its Project Manager to act as Owner's Representative in all matters relating to the Contract Documents. If Project Manager is an employee of Owner,

Project Manager is the beneficiary of all Contractor obligations to Owner including, without limitation, all releases and indemnities.

B. Project Manager shall have final authority over all matters pertaining to the Contract Documents and shall have sole authority to modify the Contract Documents on behalf of Owner, to accept work, and to make decisions or actions binding on Owner, and shall have sole signature authority on behalf of Owner.

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

2.02 Contractor's Project Manager and Other Key Personnel:

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

B. Contractor has designated the following other Key Personnel for the Project:

Name	Position
_____	Superintendent ***[See Doc. 00 7200 Para. 8.01.B]***
_____	_____
_____	_____

2.03 Architect/Engineer:

A. **Mark Thomas and Company** furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.

B. Architect/Engineer has designated **Richard Tanaka** as its project manager, to act as its representative for receiving and making communications authorized under the Contract Documents.

ARTICLE 3 LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK

3.01 Liquidated Damage Amounts:

A. As liquidated damages for delay Contractor shall pay Owner One thousand dollars ($ 1,000 .00) for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.

3.02 Scope of Liquidated Damages:

A. Measures of liquidated damages shall apply cumulatively.

B. Limitations and stipulations regarding liquidated damages are set forth in Document 00 7200 (General Conditions).

ARTICLE 4 LIQUIDATED DAMAGES FOR UNAUTHORIZED CHANGES OF KEY PERSONNEL

4.01 Liquidated Damage Amounts:

A. See Document 00 7200 (General Conditions) Paragraph 11.07.D for liquidated damages provisions pertaining to Key Personnel.

ARTICLE 5 CONTRACT DOCUMENTS

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

Document 00 4113	Bid Form
Document 00 4330	Subcontractors List
Document 00 4513	Statement of Qualifications for Construction Work
Document 00 4519	Non-Collusion Affidavit
Document 00 4546	Bidder Certifications
Document 00 5100	Notice of Award
Document 00 5200	Agreement
Document 00 5500	Notice to Proceed
Document 00 6113.13	Construction Performance Bond
Document 00 6113.16	Construction Labor and Material Payment Bond
Document 00 6290	Escrow Agreement for Security Deposits
Document 00 6325	Substitution Request Form
Document 00 6530	Release of Claims
Document 00 6536	Guaranty
Document 00 7200	General Conditions
Document 00 7316	Supplementary Conditions–Insurance and Indemnification
Document 00 7380	Apprenticeship Program
Document 00 9113	Addenda
Technical Specification/Special Provisions	
Drawings/Plans	

5.02 There are no Contract Documents other than those listed in this Document 00 5200, Article 5. The Contract Documents may only be amended, modified or supplemented as provided in Document 00 7200 (General Conditions).

ARTICLE 6 MISCELLANEOUS

6.01 Terms and abbreviations used in this Agreement are defined in Document 00 7200 (General Conditions) and Section 01 4200 (References and Definitions) and will have the meaning indicated therein.

6.02 It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of Owner or acting as an employee, agent, or representative of Owner, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of Owner is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable law.

6.03 Pursuant to Labor Code Section 1771(a), Contractor represents that it and all of its Subcontractors are currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Contractor covenants that any additional or substitute Subcontractors will be similarly registered and qualified.

6.04 In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with §16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the

subcontract. This assignment shall be made and become effective at the time Owner tenders final payment to Contractor, without further acknowledgment by the parties.

6.05 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at the Town's Public Works Department, may be obtained from the California Department of Industrial Relations website [http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm] and are deemed included in the Contract Documents, and shall be made available to any interested party on request. Pursuant to Labor Code Sections 1860 and 1861, in accordance with Labor Code Section 3700, every contractor will be required to secure the payment of compensation to his employees. Contractor represents that it is aware of the provisions of Labor Code Section 3700 that require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.

6.06 This Agreement and the Contract Documents shall be deemed to have been entered into in the County in which the Project is located, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the in which the Project is located.

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

CONTRACTOR: [CONTRACTOR'S N AM E]

By: _____
(Signature)

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

By: _____
(Signature)

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

OWNER: **TOWN OF WOODSIDE**

By:_____
(Signature)

_____
(Print Name)

_____
(Title)

Attest:_____
Secretary

_____
(Print Name)

[OPTIONAL IF REQUIRED BY OWNER]

APPROVED AS TO FORM AND LEGALITY
THIS __ DAY OF _____, **[201__]**

By:_____
Attorney for Owner

_____
(Print Name)

RESOLUTION NO. _____

END OF DOCUMENT

DOCUMENT 00 5500

NOTICE TO PROCEED

Dated:

To: _____
(Contractor)

Address:

CONTRACT FOR: **TOWN OF WOODSIDE**
TOWN CENTER SEWER PUMP STATION IMPROVEMENTS
at 2995 WOODSIDE ROAD

You are notified that the Contract Time under the above Contract will commence to run on _____ **[201__]**. On that date, you are to start performing your obligations with respect to Work at the Site under the Contract Documents. In accordance with Article 2 of Document 00 5200 (Agreement), the dates of Substantial Completion and Final Completion for the entire Work are _____,**[201__]** and _____, **[201__]**, respectively.

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

1. Submit certified Safety Program and related information
2. Submit copies of applicable permits
3. **[Other]**

OWNER: TOWN OF WOODSIDE

By: _____

Its: _____

END OF DOCUMENT

DOCUMENT 00 6113.13

CONSTRUCTION PERFORMANCE BOND

THIS CONSTRUCTION PERFORMANCE BOND (**Bond**) is dated ***[Month, Day]*****,** 201_ is in the amount of ***[Insert Amount]*** (**Penal Sum**),which is 100% of the Contract Sum and is entered into by and between the parties listed below to ensure the faithful performance of the Contract identified below. This Bond consists of this page and the Bond Terms and Conditions, Paragraphs 1 through 14 attached to this page. Any singular reference to ***[Insert name of Contractor]*** (**Contractor**), ***[Insert name of Surety]*** (**Surety**), Town of Woodside (**Owner**), or other party shall be considered plural where applicable.

CONTRACTOR:

[Insert name of Contractor]

_____
Address

_____
City/State/Zip

SURETY:

[Insert name of Surety]

_____
Principal Place of Business

_____
City/State/Zip

CONSTRUCTION CONTRACT: Agreement for the ***[Town Center Sewer Pump Station Improvements]***, located at the [***2995 Woodside Road***], Woodside, California, dated ***[Month, Day]*****,** 201_, in the amount of ***[Insert Amount]***).

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature:_____

Name: _____

Title: _____

SURETY

Company: (Corp. Seal)

Signature: _____

Name: _____

Title: _____

BOND TERMS AND CONDITIONS

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Owner and the State of California for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.

2. If Contractor completely and properly performs all of its obligations under the Construction Contract, Surety and Contractor shall have no obligation under this Bond.

3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:

3.1 Owner provides Surety with written notice that Owner has declared a Contractor Default under the Construction Contract pursuant to the terms of the Construction Contract; and

3.2 Owner has agreed to pay the Balance of the Contract Sum:

3.2.1 To Surety in accordance with the terms of this Bond and the Construction Contract; or

3.2.2 To a Contractor selected to perform the Construction Contract in accordance with the terms of this Bond and the Construction Contract.

4. When Owner has satisfied the conditions of Paragraph3 above, Surety shall promptly (within 40 Days) and at Surety's expense elect to take one of the following actions:

4.1 Arrange for Contractor, with consent of Owner, to perform and complete the Construction Contract (but Owner may withhold consent, in which case the Surety must elect an option described in Paragraphs 4.2, 4.3 or 4.4 below); or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors or Construction entities; provided, that Surety may not select Contractor as its agent or independent contractor or Contractor without Owner's consent; or

4.3 Undertake to perform and complete the Construction Contract by obtaining bids from qualified contractors or Construction entities acceptable to Owner for a contract for performance and completion of the Construction Contract and, upon determination by Owner of the lowest responsive and responsible Bidder, arrange for a contract to be prepared for execution by Owner and the contractor or Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract; and, if Surety's obligations defined in Paragraph6 below, exceed the Balance of the Contract Sum, then Surety shall pay to Owner the amount of such excess; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor or Contractor, and with reasonable promptness under the circumstances and, after investigation and consultation with Owner, determine in good faith its monetary obligation to Owner under Paragraph6 below, for the performance and completion of the Construction Contract and, as soon as practicable after the amount is determined, tender payment therefor to Owner with full explanation of the payment's calculation. If Owner accepts Surety's tender under this Paragraph 4.4, Owner may still hold Surety liable for future damages then unknown or unliquidated resulting from the Contractor Default, as agreed by Owner and Surety at the time of tender. If Owner disputes the amount of

Surety's tender under this Paragraph 4.4, Owner may exercise all remedies available to it at law to enforce Surety's liability under Paragraphs6 and7 below.

5. At all times Owner shall be entitled to enforce any remedy available to Owner at law or under the Construction Contract including, without limitation, and by way of example only, rights to perform work, protect Work, mitigate damages, advance critical Work to mitigate schedule delay, and coordinate Work with other consultants or contractors.

6. If Surety elects to act under Paragraphs 4.1, 4.2 or 4.3 above, within the time period provided in Paragraph 4, above, and complies with its obligations under this Bond, Surety's obligations under this Bond are commensurate with Contractor's Construction Contract obligations. Surety's obligations include, but are not limited to:

6.1 Contractor's obligations to complete the Construction Contract and correct Defective Work;

6.2 Contractor's obligations to pay liquidated damages; and

6.3 To the extent otherwise required of Contractor under the Construction Contract, Contractor's obligations to pay additional legal, design professional, and other costs not included within liquidated damages resulting from Contractor Default (but excluding attorney's fees incurred to enforce this Bond).

7. If Surety does not elect to act under Paragraphs 4.1, 4.2, 4.3, or 4.4, above, within the time period provided in Paragraph 4, above, or comply with its obligations under this Bond, then Surety shall be deemed to be in default on this Bond ten Days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond. Such Surety default shall be independent of the Contractor Default. To the extent Surety's independent default causes Owner to suffer damages including, but not limited to, delay damages, which are different from, or in addition to (but not duplicative of) damages which Owner is entitled to receive under the Construction Contract, Surety shall also be liable for such damages. In the event any Surety obligation following its independent default is inconsistent or conflicts with California Civil Code Section 2809, or any other law which either prohibits, restricts, limits or modifies in any way any obligation of a surety which is larger in amount or in any other respect more burdensome than that of the principal, Surety hereby waives the provisions of such laws to that extent.

8. If Surety elects to act under Paragraphs 4.1, 4.3 or 4.4 above, within the time period provided in Paragraph 4, above, and complies with all obligations under this Bond, Surety's monetary obligation under this Bond is limited to the Penal Sum.

9. No right of action shall accrue on this Bond to any person or entity other than Owner or its successors or assigns.

10. Surety hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, design agreements, purchase orders and other obligations, including changes of time, and of any Owner action in accordance with Paragraph 5 above. Surety consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, Modification, deletion, or addition to the Contract Documents, or of the Work (including services) required thereunder, or any Owner action in accordance with Paragraph5 above shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond, unless such action is an Owner Default.

11. Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction where a proceeding is pending between Owner and Contractor regarding the Construction Contract, or in the courts of the County of San Mateo, or in a court of competent

jurisdiction in the location in which the Work is located. Communications from Owner to Surety under Paragraph 3.1 above shall be deemed to include the necessary agreements under Paragraph 3.2 above unless expressly stated otherwise.

12. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to Owner shall be mailed or delivered as provided in Document 00 5200 (Agreement). Actual receipt of notice by Surety, Owner or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.

13. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted here from and provisions conforming to such statutory requirement shall be deemed incorporated herein.

14. Definitions

14.1 Balance of the Contract Sum: The total amount payable by Owner to Contractor pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved Modifications to the Construction Contract**.**

14.2 Construction Contract: The agreement between Owner and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.

14.3 Contractor Default: Material failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract, limited to “default” or any other condition allowing a termination for cause as provided in Document 00 7200 (General Conditions).

14.4 Owner Default: Material failure of Owner, which has neither been remedied nor waived, to pay Contractor progress payments due under the Construction Contract or to perform other material terms of the Construction Contract, if such failure is the cause of the asserted Contractor Default and is sufficient to justify Contractor termination of the Construction Contract.

END OF DOCUMENT

DOCUMENT 00 6113.16

CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

1.01 THAT WHEREAS, **TOWN OF WOODSIDE** (**Owner**) has awarded to **(Name of Contractor)** _____ as Principal, Contract Number _____ dated the _____ day of _____, 20___ (the **Contract**), titled THE _____ PROJECT in the amount of $_____, which Contract is by this reference made a part hereof, for the work of the following Contract:

(**Contract Work** includes all labor, materials, tool and equipment necessary for furnishing and installing approximately 28 LF of 6" PVC SDR26, 66 LF of 8" PVC SDR26, 24 LF of 12" PVC SDR26 gravity sanitary sewer, and 96 LF of 4" DIP sanitary sewer force main; a 26-foot deep, 72" (6') diameter precast wastewater wet well with two (2)-Flygt submersible pumps; a new System Control and Data Acquisition (SCADA) equipment ; a new electrical control cabinet and a new 40kW diesel generator with sound enclosure subbase fuel tank; a 11-foot deep, 48" diameter inside sanitary sewer drop manhole with pour-in-place base, and CIM1000 lined; a timber lagging retaining wall; a new 1" copper water service line; a new asphalt concrete pavement; rehabilitating existing wet well; and abandoning sanitary sewer mains and manholes, complete in place, including but not limited to excavation of trenches, laying pipe materials and installation of structures, backfill trenches, pavement removal and new surfacing and other pertinent work as necessary to construct the project as shown on the approved plans and specified in the project specifications. All work for **Town Center Sewer Pump Station Improvements** shall be completed before October 27, 2017 in accordance with contract requirements, and project completion from the date when a notice to proceed to be issue on or before April 5, 2017.

1.02 AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

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

1.04 THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its executors, administrators, successors, or assigns approved by Owner, or its subcontractors shall fail to pay any of the persons named in California Civil Code Section 9100, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, plus reasonable attorneys' fees, otherwise the above obligation shall become and be null and void.

1.05 This bond shall inure to the benefit of any of the persons named in California Civil Code Section 9100, as to give a right of action to such persons or their assigns in any suit brought upon this

bond. The intent of this bond is to comply with the California Mechanic's Lien Law.

1.06 Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

1.07 Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing Owner's rights against the other.

1.08 Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

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

CONTRACTOR AS PRINCIPAL	**SURETY**
Company: (Corp. Seal)	Company: (Corp. Seal)
_____	_____
Signature	Signature
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Street Address	Street Address
_____	_____
City, State, Zip Code	City, State, Zip Code

END OF DOCUMENT

DOCUMENT 00 6325

SUBSTITUTION REQUEST FORM

To: **TOWN OF WOODSIDE, Owner**

[Phone Number (650) 851-6790

PROJECT: TOWN CENTER SEWER PUMP STATION IMPROVEMENTS

Contractor:

Substitution Request By	Firm:

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

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

Section / Drawing	**Article**	**Specified Item**
Proposed Substitution:		

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

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

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

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

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

Submitted by:_____ Signature: _____

Firm:_____ Date: _____

Address:_____ Phone/ Fax: _____

Remarks:_____

Consultant Response:	**Owner Representative Response:**
o Accepted	o Accepted
o Not Accepted	o Not Accepted
o Accepted As Noted	o Accepted As Noted
o Received Too Late	o Received Too Late
Remarks:_____	**Remarks:**_____
_____	_____
By:_____	**By:**_____

END OF DOCUMENT

DOCUMENT 00 6530

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS
[Public Contract Code Section 7100]

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS (**Agreement and Release**), made and entered into this **[date]** day of **[Month]**, **[201___]**, by and between **TOWN OF WOODSIDE**(**Owner**), and **[Enter Name of Contractor]** (**Contractor**), whose place of business is at **[Enter Address of Contractor]**.

RECITALS

A. Owner and Contractor entered into Contract (the "**Contract**") for construction of Owner **Town Center Sewer Pump Station Improvements** located at **2955 Woodside Road**, **Woodside,** California.

B. The Work under the Contract has been completed.

AGREEMENT

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

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

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

2. Subject to the provisions of this Agreement and Release, Owner will forthwith pay to Contractor the sum of [_____ Dollars and _____ Cents ($_____)] under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with Owner as of the date of such payment.

3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against Owner arising from the Contract, except for the claims described in Paragraph 4 of this Document 00 6530. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against Owner, and all if its agents, employees, consultants, inspectors, representatives, assignees and transferees, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in Paragraph 6 of this Document 00 6530.

4. The following claims submitted under Document 00 7200 (General Conditions), Article 12, are disputed (**Disputed Claims**) and are specifically excluded from the operation of this Agreement and Release.

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

CLAIM NO.	DATE SUBMITTED	DESCRIPTION OF CLAIM	AMOUNT OF CLAIM

5. Consistent with California Public Contract Code Section 7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 of this Document 00 6530, Contractor hereby releases and forever discharges Owner, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

6. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.

7. Contractor shall immediately defend, indemnify and hold harmless Owner, any of the Owner's Representatives, Project Manager, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530.

8. Contractor hereby waives the provisions of California Civil Code Section 1542, which provide as follows:

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

9. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal or other law, ruling, or regulation, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.

11. All rights of Owner shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

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

OWNER: TOWN OF WOODSIDE

By: _____
Signature

Name: _____
Print

Its: _____
Title

ATTEST:

_____
Secretary

_____
Print

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

[IF REQUIRED] REVIEWED AS TO FORM:

Dated: _____, [201__]

By: _____
Counsel for Owner

Name: _____
Print

END OF DOCUMENT

DOCUMENT 00 6536

GUARANTY

TO: The **TOWN OF WOODSIDE** (**Owner**), for construction of the TOWN CENTER SEWER PUMP STATION IMPROVEMENTS PROJECT, located at 2995 Woodside Road, Woodside, California.

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

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

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

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

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

1.05 This Guaranty is in addition to any other Contractor warranties contained in the Contract Documents, and not in lieu of, any and all other Contractor liability imposed under the Contract Documents or at law. In the event of any conflict or inconsistency between the terms of this Guaranty and any Contractor warranty or obligation Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the greater protection to Owner.

Date: _____, 20___

_____
Contractor's name

By: _____

Signature

_____
Print Name

_____
Title

_____
Street Address

_____
City, State, Zip code

END OF DOCUMENT

DOCUMENT 00 7200

GENERAL CONDITIONS

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GENERAL CONDITIONS

ARTICLE 1 - INTERPRETATION OF CONTRACT DOCUMENTS

1.01 Interpretation Of Documents

A. Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. Individual Contract Documents subdivide at first level into Articles, and then into paragraphs.

1.02 Order Of Precedence Of Documents

A. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:

1. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
2. Agreement Forms (Document 00 5200 and other 5000 and 6000 series Documents), and terms and conditions referenced therein;
3. General Conditions (Document 00 7200);
4. Technical Specifications/Special Provision
5. Drawings
6. State Specifications
7. State Standard Plans
8. Written words over figures, unless obviously incorrect;
9. Figured dimensions over scaled dimensions;
10. Large-scale Drawings over small-scale Drawings.

B. Any conflict between Drawings and Technical Specifications will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

C. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

D. All Technical Specifications included in the Project manual shall be included within the Contract Documents unless identified otherwise.

ARTICLE 2 - PRE-BID INVESTIGATIONS

2.01 Pre-Bid Investigations Required

A. Prior to and as a condition of submitting a Bid and executing Document 00 5200 (Agreement), Contractor shall make reasonable efforts to investigate fully the Work of the Contract. Contractor shall visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions.

B. Contractor's investigation shall include, without limitation, requesting and thoroughly examining of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, made available by Owner for contracting purposes or during Contractor's pre-bid investigations, of existing above ground and (to the extent applicable) below ground conditions (together, **Existing Conditions Data**), including, as applicable, Underground Facilities, geotechnical data, as-built data, utility surveys, record documents of all types, hazardous materials surveys, or similar materials which may appear or be referenced in the Project Manual or the in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.

C. Contractor's investigations shall consider fully the fact that Existing Conditions Data is in many cases based on information furnished to Owner by others (e.g., the prior owner or builders), and

that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor shall also: (i.) provide Owner with prompt written notice of all conflicts, errors, ambiguities, or discrepancies of any type, that it discovered in or among the Contract Documents and the Existing Conditions Data, and (ii.) subject to Owner's approval, conduct any such additional or supplementary examinations, investigations, explorations, tests, studies and data compilations, concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which Contractor may deem necessary in order to perform and furnish the Work in accordance with the terms and conditions of Contract Documents.

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

2.02 Limited Reliance Permitted On Owner's Existing Conditions Data

A. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied by Owner, such information has been compiled in good faith, however, Owner does not expressly or impliedly warrant or represent that such information is correctly shown or indicated, or otherwise complete for construction purposes. Contractor must independently verify such information as part of its pre-bid investigations, and where conditions are not reasonably verifiable or discrepancies are identified, bring such matters to Owner's attention through written question issued during the bid period. In executing Document 00 5200 (Agreement), Contractor shall rely on the results of its own independent investigation and shall not rely on Owner-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.

B. Regarding subsurface conditions other than Underground Facilities shown on the Contract Documents or otherwise supplied by Owner, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. Owner is not responsible for the completeness of any subsurface condition information, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, Owner is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

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

A. As part of its pre-bid investigations for Projects involving excavation and/or relocation of existing utilities, Contractor shall make reasonable efforts to verify information regarding Underground Facilities, including but not limited to, requesting additional information or verification of information as necessary.

B. Because of the nature and location of Owner and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. Contractor shall, therefore, take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site). Contractor shall also consider local underground conditions and typical practices for Underground Facilities, either through its own

direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

ARTICLE 3 - SUBCONTRACTORS

3.01 Subcontractor Listing Law

A. Contractor shall comply with the Subcontractor Listing law, Public Contract Code Section 4101, et seq. Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid except as may be allowed by law.

B. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without Owner's written approval. At Owner's request, Contractor shall provide Owner with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

3.02 Subcontracts

A. Subcontract agreements shall preserve and protect the rights of Owner under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written agreement (i) to be bound to the terms of Contract Documents and (ii) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward Owner under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

B. Contractor shall provide for the assignment to Owner of all rights any Subcontractor (of any tier) may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents. Subcontracts shall provide and acknowledge Owner as an intended third-party beneficiary of each subcontract and supply contract (of any tier).

ARTICLE 4 - DRAWINGS AND SPECIFICATIONS

4.01 Intent Of Drawings And Specifications

A. Contractor shall interpret words or phrases used to describe Work (including services), materials, or equipment that have well-known technical or construction industry or trade meaning in accordance with that meaning. Drawings' intent specifically includes the intent to depict construction that complies with all applicable laws, codes and standards.

B. As part of the **"Work,"** Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, Shop Drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

C. Contractor shall perform reasonably implied parts of Work as **"incidental work"** although absent from Drawings and Specifications. Incidental work includes any work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental work includes any work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents. Contractor shall perform incidental work without extra cost to Owner. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of incidental work shall be included in price Bid and Contract Sum.

4.02 Checking Of Drawings and Specifications

A. Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent figures shown in the Contract Documents and all applicable field measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not scale measurements. Contractor shall promptly report to Owner, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from Owner before proceeding with any Work affected thereby. Contractor shall provide Owner with a follow-up correspondence every ten Days until it receives a satisfactory interpretation or clarification.

4.03 Interpretation Of Drawings And Specifications

A. A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by Owner. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.

B. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in Drawings and Specifications, or should Contractor have any questions or requests relating to Drawings or Specifications, Contractor shall refer the matter to Owner, in writing, with a copy to the Architect/Engineer. Owner will issue with reasonable promptness written responses, clarifications or interpretations as Owner may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give Owner prompt written notice. If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with Owner's response, clarification, or interpretation and may make a written claim for the adjustment as provided in Article 12.

C. The following general specifications shall apply wherever in the Specifications, or in any directions given by Owner in accordance with or supplementing Specifications, it is provided that Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed specifications are shown. Materials or manufactured articles shall be of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried in stock, the materials or manufactured articles shall conform to industry standards for first class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited herein, for first class work of the kind required. Contractor shall specify in writing to Owner, at least 10 Business Days prior to furnishing such materials or performing such Work, the materials to be used or Work to be performed under this Paragraph.

4.04 Use Of Drawings And Specifications.

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

ARTICLE 5 - COMMENCEMENT OF THE WORK

5.01 Submission Of Required Schedules

A. Contractor shall submit to Owner in draft for review and discussion at the Preconstruction Conference, and in final prior to the first payment application, the following schedules:

1. Schedule of Values
2. Progress Schedule, and
3. Schedule of Submittals.

B. No progress payment shall be due or owing to Contractor until such schedules are submitted to and acceptable to Owner and/or Architect/Engineer as meeting the requirements of the Contract Documents. In Owner's sole discretion, Owner may elect to instead withhold a portion of any progress payment for unacceptable compliance with contract requirements for such schedules.

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

5.02 Commencement Date Of Contract Time

A. The Contract Time will commence to run on the 60th Day after the issuance of the Notice of Award or, if a Notice to Proceed is given, on the date indicated in the Notice to Proceed.

B. Owner may give a Notice to Proceed at any time within 60 Days after the Notice of Award. Contractor shall not do any Work at the Site prior to the date on which the Contract Time commences to run.

ARTICLE 6 - CONTRACTOR'S ORGANIZATION AND EQUIPMENT

6.01 Contractor's Legal Address

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

6.02 Contractor's Superintendents Or Forepersons

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

6.03 Proficiency In English

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

6.04 Contractor's And Subcontractors' Employees

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

6.05 Contractor's Use of The Site

A. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between Owner and any Owner, former Owner or tenant of such land, structure or buildings. Contractor may not occupy Owner-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior approval from Owner.

6.06 Contractor's Site Office

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

ARTICLE 7 - OWNER'S ADMINISTRATION OF WORK

7.01 Owner's Representative(s)

A. Owner's Representative(s) will have limited authority to act on behalf of Owner as set forth in the Contract Documents.

B. Except as otherwise provided in these Contract Documents or subsequently identified in writing by Owner, Owner will issue all communications to Contractor through Owner's Representative, and Contractor shall issue all communications to Owner through Owner's Representative in a written document delivered to Owner.

C. Should any direct communications between Contractor and Owner's consultants, architects or engineers not identified in Article 2 of Document 00 5200 (Agreement) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to Owner.

7.02 Owner's Observation of The Work

A. Work shall be performed under Owner's general observation and administration. Contractor shall comply with Owner's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. Owner's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.

B. Subject to those rights specifically reserved in the Contract Documents, Owner will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing or performance of Work. Owner will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

7.03 Consultant's Observation Of Work

A. Owner may engage one or more of the following to assist in administering the Work: an Architect/Engineer, Project Manager, Construction Manager, or any other independent consultant (collectively for purposes of this Article 7, **Consultant**). If so engaged, Consultant will advise and consult with Owner, but will have authority to act on behalf of Owner only to extent provided in the Contract Documents or as set forth in writing by Owner. Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Consultant will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.

B. Consultant may review Contractor's Submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents.

C. Consultant may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Consultant may recommend to Owner that it disapproves or rejects Work that Consultant believes to be Defective or will not

produce a complete Project that conforms to Contract Documents, or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. Consultant may also recommend to Owner special inspection or testing of Work, whether or not the Work is fabricated, installed, or completed.

D. Consultant may conduct observations or inspections to recommend to Owner the dates that Contractor has achieved Substantial Completion and Final Completion, and will receive and forward to Owner for review written warranties and related documents required by Contract Documents.

7.04 Owner's And Consultant's Exercise Of Contract Responsibilities

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

7.05 Owner's Right of Access To The Work

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

7.06 Owner's Right of Separate Construction

A. Owner may perform with its own forces, construction or operations related to the Project, or the Site during Contractor's operations. Owner may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility Owners perform other work.

B. Contractor shall adjust its schedule and fully coordinate with and shall afford all other contractors, utility districts and Owner (if Owner is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' work, do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work, and shall cooperate with them to facilitate the progress of the Work.

C. To the extent that any part of Contractor's Work is to interface with work performed or installed by other contractors or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to Owner in writing any defect in in-place work that will impede or increase the cost of Contractor's interface unless corrected.

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

8.01 Contractor to Supervise The Work

A. Subject to those rights specifically reserved in the Contract Documents, Contractor shall supervise, direct, have control over, and be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, safety precautions and programs incident thereto, and compliance with laws and regulations applicable to the furnishing or performance of Work.

B. Contractor shall keep on the Site at all times during Work progress a competent resident Superintendent, who shall not be replaced without Owner's express written consent and, if applicable, payment of liquidated damages as required by Document 00 5200 (Agreement). The

Superintendent shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent shall be as binding as if given to or by Contractor.

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

D. Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor.

E. Contractor shall conduct monthly Contractor Safety Committee meetings, and weekly toolbox safety talks.

8.02 Contractor to Maintain Cost Data

A. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide Owner with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide Owner with a copy of such report upon Owner's request.

B. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide Owner with copies for each Day Contractor works on the Project, to be delivered to Owner either the same Day or the following morning before starting work at the Site. Contractor shall take pre-construction and monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.

C. Owner shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including, without limitation, financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. By way of example, Owner shall have the right to inspect and obtain copies of all Contract Documents, planning and design documents, Bid proposal and negotiation documents, cost records and job cost variance reports, design modification proposals, value engineering or other cost reduction proposals, revisions made to the original design, job progress reports, photographs, and as-built drawings maintained by Contractor. Owner and any other applicable governmental entity shall have the right to inspect all information and documents maintained hereunder at any time during the Project and for a period of five years following Final Completion, in accordance with the provisions of the Government Code Section 8546.7. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

8.03 Contractor to Supply Sufficient Workers And Materials

A. Unless otherwise required by Owner under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

B. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified

workers to prosecute the Work as required, then Owner may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as Owner may consider necessary, at no cost to Owner. If Contractor does not comply with the notice within three Business Days of date of service thereof, Owner shall have the right (but not a duty) to provide materials and qualified workers to finish the Work or any affected portion of Work, as Owner may elect. Owner may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate work elements during the time period that Owner exercises this right. Owner will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. Owner will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of Owner from claims of others.

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

8.04 Contractor to Maintain Project Record Documents

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all as-built changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to Owner for reference. Upon completion of the Work, Contractor shall deliver to Owner, the Project Record Documents, Samples and Shop Drawings and as-built drawings.

B. Throughout Contractor's performance of the Work of the Project, Contractor shall maintain construction records to include: shop drawings; product data/material data sheets; samples; submittal; purchases; materials; equipment; inspections; applicable handbooks; applicable codes and standards; maintenance and operating manuals and instructions; RFI Log; Submittal Log; other related documents and revisions which arise out of the Construction Contracts. Contractor shall maintain records of principal building layout lines, elevations for the bottom of footings, floor levels, and key site elevations (certified by a qualified surveyor or professional engineer). Contractor shall make all records available to Owner. At the completion of the Project, Contractor shall deliver all such records to the Owner to have a complete set of record as-built drawings.

8.05 Contractor to Not Disrupt Owner Operation

A. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt Owner operations including, without limitation, parking, utilities (electricity, gas, water), noise, access by employees and administration, access by vendors, physicians, patients and any other person or entity using Owner facilities or doing business with Owner. Contractor shall produce and supply coordination plans and requests to Owner, following Owner procedures, for all necessary interference of construction with Owner, which Owner will reasonably cooperate with.

8.06 Contractor to Provide Temporary Facilities and Controls

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

ARTICLE 9 - WARRANTY, GUARANTY, AND INSPECTION OF WORK

9.01 Warranty and Guaranty

A. General Representations and Warranties: Contractor represents and warrants that it is and will be at all times fully qualified and capable of performing every Phase of the Work and to complete Work in accordance with the terms of Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of Contract Documents. Contractor warrants that Work including , without limitation, each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by Contract Documents.

B. Extended Warranties: Any warranty exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply Owner with all warranty and guarantee documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.

C. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this Paragraph are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, without limitation, Project completion. Contractor covenants, warrants and represents to Owner that:

1. To Contractor's knowledge after due inquiry, no lead or Asbestos-containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or Asbestos-containing materials were discovered, Contractor made immediate written disclosure to Owner.
2. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor's construction thereof.
3. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to Owner.
4. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any Work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide Owner with copies thereof.

9.02 Inspection of Work

A. Work and materials, and manufacture and preparation of materials, from beginning of construction until Final Completion and acceptance of Work, shall be subject to inspection and rejection by Owner, its agents, representatives or independent contractors retained by Owner to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's

Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, Owner shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.

B. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, Samples or test specimens of all materials to be used or offered for use in connection with Work. Contractor shall prepare Samples or test specimens at its expense and furnish them to Owner. Contractor shall submit all Samples in ample time to enable Owner to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

C. Contractor shall give Owner timely notice of readiness of Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

D. If applicable laws or regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish Owner with the required certificates of inspection, or approval. Owner will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

E. If Contractor covers any Work, or the work of others, prior to any required inspection, test or approval without written approval of Owner, Contractor shall uncover the Work at Owner's request. Contractor shall bear the expense of uncovering Work and replacing Work. In any case where Contractor covers Work contrary to Owner's request, Contractor shall uncover Work for Owner's observation or inspection at Owner's request. Contractor shall bear the cost of uncovering Work.

F. Whenever required by Owner, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory, Owner, in manner herein prescribed for paying for alterations, Modifications, and extra Work, except as otherwise herein specified, will pay for examination.

G. Inspection of the Work by or on behalf of Owner, or Owner's failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Contractor shall have an absolute duty, in the absence of a written Change Order signed by Owner, to perform Work in conformance with the Contract Documents and to immediately correct Defective Work immediately upon Contractor's knowledge.

H. Any inspection, evaluation, or test performed by or on behalf of Owner relating to the Work is solely for the benefit of Owner, and shall not be relied upon by Contractor. Contractor shall not be relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by Owner, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

9.03 Correction of Defective Work

A. Owner may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Also, if Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, Owner may

direct Contractor to perform the Work in accordance with the Contract Documents, correct or replace any such Defective Work, or stop any portion of Work.

B. Owner may correct and remedy the Defective Work or perform any other work, corrective or otherwise, if, after five Days' written notice to Contractor, Contractor fails to correct Defective Work or to remove and replace rejected Work; or provide a plan for correction of Defective Work acceptable to Owner; or perform Work in accordance with Contract Documents. In connection with such corrective and remedial action, Owner may exclude Contractor from all or part of the Site; take possession of all or part of Work and suspend Contractor's Work related thereto; take possession of all or part of Contractor's tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, its representatives, agents, employees, and other contractors and consultants' access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by Owner in exercising rights and remedies under this Paragraph. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Owner may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from monies due Contractor, all such claims, costs, losses and damages caused by or resulting from exercising its rights and remedies. If Contractor disagrees with Owner's calculations, it may make a claim as provided in Article 12 of this Document 00 7200.

D. These Owner rights and remedies are entirely discretionary on the part of Owner, and shall not give rise to any duty on the part of Owner to exercise the rights for the benefit of Contractor or any other party. Owner's rights under this Paragraph shall be in addition to any other rights it may have under the Contract Documents or by law.

9.04 Acceptance of Defective Work

A. Owner may in its sole discretion elect to accept Defective Work. Contractor shall pay all claims, costs, losses and damages attributable to Owner's evaluation of and determination to accept such Defective Work. If Owner accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Owner may deduct from monies due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with Owner's calculations, Contractor may make a claim as provided in Article 12 of this Document 00 7200. If Owner accepts any Defective Work after final payment, Contractor shall pay to Owner, an appropriate amount as determined by Owner.

9.05 Rights Upon Inspection, Correction Or Acceptance

A. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by Owner of its rights and remedies under this Article. Where Owner exercises its rights under this Article, it retains and may still exercise all other rights it has by law or under the Contract Documents including, without limitation, the right to terminate Contractor's right to proceed with the Work under the Contract Documents for cause and/or make a claim or back charge where a Change Order cannot be agreed upon.

B. Observation or inspection by Owner or its authorized agents or representatives shall not relieve Contractor of its obligation to have furnished material and workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments, final payment or otherwise shall not operate to waive Owner's right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of any defective Work paid therefor. Contractor's obligation to complete the Work in accordance with Contract Documents shall be absolute, unless Owner agrees otherwise in writing.

9.06 Proof Of Compliance Of Contract Provisions

A. In order that Owner may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of Work and materials, Contractor shall at any time, when requested, submit to Owner properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

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

9.07 Correction Period And Project Warranty Period:

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

B. In special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Final Acceptance of all the Work, the correction period for that part of Work or that item may start to run from an earlier date if so provided by Change Order.

C. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been corrected, removed, or replaced under this Paragraph after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

9.08 No Waiver

A. Neither recordation of Final Acceptance nor final certificate for payment nor provision of the Contract nor partial or entire use or occupancy of premises by Owner shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.

B. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to Owner, Owner shall have right to operate and use materials or equipment until said materials and equipment can, without damage to Owner, be taken out of service for correction or replacement. Period of use of Defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.

C. Nothing in the Contract Documents shall be construed to limit, relieve, or release Contractor's, Subcontractors', and equipment suppliers' liability to Owner for damages sustained as result of latent defects in materials or equipment caused by negligence of Contractor, its agents, suppliers, employees, or Subcontractors.

ARTICLE 10 - MODIFICATIONS OF CONTRACT DOCUMENTS

10.01 Owner's Right To Direct Changed Work.

A. Owner may, without notice to the sureties and without invalidating the Contract, make changes in the Work (**Changed Work**) including, without limitation: alterations, deviations, additions to, or deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, reduce or otherwise change the Contract Time; delete any item or portion of the Work; and require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless specifically provided otherwise at the time the change is ordered. In the case of any ordered extra Work, Owner reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such Owner-furnished labor, materials, and equipment.

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

10.02 Required Documentation For Changed Work

A. Changes affecting the Contract Time or Contract Sum of the Work shall be set forth in a written Change Order or Change Directive that shall specify:

1. The Work performed in connection with the change to be made;
2. The amount of the adjustment of the Contract Sum, if any, and the basis for compensation for the Work ordered; and
3. The extent of the adjustment in the Contract Time, if any.

B. A Change Order or Change Directive will become effective when signed by Owner, notwithstanding that Contractor has not signed it. A Change Order will become effective without Contractor's signature, provided Owner indicates same thereon (by indicating it as a "unilateral change order").

C. All changes in any plans and specifications approved by any authority with jurisdiction may also require addenda or change orders approved by that authority.

D. Where Owner requests, a performance bond rider covering the changed Work must be executed and delivered to Owner before proceeding with the changed Work or shortly in time thereafter.

10.03 Procedures And Pricing Of Changed Work

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

ARTICLE 11 - TIME ALLOWANCES

11.01 Time Allowances

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

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

C. Time extensions will not be granted unless substantiated by the Critical Path Method **(CPM**) Schedule, and then not until the CPM project float becomes zero. If Contractor fails to submit a TIE within the required time period, then Contractor shall be deemed to have agreed that there is no time impact and that Contractor has irrevocably waived its rights to any additional Contract Time.

11.02 Excusable Delay And Inexcusable Delay Defined.

A. Excusable Delay. Subject to the provisions on Notice of Delay below, Contract Time may be adjusted in an amount equal to the time lost due to:

1. Changes in the Work ordered by Owner (**Changes**");
2. Acts or neglect by Owner, Architect, any Owner Representative, utility owners or other contractors performing other work, not permitted or provided for in the Contract Documents, provided that Contractor has performed its responsibilities under the Contract Documents (including, without limitation, pre-bid investigations) (**Acts or Neglect**); or
3. Fires, floods, epidemics, abnormal weather conditions beyond the parameters otherwise set forth in this Article, earthquakes, civil or labor disturbances, or acts of God (together, "force majeure events"), provided damages resulting therefrom are not the result of Contractor's failure to protect the Work as required by Contract Documents (**Force Majeure**).

B. Inexcusable Delay. Contract Time shall not be extended for any period of time where Contractor (and/or any Subcontractor) is delayed or prevented from completing any part of the Work due to a cause that is within Contractor's risk or responsibility under the Contract Documents. Delays attributable to or within the control of a Subcontractor, or its subcontractors, or supplier, are deemed delays within the control of Contractor.

11.03 Notice Of Delay

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

11.04 Compensable Time Extensions

A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Sum in addition to Contract Time for:

1. Excusable delay caused solely by Changes in the Work ordered by Owner, as provided above, and/or
2. Excusable delay caused solely by Acts or Neglect by Owner or other person, as provided above.

11.05 Non-Compensable Time Extensions

A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Time only, without adjustment in Contract Sum, for

1. Periods of excusable delay caused solely by weather or Force Majeure events as provided above in this Article, or
2. Periods of concurrent delay, where delay results from two or more causes, one of which is compensable (resulting from Changes or Acts or Neglect as set forth above in this Article), and the other of which is non-compensable or unexcusable, such as: acts or neglect of Contractor, Subcontractors or others for whom Contractor is responsible; other acts, omissions and conditions which would not entitle Contractor to adjustment in Contract Time; adverse weather; and/or actions of Force Majeure as provided above in this Article.

11.06 Adverse Weather

A. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds the parameters listed or referenced immediately below in this subparagraph and Contractor proves that adverse weather actually caused delays to work on the critical path. Contractor shall give written notice of intent to claim an adverse weather day within one Day of the adverse weather day occurring.

B. Claims for extension of time for rain delay will not be granted unless the number of days work is prevented by rain exceeds 100% of the historical average number of rain days for the period of the Contract Time, based on the records of the National Oceanic & Atmospheric Administration (**NOAA**) weather station closest to the Project Site, as measured and reported by NOAA. (For example, for California, Oregon and Washington, these figures are contained in the ">=0.10 inch" column at the applicable weather station's "General Climate Summary Table" for "Precipitation" at http://www.wrcc.dri.edu/climate-summaries/), pro-rated in the individual month Contractor starts and finishes Work. Delays due to adverse weather conditions will not be allowed for weather conditions that fall within these parameters.

C. In order to qualify as an adverse weather delay with respect to the foregoing parameters, (i.) daily rainfall must exceed 0.1 inch, and/or (ii.) daily snowfall must exceed 1.0 inch or more, at the NOAA station located closest to the Project site, as measured and reported by NOAA. Notwithstanding these allowances, Contractor shall at all times employ all available mitigation measures to enable Work to continue, Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, lime treatment, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for Owner to not grant a time extension due to adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.

D. Contractor shall include the foregoing precipitation parameters as a monthly activity in its progress schedule. As Work on the critical path is affected by precipitation, Contractor shall notify Owner and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float available to either Owner or Contractor.

E. Adverse weather delay for precipitation shall be recognized for the actual period of time Contractor proves it was delayed by precipitation exceeding the specified parameters. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor's progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to Owner's satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.

F. During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall employ best practices to protect the Work, manage the construction site and rainwater during inclement weather. Persons performing the Work shall examine surfaces to receive their Work and shall report in writing to Contractor, with copy to Owner representative and the Architect conditions detrimental to the Work. Failure to examine and report discrepancies makes the Contractor responsible, at no increase in Contract Sum, for corrections Owner may require. Commencement of Work constitutes acceptance of surface.

11.07 Liquidated Damages

A. Time is of the essence. Execution of Contract Documents by Contractor shall constitute its acknowledgement that Owner will actually sustain damages in the form of Contract administration expenses (such as Project management and consultant expenses) in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion plus extensions of time allowed pursuant to provisions hereof.

B. Contractor and Owner agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of such actual damages incurred by Owner because of a delay in completion of all or any part of the Work. Contractor and Owner agree that specified measures of liquidated damages shall be presumed to be the amount of such damages actually sustained by Owner, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.

C. Liquidated damages for delay shall cover administrative, overhead, interest on bonds, and general loss of public use damages suffered by Owner as a result of delay. Liquidated damages shall not cover the cost of completion of the Work, damages resulting from Defective Work, lost revenues or costs of substitute facilities, or damages suffered by others who then seek to recover

their damages from Owner (for example, delay claims of other contractors, subcontractors, tenants, or other third-parties), and defense costs thereof. Owner may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages.

D. Contractor and Owner agree that the Key Personnel listed in Contractor's Statement of Qualifications (Document 00 4513) were a material factor in Owner's assessment of Contractor's experience and the adequacy of Contactor's supervisory personnel. Accordingly, Contractor and Owner agree that Contractor shall not remove, reassign or make changes to any of the Key Personnel without Owner's prior written approval. In the event that any Key Personnel leaves the Project, is reassigned and/or is removed and replaced by Contractor before Project Final Completion, for any reason whatsoever, Contractor agrees to pay Owner liquidated damages as set forth in the Agreement (Document 00 5200), unless Contractor can demonstrate to Owner's satisfaction that the Key Personnel were reassigned and/or removed and replaced for reasons beyond Contractor's control.

ARTICLE 12 - CLAIMS BY CONTRACTOR

12.01 Obligation to File Claims for Disputed Work

A. Should it appear to Contractor that the Work to be performed or any of the matters relative to the Contract Documents are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of the Contract Documents, or should any dispute arise regarding the true value of any work performed, work omitted, extra work that the Contractor may be required to perform, time extensions, payment to the Contractor during performance of this Contract, performance of the Contract, and/or compliance with Contract procedures, or should Contractor otherwise seek extra time or compensation FOR ANY REASON WHATSOEVER, then Contractor shall first follow procedures set forth in the Contract Documents (including, without limitation, Paragraphs 11.03, 11.04, 13.03 and 13.04 of this Document 00 7200 and Section 01 2600.) If a dispute remains, then Contractor shall give written notice to Owner that expressly invokes this Article 12. Owner shall decide the issue in writing within 15 days; and Owner's written decision shall be final and conclusive. If Contractor disagrees with Owner's decision, or if Contractor contends that Owner failed to provide a decision timely, then Contractor's SOLE AND EXCLUSIVE REMEDY is to promptly file a written claim setting forth Contractor's position as required herein.

12.02 Form And Contents Of Claim

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

12.03 Administration During/After Claim Submission

A. Owner may render a final determination based on the Claim or may in its discretion conduct an administrative hearing on Contractor's claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further evidence or analysis requested by Owner prior to rendering a final determination. Should Owner take no action on the Claim within 45 days of submission, it shall be deemed denied.

B. Notwithstanding and pending the resolution of any claim or dispute, Contractor shall diligently prosecute the disputed work to final completion in accordance with Owner's determination.

C. After their submission, claims less than $375,000 shall also be subject to the Local Agency Disputes Act.

12.04 Compliance

A. The provisions of this Article 12 constitute a non-judicial claim settlement procedure that, pursuant to Government Code Section 930.2, shall constitute a condition precedent to submission of a valid Government Code Claim under the Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a claim. Any claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the claims procedure herein and the previous dispositions under Paragraph 12.03 above of the claims asserted. No suit may be brought against Owner arising out of or in connection with the Project unless and until Contractor presents to Owner a statutory Government Code Claim, in accordance with Government Code Sections 910, *et seq*. Pursuant to Government Code Section 930.2, the one-year period in Government Code section 911.2 shall be reduced to 150 days from either accrual of the cause of action, substantial completion or termination of the contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.

B. Failure to submit and administer claims as required in Article 12 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) or issue(s) not raised in a timely protest and timely claim submitted under this Article 12 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

C. Owner shall not be deemed to waive any provision under this Article 12, if at Owner's sole discretion, a claim is administered in a manner not in accord with this Article 12. Waivers or modifications of this Article 12 may only be made a signed change order approved as to form by legal counsel for both Owner and Contractor; oral or implied modifications shall be ineffective.

ARTICLE 13 - UNDERGROUND CONDITIONS

13.01 Contractor To Locate Underground Facilities.

A. During construction, Contractor shall comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part: "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two working days, but no more than 14 calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."

B. Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching work, Contractor shall provide Owner with copies of all USA records secured by Contractor. Contractor shall advise Owner of any conflict between information provided in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents.

C. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify Owner and the utility owner, in writing, of its discovery.

13.02 Contractor To Protect Underground Facilities.

A. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such Underground Facilities in service where appropriate; shall repair any damage to them caused by the Work; and shall incorporate them into the Work, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations.

B. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground Facilities that are to remain in service and other significant known underground installations indicated by the Underground Facilities Data. Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, all such utilities or installations that are to remain and that are subject to damage. If additional utilities whose locations are unknown are discovered, Contractor shall immediately report to Owner for disposition of the same. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Document 00 7200.

C. If during construction, an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by Owner for bidding or in information on file at USA or otherwise reasonably available to Contractor, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven Days), and prior to performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and give written notice to that owner and to Owner. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, without limitation, information made available for bidding and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, without limitation, and by way of example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordination of the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

E. Consistent with Government Code Section 4215, as between Owner and Contractor, Owner will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or information made available for bidding. Owner will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or information made available for bidding with reasonable accuracy, and equipment on the Project necessarily idled during such Work. Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay was caused by the failure of Owner or the utility to provide for removal or relocation of such utility facilities.

13.03 Concealed Or Unknown Conditions

A. If either of the following conditions is encountered at Site when digging trenches or other excavations that extend deeper than four feet below the surface, Contractor shall give a written Notice of Differing Site Conditions to Owner promptly before conditions are disturbed, except in an emergency as set forth in this Document 00 7200, and in no event later than seven Days after first observance of:

1. Subsurface or Latent physical conditions which differ materially from those indicated in the Contract Documents; or

2. Unknown physical conditions of an unusual nature or which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

B. In response to Contractor's Notice of Differing Site Conditions under this Paragraph, Owner will investigate the identified conditions, and if they differ materially and cause increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, Owner will negotiate the appropriate change order following the procedures set forth in the Contract Documents. If Owner determines that physical conditions at the Site are not Latent or are not materially different from those indicated in Contract Documents or that no change in terms of the Contract Documents is justified, Owner will so notify Contractor in writing, stating reasons (with Contractor retaining its rights under Article 12 of this Document 00 7200.)

C. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed Latent or materially different Site conditions (whether above or below grade) if Contractor knew or should have known of the existence of such conditions at the time Contractor submitted its Bid, failed to give proper notice, or relied upon information, conclusions, opinions or deductions of the kind that the Contract Documents preclude reliance upon.

D. Regarding Underground Facilities, Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that is owned and was built by Owner only where the Underground Facility:

1. Was not shown or indicated in the Contract Documents or in the information supplied for bidding purposes or in information on file at USA; and
2. Contractor did not know of it; and
3. Contractor could not reasonably have been expected to be aware of it or to have anticipated it from the information available. (For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, then an increase in the Contract Sum or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated in the Contract Documents, in the information supplied to Contractor for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor.)

E. Contractor shall bear the risk that Underground Facilities not owned or built by Owner may differ in nature or locations shown in information made available by Owner for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor. Underground Facilities are inherent in construction involving digging of trenches or other excavations on Owner's Project, and Contractor is to apply its skill and industry to verify the information available.

F. Contractor's compensation for claimed Latent or materially different Site conditions shall be limited to the actual, reasonable, incremental increase in cost of that portion of the Work, resulting from the claimed Latent or materially different Site conditions. Such calculation shall take into account the estimated value of that portion of the Work and the actual value of that portion of the Work, using for guidance Contractor's or its subcontractor's bid amount and actual amounts incurred for that portion of the Work and the reasonable expectation (if any) of differing or difficult site conditions in the Work area based on the available records and locale of the Work. For example, if Contractor excavates in an area unexpected, then such costs would be recoverable entirely; while if Contractor extends an existing excavation, then such costs would be recoverable if the resulting excavation costs in that work area exceeded the reasonable expectations therefore.

13.04 Notice Of Hazardous Waste Or Materials Conditions

A. Contractor shall give a written Notice of Hazardous Materials Condition to Owner promptly, before any of the following conditions are disturbed (except in an emergency as set forth in this Document 00 7200), and in no event later than 24 hours after first observance of any:

1. Material that Contractor believes may be hazardous waste or hazardous material, as defined in Section 25117 of the Health and Safety Code (including, without limitation,

Asbestos, lead, PCBs, petroleum and related hydrocarbons, and radioactive material) that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law (**hazardous material**); or

2. Other material that may present an imminent substantial danger to persons or property exposed thereto in connection with Work at the Site (**other materials**).

B. Except as otherwise provided in the Contract Documents or as provided by applicable law, Contractor shall not be required to give any notice for the disturbance or observation of any such hazardous materials or other materials where such matter is disturbed or observed as part of the scope of Work under the Contract Documents (such as hazardous waste or hazardous material investigation, remediation or disposal activities which are identified as the subject of Work under the Contract Documents), where Contractor complies with all requirements in the Contract Documents and applicable law respecting such materials.

C. Contractor's Notice of Hazardous Materials Condition shall indicate whether the hazardous materials or other materials were shown or indicated in the Contract Documents to be within the scope of Work, and whether the hazardous materials or other materials were brought to the Site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible.

D. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials if:

1. Contractor knew of the existence of such hazardous materials or other materials at the time Contractor submitted its Bid; or
2. Contractor should have known of the existence of such hazardous material or other materials as a result of its having the responsibility to obtain additional or supplementary examinations, investigation, explorations, tests, studies, and data concerning the conditions at or contiguous to the Site prior to submitting its Bid; or
3. Contractor failed to give the written notice within the required timeframe set forth below.

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

F. In addition to the parties' other rights under this Document 00 7200, if Contractor does not agree to resume Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, Owner may order the disputed portion of Work deleted from the Work, or performed by others, or Owner may invoke its right to terminate Contractor's right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant.

G. If Contractor does not agree with any Owner determination of any adjustment in the Contract Sum or Contract Time under this Article, Contractor may make a claim as provided in Article 12 of this Document 00 7200.

ARTICLE 14 - LEGAL AND MISCELLANEOUS

14.01 Laws And Regulations

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

14.02 Permits And Taxes

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

14.03 Communications And Information Distribution

A. All communications recognized under the Contract Documents shall be in writing, in the form of a serialized document, by type of communication. For example, RFI's shall be serialized beginning with RFI No. 1; payment applications shall be serialized beginning with Payment Application No. 1, submittals shall be serialized per specification section and transmitted with transmittal sheets beginning with Transmittal No. 1; and correspondence shall be serialized beginning with letter No. 1. Contractor may propose other record management and identification systems or protocols, intended to facilitate orderly transmittal of project information, storage and retrieval of such information, which Owner will review consistent with these stated objectives, and accept or reject in its sole discretion.

B. Documents Requiring Signatures. All documents requiring signatures for approval prior to implementing action, as stipulated in other portions of Contract Documents, shall require a manually signed, serialized letter delivered to the other party at its address for notice otherwise specified in the Contract Documents, either personally or by mail.

C. Electronic data transfer of such correspondence will serve to expedite preliminary concurrence of information, only. Receipt of "hard copy" signature on forms is required prior to implementing action or work as the conditions may require. For example, change orders and authorizations for extra cost, require signatures. A party may acknowledge receipt of PDF copies of required correspondence by e-mail, but in the absence of such acknowledgment, mail or personal delivery is required.

D. All emails shall be copied to Owner's and Contractor's Project Representative. Owner reserves the right to preclude e-mail communication, in whole or in part, as Project needs may require. Communication between Owner and Contractor shall not be via Twitter, Facebook, or other types of instant text message systems. Any such communications shall be inadmissible for any purpose related to this Contract.

14.04 Suspension Of Work

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

14.05 Termination Of Contract For Cause

A. The Contractor shall be in default of the Contract Documents and Owner may terminate the Contractor's right to proceed under the Contract Documents, for cause, in whole or in part, should the Contractor commit a material breach of the Contract Documents and not cure such breach within ten (10) calendar days of the date of notice from Owner to the Contractor demanding such cure; or, if such breach is curable but not curable within such ten (10) day period, within such

period of time as is reasonably necessary to accomplish such cure. (In order for the Contractor to avail itself of a time period in excess of 10 calendar days, the Contractor must provide Owner within the ten (10) day period with a written plan acceptable to Owner that demonstrates actual resources, personnel and a schedule to promptly to cure said breach, and then diligently commence and continue such cure according to the written plan).

B. In the event of termination by Owner for cause as provided herein, the Contractor shall deliver to Owner possession of the Work in its then condition including, without limitation, all designs, engineering, Project records, cost data of all types, plans and specifications and contracts with vendors and subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. The Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the date of such termination to comply with the provisions of the Contract Documents. The provisions of this Section shall not be interpreted to diminish any right which Owner may have to claim and recover damages for any breach of the Contract Documents or otherwise, but rather, the Contractor shall compensate Owner for all loss, cost, damage, expense, and/or liability suffered by Owner as a result of such termination and/or failure to comply with the Contract Documents.

C. In the event a termination for cause is later determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, and the Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor claim arising out of a termination for cause shall be made in accord with Article 12 herein. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by the Contractor.

14.06 Termination Of Contract For Convenience

A. Owner may terminate performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever Owner shall determine that termination is in Owner's best interest. Termination shall be effected by Owner delivering to the Contractor notice of termination specifying the extent to which performance of the Work under the Contract Documents is terminated, and the effective date of the termination.

B. Contractor shall comply strictly with Owner's direction regarding the effective date of the termination, the extent of the termination, and shall stop work on the date and to the extent specified.

C. Contractor shall be entitled to a total payment on account of the Contract work so terminated measured by (i.) the actual cost to Contractor of Work actually performed, up to the date of the termination, with profit and overhead limited to twelve percent (12%) of actual cost of work performed, up to but not exceeding the actual contract value of the work completed as measured by the Schedule of Values and Progress Schedule, (ii.) offset by payments made and other contract credits. In connection with any such calculation, however, Owner shall retain all rights under the Contract Documents including, without limitation, claims, indemnities, or setoffs.

D. Under no circumstances may Contractor recover legal costs of any nature, nor may Contract recover costs incurred after the date of the termination.

14.07 Contingent Assignment Of Subcontracts

A. Contractor hereby assigns to Owner each Subcontract for a portion of the Work, provided that:

1. The assignment is effective only after Owner's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) as set forth herein.
2. The assignment is effective only for the Subcontracts which Owner expressly accepts by notifying the Subcontractor in writing;
3. The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 00 6113.13 (Construction Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;

4. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense (except as otherwise provided in this Document 00 7200), sign all instruments and take all actions reasonably requested by Owner to evidence and confirm the effectiveness of the assignment in Owner; and
5. Nothing in this Paragraph shall modify or limit any of Contractor's obligations to Owner arising from acts or omissions occurring before the effectiveness of any Subcontract assignment including, without limitation, all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

14.08 Remedies And Contract Integration

A. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter claims, disputes and other matters in question between Owner and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the applicable court of competent jurisdiction located in the State and County where the Project is located. All Owner remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances Owner shall have any and all other equitable and legal rights and remedies which it would have according to law.

B. The Contract Documents, any Contract Modifications and Change Orders, shall represent the entire and integrated agreement between Owner and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties' agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written Modifications. Owner and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written Modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications; the parties are not and will not rely on any other information, which shall be inadmissible in any proceeding to enforce these documents.

C. Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

D. Neither acceptance of the whole or any part of Work by Owner nor any verbal statements on behalf of Owner or its authorized agents or representatives shall operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to Owner herein nor any right to damages provided in the Contract Documents.

14.09 Interpretation.

A. Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).

B. Contract Documents shall not be construed to create a contractual relationship of any kind between (i) Project Manager or any Owner's representative and Contractor; (ii) Owner and/or its

Representatives and a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (iii) between any persons or entities other than Owner and Contractor.

14.10 Patents

A. Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work. Contractor shall defend, indemnify and hold harmless Owner and each of its officers, employees, consultants and agents including, without limitation, the Board and each Owner's Representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney's fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnities include but are not limited to any and all license fees, whether such fees are agreed by any indemnitee or ordered by a court or administrative body of any competent jurisdiction.

14.11 Substitution For Patented And Specified Articles

A. Except as noted specifically in the instructions to Bidders or in Contract Documents, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words "or Approved Equal" and Contractor may offer any substitute material or process that Contractor considers "equal" in every respect to that so designated and if material or process offered by Contractor is, in opinion of Owner, Equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00 6325 (Substitution Request Form) as provided in Document 00 2113 (Instructions to Bidders). A substitution will be approved only if it is a true "or equal" item in every aspect of its design and quality including, without limitation, its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

14.12 Interest Of Public Officers

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

14.13 Limit Of Liability

A. OWNER, AND EACH OF ITS OFFICERS, BOARD MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, WITHOUT LIMITATION, PROJECT MANAGER AND EACH OTHER OWNER REPRESENTATIVE, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

ARTICLE 15 - WORKING CONDITIONS AND PREVAILING WAGES

15.01 Use Of Site/Sanitary Rules

A. All portions of the Work shall be maintained at all times in neat, clean and sanitary condition. Contractor shall furnish toilets for use of Contractor's and Subcontractors' employees on the Site where needed, and their use shall be strictly enforced. All toilets shall be properly secluded from public observation, and shall be located, constructed and maintained subject to Owner's approval.

B. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land areas identified in and permitted by Contract Documents and other land and areas permitted by applicable laws and regulations, rights of way, permits and easements or as designated by Owner, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, any improvement located thereon, or to Owner or occupant thereof resulting from the performance of Work.

C. During the progress of the Work, Contractor shall keep the Site and the Project free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall clean the site, remove all waste materials, rubbish and debris from and about the Site as well as all tools, appliances, construction equipment and machinery and surplus materials. Contractor shall leave the premises clean and ready for occupancy by Owner at Substantial Completion of Work. Contractor shall restore to original condition all property not designated for alteration by Contract Documents.

D. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigation regarding structural, mechanical, electrical or any other system existing, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

15.02 Protection Of Work, Persons, And Property

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

B. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owners of adjacent property and of Underground Facilities and utility Owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

C. Contractor shall remedy all damage, injury or loss to any property referred to above in this Article, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work or anyone for whose acts any of them may be liable. Contractor's duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. Owner and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor's Work.

D. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

E. Owner may, at its option, retain such moneys due under the Contract Documents as Owner deems necessary until any and all suits or claims against Contractor for injury to persons or property shall be settled and Owner receives satisfactory evidence to that effect.

F. Work within the right-of-way lines of the Town and/or Owner and/or State shall be done in accordance with the standards and specifications of the controlling agency. Permit for such work shall be obtained and paid for by the Contractor before executing the work within such right-of-ways.

15.03 Responsibility For Safety And Health

A. Contractor shall ensure that its and each tier of Subcontractors' employees, agents and invitees comply with applicable health and safety laws while at the Site. These laws include the Occupational Safety and Health Act of 1970 and rules and regulations issued pursuant thereto, and Owner's safety regulations as amended from time to time. Contractor shall comply with all Owner directions regarding protective clothing and gear.

B. Contractor shall be fully responsible for the safety of its and its Subcontractors' employees, agents and invitees on the Site. Contractor shall notify Owner, in writing, of the existence of hazardous conditions, property or equipment at the Site that are not under Contractor's control. Contractor shall be responsible for taking all the necessary precautions against injury to persons or damage to the property of Contractor, Subcontractors or persons from recognized hazards until the responsible party corrects the hazard.

C. Contractor shall confine all persons acting on its or its Subcontractors' behalf to that portion of the Site where Work under the Contract Documents is to be performed, Owner-designated routes for ingress and egress thereto, and any other Owner-designated area. Except those routes for ingress and egress over which Contractor has no right of control, within such areas, Contractor shall provide safe means of access to all places at which persons may at any time have occasion to be present.

15.04 Emergencies

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

15.05 Use Of Roadways And Walkways

A. Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic. Before beginning any interference and only with Owner's prior concurrence, Contractor may provide detour or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of these temporary facilities.

15.06 Nondiscrimination

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

15.07 Prevailing Wages And Working Hours

A. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (i) work of a similar character in the locality in which the Work is performed and (ii) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and Owner to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.

B. Contractor shall forfeit, as a penalty to Owner, $200.00 for each laborer, worker, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, worker or mechanic is paid less than the said stipulated rates for any Work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the Labor Code. The sums and amounts that are forfeited pursuant to this Paragraph and the terms of the Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 00 7200 and the Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by Owner. The Labor Commissioner pursuant to Labor Code Section 1775 shall determine the final amount of forfeiture.

C. Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the Labor Code.

D. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation, Labor Code Sections 1776 and 1810-1815. Failure to so comply shall constitute a default under this Contract.

E. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Sections 1810-1815.

1. Eight hours of labor performed in execution of the Contract constitutes a legal day's work. The time of service of any worker employed on the Project is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week.
2. Contractor and its Subcontractors shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the Project. The record shall be kept open at all reasonable hours to the inspection Owner and to the Division of Labor Standards Enforcement.
3. Contractor or its Subcontractors shall, as a penalty to Owner, forfeit twenty-five dollars ($25) for each worker employed in the execution of the Contract Documents by the respective Contractor or Subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Labor Code Sections 1810-1815.
4. Work performed on the Project by employees of Contractor or its Subcontractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.

F. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776. Further, if this Contract is awarded on or after January 1, 2015, this Project is subject to prevailing wage compliance monitoring and enforcement by the Department of Industrial Relations.

1. Contractor and Subcontractors must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the Work of the Contract Documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.
2. The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor as required by Labor Code Section 1776.

a. Contractor shall inform Owner of the location of records enumerated above, including the street address, Town and county, and shall, within five working days, provide a notice of a change of location and address.

b. Contractor or Subcontractor has 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that the Contractor or Subcontractor fails to comply with the ten-day period, he or she shall, as a penalty to Owner on whose behalf the contract is made or awarded, forfeit $100.00 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this Paragraph due to the failure of a Subcontractor to comply with this Paragraph.

3. With each application for payment, Contractor shall also deliver certified payrolls to Owner as set forth above in this Document 00 7200 (General Conditions), and (if this Contract is awarded on or after April 1, 2015 or continues on or after January 1, 2016, or the Labor Commissioner otherwise directs) concurrently therewith (but in no event less frequently than monthly) directly to the Labor Commissioner in the format prescribed by the Labor Commissioner.

4. Contractor shall post all jobsite notices if and when prescribed by regulation.

15.08 Environmental Controls

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

15.09 Shoring Safety Plan

A. Any conflict between this Paragraph and the Technical Specifications shall be resolved in favor of the most stringent requirement.

B. At least five Days in advance of any excavation five feet or more in depth, Contractor shall submit to Owner a detailed plan showing the shoring, bracing and sloping design (including calculations) and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.

C. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. Owner's acceptance of any drawings showing the shoring or bracing design or Work schedule shall not relieve Contractor of its responsibilities under this Paragraph.

D. Appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system to be used depending on local soil type, water table, stratification, depth, etc.

END OF DOCUMENT

DOCUMENT 00 7316

SUPPLEMENTARY CONDITIONS – INSURANCE AND INDEMNIFICATION

ARTICLE 1 INSURANCE

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

A. Comprehensive General Liability Insurance covering claims for personal injury, bodily injury and property damage arising out of the Work and in a form providing coverage not less than that of a Standard Commercial General Liability Insurance policy (**Occurrence Form**). Such insurance shall provide for all operations and include independent contractors, products liability, completed operations for one year after Final Completion and acceptance of the final payment for the Work, contractual liability, and coverage for explosion, collapse, and underground hazards. The limits of such insurance shall not be coverage of less than **[$5,000,000]** each occurrence, **[$5,000,000]** general aggregate limit, and **[$5,000,000]** aggregate for products and completed operations. The policy shall be endorsed to provide Broad Form Property Damage Coverage.\

B. Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired vehicles. Such insurance shall provide coverage not less than the standard Comprehensive Automobile Liability policy with limits not less than **[$2,000,000]** each person Bodily Injury, **[$2,000,000]** each occurrence Bodily Injury, and **[$2,000,000]** each occurrence Property Damage.

C. All-Risk Course of Construction Insurance including damage to property owned by Owner, Contractor or third parties caused by fire. Insurance shall be in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible shall not exceed [**$10,000.00].** Each loss shall be borne by Contractor.

D. Workers' Compensation Insurance for all persons whom the Contractor may employ in carrying out Work contemplated under Contract Documents, in accordance with the Act of Legislature of State of California, known as "Workers' Compensation Insurance and Safety Act," approved May 26, 1913, and all acts amendatory or supplemental thereto, in the statutory amount.

D. **[Optional]** Environmental Impairment Liability Insurance covering bodily injury and property damage utilizing an occurrence policy form, in an amount no less than **[$1,000,000]** combined single limit for each occurrence.

1.02 If Contractor normally carries insurance in an amount greater than the minimum amounts required by Owner in Paragraph 1.01 above, that greater amount shall become the minimum required amount of insurance for purposes of the Contract. Therefore, Contractor hereby acknowledges and agrees that all insurance carried by it shall be deemed liability coverage for all actions it performs in connection with the Contract. .

The limits of insurance this Contract requires may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the Owner's benefit, to the extent required by the Contract, before the Owner's insurance or self-insurance may be called upon to protect Owner as a named insured.

1.03 All policies of insurance shall be placed with insurers acceptable to Owner. The insurance underwriter(s) for all insurance policies except Workers' Compensation shall have an A. M. Best Company rating of [A-, VIII] or better, unless otherwise specified in Contract Documents. Required minimum amounts of insurance may be increased should conditions of Work, in opinion

of Owner, warrant such increase. Contractor shall increase required insurance amounts upon direction by Owner.

All self-insured retentions (SIR) must be disclosed to the Owner for approval and shall not reduce the coverage limits. Insurance policies containing an SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named Contractor/named insured or the Owner.

1.04 Required Endorsements: The policies required under Document 00 7200 (General Conditions) and this Document 00 7316 (including any umbrella or excess liability policy(ies)) shall be endorsed as follows:

A. Name Owner, its elected and/or appointed governing body and boards, employees, representatives, consultants, and agents, and Project Manager as additional insureds, but only with respect to liability arising out of the activities of the named insured. Additional insured language must be at least as broad as the Insurance Services Office (**ISO**) forms GC 20 38 04 13 and GC 20 37 04 13.

B. Each such policy shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limit of the insurance company's liability required hereunder. Should any of the policies identified herein contain a "cross-suits" exclusion, such exclusion must not apply to any additional insureds.

C. Insurance shall be primary to Owner and no other insurance or self-insured retention carried or held by Owner shall be called upon to contribute to a loss covered by insurance for the named insured.

D. All endorsements shall include the applicable policy number, the named insured(s) and policy terms.

E. Contractor or its insurance broker shall submit to Owner a copy of the "**Declarations Page**" for each policy identified under Paragraph 1.01 above. The Declarations Page shall include the name of the insurance carrier, the applicable policy number, the types of coverage and limits of insurance provided, the effective date(s) of the policy, the insurance broker's name and license number, and a list of all coverage forms and endorsements.

1.05 Certificates of insurance and endorsements shall have clearly typed thereon Owner Contract Number and title of Contract Documents. Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to Owner (Attention: Owner Risk Manager / Purchasing Agent) at the address listed in Document 00 5200 (Agreement), 60 Days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Written notice of cancellation for non-payment shall be mailed within 10 Days of cancellation. Contractor shall maintain all insurance in full force and effect during entire period of performance of Contract Documents, including warranty and guarantee periods. However, Contractor may discontinue All-Risk Course of Construction Insurance after Final Payment, and shall maintain General Liability Insurance throughout the entire Extended Term specified Paragraph 1.01 above. At time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during requested additional period of time. Upon Owner's request, Contractor shall submit to Owner, within 30 Days, copies of the actual insurance policies or renewals or replacements.

1.06 Contractor shall pay all insurance premiums, including any charges for required waivers of subrogation or the endorsement of additional insureds. If Contractor fails to maintain insurance, Owner may take out comparable insurance, and deduct and retain amount of premium from any sums due Contractor under Contract Documents, or require Contractor to reimburse Owner.

1.07 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 Owner under provisions of the Workers' Compensation Insurance and Safety

Act, as amended, or for which compensation is claimed from Owner, Owner 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 Owner is compelled to pay compensation, Owner may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse Owner.

1.08 Nothing herein shall be construed as limiting in any way the extent to which Contractor or any Subcontractor may be held responsible for payment of damages resulting from their operations.

1.09 Except for Comprehensive General Liability Insurance, of which Subcontractors need only obtain $1,000,000 in coverage, all Subcontractors shall maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work unless otherwise indicated in Contract Documents, and Contractor shall cause the Subcontractors to furnish proof thereof to Owner within ten Days of Owner's request.

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

A. Each Professional shall maintain the following insurance, unless otherwise specified in Contract Documents:

B. Professional Liability Insurance, insuring against professional errors and omissions arising from Professional's Work on the Project, in an amount not less than **[$1,000,000]** combined single limit for each occurrence. If Professional cannot provide an occurrence policy, Professional shall provide insurance covering claims made as a result of performance of Work on this Project and shall maintain such insurance in effect for not less than two years following Final Completion of the Project.

1. Professional shall satisfy all other provisions of this Document 00 7316 relating to that insurance, including without limitation providing required insurance certificates (containing the required endorsements) before commencing its Work on the Project.

ARTICLE 2 RESPONSIBILITIES OF CONTRACTOR AND INDEMNIFICATION

2.01 Owner and each of its officers, employees, consultants and agents including, without limitation, the Board, Project Manager and each Owner's Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person; or damage to property resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence, attributable to performance or character of the Work, and Contractor releases all of the foregoing persons and entities from any and all such claims.

2.02 To the furthest extent permitted by law (including, without limitation, Civil Code Section 2782), Contractor shall defend, indemnify, and hold harmless, Owner and each of its officers, employees, consultants and agents including, without limitation, the Board, Project Manager and each Owner's Representative, from claims, suits, actions, losses and liability of every kind, nature and description including, without limitation, claims and fines of regulatory agencies and attorney's fees and consultant's fees, directly or indirectly arising out of, connected with, or resulting from performance of the Work, failure to perform the Work, or condition of the Work that is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, resulting from any cause whatsoever except their sole negligence, willful misconduct, or active negligence.

2.03 With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity including, without limitation, costs of defense, against Owner

and each of its officers, employees, consultants and agents including, without limitation, Owner, the Board, Project Manager and each Owner's Representative. Owner shall provide timely notice to Contractor of any third-party claim relating to the Contract Documents, in accordance with Public Contract Code Section 9201.

2.04 Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them. The Contractor's defense and indemnification obligations are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained herein.

2.05 To the furthest extent permitted by law (including, without limitation, Civil Code §2782), the indemnities, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of Contract, negligence (active or passive), fault or strict liability of the party(ies) indemnified, released, or limited in liability, and shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents. If Contractor fails to perform any of these defense or indemnity obligations, Owner may in its discretion back charge Contractor for Owner's costs and damages resulting therefrom and withhold such sums from progress payments or other Contract moneys which may become due.

2.06 Contractor's obligations to defend and indemnify Owner shall survive the termination or completion of this Contract for the full period of time allowed by law.

END OF DOCUMENT

DOCUMENT 00 7380

APPRENTICESHIP PROGRAM

ARTICLE 1 COMPLIANCE REQUIRED

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

ARTICLE 2 CERTIFICATION OF APPROVAL

2.01 California Labor Code Section 1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one *hour* of apprentices work for every five *hours* of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

A. When unemployment for the previous three month period in the area exceeds an average of 15 percent;

B. When the number of apprentices in training in the area exceeds a ratio of one to five;

C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or

D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

ARTICLE 3 FUND CONTRIBUTIONS

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

ARTICLE 4 APPRENTICESHIP STANDARDS

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

END OF DOCUMENT

DOCUMENT 00 9113

ADDENDA

TOWN OF WOODSIDE

[TOWN CENTER SEWER PUMP STATION IMPROVEMENTS]

[2995 WOODSIDE ROAD]

[DOCUMENT TO BE COMPLETED AS ADDENDA DURING BID PERIOD]

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

The following Addenda were issued, modifying the Project Manual:

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

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

END OF DOCUMENT

SECTION 01 1100
SUMMARY

PART 1 GENERAL

1.01 Summary.

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

1. Work Covered By Contract Documents
2. Bid Item, Allowances and Alternates
3. Specialty Items
4. Work Under Other Contracts
5. Future Work
6. Work Sequence
7. Work Days and Hours
8. Shutdown for Discovery of Cultural Resources
9. Cooperation of Contractor and Coordination with Other Work
10. Partial Occupancy/Utilization Requirements
11. Contractor Use of Site
12. Air Quality Standards
13. Construction Staking and Monument Protection
14. Protection of Existing Structures and Underground Facilities
15. Permits
16. Owner-Furnished Products

1.02 Work Covered by Contract Documents.

A. Work comprises of the construction of Owner's **Town Center Pump Improvements located at 2995 Woodside Road**. The work includes, without limitation, work includes all labor, materials, tool and equipment necessary for furnishing and installing approximately 28 LF of 6" PVC SDR26, 66 LF of 8" PVC SDR26, 24 LF of 12" PVC SDR26 gravity sanitary sewer, and 96 LF of 4" DIP sanitary sewer force main; a 26-foot deep, 72" (6') diameter precast wastewater wet well with two (2) - Flygt submersible pumps; a new System Control and Data Acquisition (SCADA) equipment; a new electrical control cabinet and a new 40kW diesel generator with sound enclosure subbase fuel tank; a 11-foot deep, 48" diameter inside sanitary sewer drop manhole with pour-in-place base, and CIM1000 lined; a timber lagging retaining wall; a new 1" copper water service line; a new asphalt concrete pavement; rehabilitating existing wet well; and abandoning sanitary sewer mains and manholes, complete in place, including but not limited to excavation of trenches, laying pipe materials and installation of structures, backfill trenches, pavement removal and new surfacing and other pertinent work as necessary to construct the project as shown on the approved plans and specified in the project specifications. All work for Town Center Sewer Pump Station Improvements shall be completed within 100 working days.

B.

B. The Work of this Contract comprises construction of all the Work indicated, described in the Specifications, or otherwise required by the Contract Documents. Unless provided otherwise in the Contract Documents, all risk of loss to Work covered by Contract Documents shall rest with Contractor until Final Acceptance of the Work. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices Bid and no direct or additional payment will be made therefore.

C. For all Bid items, furnish and install all Work, including connections to existing systems, indicated and described in Specifications and all other Contract Documents. Work and requirements applicable to each individual Bid item, or unit of Work, shall be deemed incorporated into the description of each Bid item (whether Lump Sum or Unit Price). Any Bid item may be deleted from the Work and Contract Sum, in total or in part, prior to or after award of Contract without compensation in any form or adjustment of other Bid items or prices therefore.

D. Allowance Work shall be done as Change Orders and as specified in Section 01 2600 (Modification Procedures). Identify Allowance Items (See Document 00 4113 [Bid Form]) work on

the Progress Schedules and on Applications for Payment. The Amount given on Document 00 4113 (Bid Form) under each Allowance Item is the sum of money set aside for each Allowance Item. These amounts shall be included in the Contract Sum on the Bid Form. If the cost of Work done under any Allowance Item is less than the amount given on the Bid Form under that Allowance Item, the Contract Sum shall be reduced by the difference between the amount given in the Bid Form and the cost of Work actually done.

1.03 Bid Items, Allowances and Alternates.

A. Descriptions of Lump Sum Items (listed by Bid item numbers): Refer to Schedule of Bid Prices for list of lump sum items – total 11 bid items.

B. Descriptions of Unit Price Items and Basis of Measurement for Payment (listed by Bid item numbers): Refer to Schedule of Bid Prices for list of unit price items – total of 13 bid items.

1.04 Work Days and Hours.

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

B. Work at the Site on weekends or holidays is not permitted, unless Contractor requests otherwise from Owner in writing at least 48 hours in advance and Owner approves in its sole discretion.

1.05 Shutdown for Discovery of Cultural Resources and/or biological species.

A. If discovery is made of items of historical archaeological, biological species or paleontological interest, immediately cease all Work in the area of discovery. Archaeological indicators may include, but are not limited to, dwelling sites, locally darkened soils, stone implements or other artifacts, fragments of glass or ceramics, animal bones, human bones, and fossils. After cessation of excavation, immediately contact Owner. Do not resume Work until authorization is received from Owner. When resumed, excavation or other activities shall be as directed by Owner.

1.06 Cooperation of Contractor and Coordination with Other Work.

A. Coordinate with t h e T o w n and any Town's forces, or other contractors and forces, as required by Document 00 7200 (General Conditions) and this document.

B. Employ a full-time coordinator to constantly review Contract Documents, submittals, changes, and prepare overlay drawings as necessary to avoid conflicts, errors, omissions and untimely construction.

C. The existing facilities must be kept closed to the public for the duration of the project. Contractor is to secure the site from public access at all times. This may require the use of a security guard, signage, perimeter fencing and other measures. All payment for site security shall be included in Bid.

1.07 Partial Occupancy/Utilization Requirements.

A. Allow Owner to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.

B. Possession, use of Work, and placement and installation of equipment by Owner shall not in any way evidence the completion of the Work or any part of it.

C. Contractor shall not be held responsible for damage to the occupied part of the Work resulting from Owner occupancy.

D. Make available, in areas occupied, on a 24 hour per day and 7 day per week basis if required, any utility services, heating, and cooling in condition to be put in operation at the time of occupancy.

1. Responsibility for operation and maintenance of said equipment shall remain with Contractor.
2. Make, and Owner shall certify, an itemized list of each piece of equipment so operated

with the date operation commences.

3. Itemized list noted above shall be basis for commencement of warranty period for equipment.
4. Owner shall pay for utility cost arising out of occupancy by Owner during construction.

E. Use and occupancy by Owner prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by Owner.

F. Prior to date of Final Acceptance of the Work by Owner, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to Defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Document 00 7200 (General Conditions).

G. Use by Owner of Work or part thereof as contemplated by this Section 01 1100 shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by Owner of any of the conditions thereof.

H. Owner may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on dates described in this Section 01 1100, if any, prior to Substantial Completion of all of the Work. Notify Owner in writing when Contractor considers any such part of the Work ready for its intended use and Substantially Complete and request Owner to issue a Certificate of Substantial Completion for that part of the Work.

1.08 Contractor Use of Site.

A. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws. Do not unreasonably encumber Site with materials or equipment.

B. Assume full responsibility for protection and safekeeping of products stored on premises. Move any stored products that interfere with operations of Owner or other contractor.

C. Parking, storage, staging, trailer and Work areas shall be coordinated and approved by the Tow of Woodside and comply with all other Contract document requirements. Owner will provide a storage area for Contractor's equipment and materials. Do not store construction materials in the dripline of any tree. Prior to placement of any parking, placement of equipment and supplies the Contractor shall negotiate with the Town an area to be use by them.

D. Prior to commencement of Work or excavation, Contractor and Owner shall jointly survey the area adjacent to the Project area making permanent note and record of such existing damage such as cracks, sags or other similar damage. This record shall serve as a basis for determination of subsequent damage to structures, conditions or other existing improvements due to Contractor’s operations. All parties making the survey shall sign the official record of existing damage. Cracks, sags or damage of any nature to the adjacent Project area, not noted in the original survey but subsequently noted, shall be reported immediately to Owner.

E. The Contractor shall follow all Town ordinances in force during the duration of this Contract.

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

G. When suspect materials, outside the scope of Work, are encountered during the Work or restoration process, the Contractor shall immediately contact the Project Manager for evaluation and approval of the methods for dealing with the material.

1.09 Air Quality Standards.

A. Ensure that idling time for all heavy equipment is minimized to reduce on-Site emissions.

B. Maintain equipment in good mechanical condition.

C. Cover trucks hauling dirt.

D. Limit dust emissions during periods of high winds (greater than 15 miles per hour).

E. Replace ground cover in disturbed areas as soon as possible.

F. Enclose, cover, water, or apply soil binders to exposed stockpiles.

G. Remove earth tracked onto neighboring paved roads at least once daily.

H. Limit equipment speed to 10 miles per hour in unpaved areas.

1.10 Construction Staking and Monument Protection.

A. Notify Owner 3 Business Days prior to the need for initial staking. Owner will provide engineering surveys to establish construction stakes that in Owner's judgment are necessary to enable Contractor to proceed with the Work.

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

C. Contractor shall be responsible for laying out the Work, shall protect and preserve the established construction stakes and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Whenever Contractor knows or reasonably should know that any Work activity is likely to damage or destroy any construction stakes or property monuments, or require relocation because of necessary changes in grades or locations, provide at least 2 Business Days advance notice to Owner. In any event, notify Owner whenever any construction stakes or property monuments are lost or destroyed or require relocation because of necessary changes in grades or locations. Owner shall replace or repair construction stakes or property monuments at Contractor's expense.

D. Perform brush clearing and traffic control, as necessary, in Owner's sole judgment.

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

F. If Owner's survey crews are not available to perform the survey staking following proper notification, Contractor shall provide its own survey staking. Provide Owner with Contractor's survey staking information in writing within 3 Business Days after it becomes available to Contractor.

1.11 Geotechnical Data and Existing Conditions.

A. Available Documentation: In accordance with, and subject to, the provisions of Document 00 3132 (Geotechnical Data and Existing Conditions), the following documentation is available for review at the Town Hall.

1.12 Protection of Existing Structures and Underground Facilities.

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

1. Sewer lines: Town of Woodside Public Works Department
   Phone: (650) 851-6790
2. Water/Sewer lines: California Water Services. Phone: (650) 851-1645
3. Telephone conduit: AT&T

Phone: USA Toll Free: (800) 310-2355

4. Cable: COMCAST – Cable TV
   Phone: USA Toll Free: (888) 824-8087

B. Where overhead service to a structure, known to receive service, does not exist, then underground service shall be assumed to exist.

C. Attention is also directed to the existence of overhead power and telephone lines.

D. Perform pot-holing by hand within 24 inches (in any direction) of the Underground Facilities. This may be done on an area-by-area basis, but shall be accomplished at least 7 Days in advance of the date of construction within such area.

E. Telemetry antennas: Ensure that the telemetry and voice communication antennas located on the [Identify the Building] roof remain operational. Owner's telemetry system is critical to the function and operation of Owner's water supply and distribution system. Coordinate relocation of equipment related to the telemetry and voice communication systems with Owner. Notify Owner 3 Days prior to conducting any Work in the vicinity of the telemetry antenna.

F. No attempt has been made to locate private utilities on private property such as sprinkler irrigation systems or electrical conduits. Contact the property owners prior to construction.

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

H. Additional compensation or extension of time on account of utilities not indicated or otherwise brought to Contractor's attention including reasonable action taken to protect or repair damage shall be determined as provided in Document 00 7200 (General Conditions).

I. Contractor shall carry out construction activities in a manner that does not disrupt privacy, access to private property, or traffic, except as allowed by permit, or does not disrupt the flow of storm water or impair the storm water channel.

1.13 Permits.

A. Permits, agreements, or written authorizations that are known by Owner to apply to this Project are listed below:

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

   (415) 557-0100 (Phone)
   (415) 557-0123 (Fax)

B. All other permits that may be required, such as electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, etc., have not been applied for and shall be obtained by Contractor. Applicable permit fees will be reimbursed to the extent specified in Document 00 7200 (General Conditions).

1.14 Actual Damages for Permit Violations.

A. In addition to damages which are impracticable or extremely difficult to determine, for which liquidated damages will be assessed as described in Document 00 5200 (Agreement) and

Document 00 7200 (General Conditions), Owner may incur actual damages, including fines imposed by any regulatory agency, resulting from **loss of use of the use of any permit described in this Document, or from** use in violation of legal or regulatory requirements where the violations result from Contractor's activities. Continuous operation of the **sewer pump station system** in compliance with legal or regulatory requirements is essential to avoid discharges that would violate applicable regulations. Violations or threatened violations may subject Owner to fines of up to $10,000 per Day or occurrence and/or other costs or civil liabilities.

B. Contractor shall be liable for and shall pay Owner the amount of any actual losses in addition to liquidated damages or other remedies provided by the Contract Documents.

C. The amount of liquidated damages provided in Document 00 5200 (Agreement) and Document 00 7200 (General Conditions) is not intended to include, nor does the amount include, any damages incurred by Owner for reasons other than those listed in that paragraph. Any money due or to become due to Contractor may be retained by Owner to cover both the liquidated and the actual damages described above and, should such money not be sufficient to cover such damages, Owner shall have the right to recover the balance from Contractor or its sureties.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTIONS – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2000

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 SUMMARY

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

1.02 REFERENCES

A. California Public Contract Code
B. Code of Civil Procedure
C. Government Code
D. Civil Code

1.03 COMPOSITION AND SCOPE OF CONTRACT SUM

A. **Scope of Contract Sum**

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

2. Contract Sum may be expressed as lump sum, unit price, GMP, allowance, or combination thereof.

B. **Unit Price items**

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

C. **Lump Sum Items**

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

3. Lump sum items shall be paid based upon the approved Schedule of Values, which shall

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

D. **Allowance Items**

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

1.04 PAYMENT PROCEDURES

A. **Schedule of Values:**

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

B. **Contractor's Requests for Progress Payments**

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

shall submit to Owner Contractor's and its Subcontractors' certified payroll records required to be maintained pursuant to Labor Code Section 1776 for all labor performed during pay periods ending during the period covered by the Application for Payment.

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

C. **Owner's Review of Progress Payment Applications**

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

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

1. No payment shall be made for materials or equipment not yet incorporated into the Work, except as specified elsewhere in the Contract Documents or as may be agreed to by Owner in its sole discretion. Where Contractor requests payment on the basis of materials and equipment not incorporated in the Work, Contractor must satisfy the following conditions:
2. The materials and/or equipment shall be delivered and suitably stored at the Site or at another local location agreed to in writing, for example, a mutually acceptable bonded and insured warehouse.
3. Full title to the materials and/or equipment shall vest in Owner at the time of delivery to the Site, warehouse or other storage location. Obtain a negotiable warehouse receipt, endorsed over to Owner for materials and/or equipment stored in an off-site warehouse. No payment will be made until such endorsed receipts are delivered to Owner.
4. Stockpiled materials and/or equipment shall be available for Owner inspection, but Owner shall have no obligation to inspect them and its inspection or failure to inspect shall not relieve Contractor of any obligations under the Contract Documents. Materials and/or equipment shall be segregated and labeled or tagged to identify these specific Contract Documents.
5. After delivery of materials and/or equipment, if any inherent or acquired defects are discovered, defective materials and/or equipment shall be removed and replaced with suitable materials and/or equipment at Contractor's expense.
6. At Contractor's expense, insure the materials and/or equipment against theft, fire, flood, vandalism, and malicious mischief, as well as any other coverages required under the Contract Documents.
7. Contractor's Application for Payment shall be accompanied by a bill of sale, invoice or other documentation warranting that Owner has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect Owner interest therein, all of which must be satisfactory to Owner. This documentation shall include, without limitation, conditional releases of mechanics' liens and stop notices from all those providing materials and equipment as to which the Application for Payment relates, as well as unconditional releases of the same from the same as to the previous Application for Payment for which they have not already been provided. Amounts previously paid for materials and equipment prior to incorporation into the Work shall be deducted from amounts otherwise due Contractor as they are incorporated.

1.05 FINAL PAYMENT

A. **Final Payment**

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

B. **Final Accounting**

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

1.06 SUBSTITUTION OF SECURITIES

A. **Public Contract Code Section 22300.** In accordance with the provisions of Public Contract Code Section 22300, substitution of securities for any moneys withheld under Contract Documents to ensure performance is permitted under following conditions:

1. At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and Owner which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such moneys to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.
2. Alternatively, Contractor may request and Owner shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and receive the interest earned on the investments upon the same terms provided for securities deposited by Contractor. Upon satisfactory completion of the work of the Contract Documents, Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from Owner. Consistent with Public Contract Code Section 7107(d), Contractor shall then pay to each Subcontractor, not later than seven Days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of Contractor.
3. Contractor shall be beneficial owner of securities substituted for moneys withheld and shall receive any interest thereon.
4. Contractor may enter into an escrow agreement, form included in Contract Documents, as authorized under Public Contract Code Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract Documents.
5. Public Contract Code Section 22300, in effect on Bid Day, is hereby incorporated in full by this reference and shall supersede anything inconsistent therewith.

ARTICLE 3 - PRODUCTS – NOT USED

ARTICLE 4 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2600

MODIFICATION PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes requirements that supplement the paragraphs of Document 00 7200 (General Conditions).

B. Description of procedures for modifying the Contract Documents and determining costs for changes in Contract Sum or Contract Time.

1.02 PROCEDURES FOR CONTRACTOR INITIATED CHANGE ORDER

A. Contractor-Initiated Change Proposal Request (**CPR**) and Procedures**:**

1. Contractor may initiate changes by submitting a Change Proposal Request (**CPR**).
2. Whenever Contractor elects or is entitled to submit a CPR, Contractor shall prepare and submit to Owner for consideration a CPR using the Cost Proposal Form attached to this Section 01 2600 or otherwise included in this Project Manual. All CPR's must contain a complete breakdown of costs of credits, deducts and extras; itemizing labor, materials, equipment, markup, bonds, insurance and taxes; and any requested changes to Contract Time. All Subcontractor Work shall be so indicated. Individual entries on the CPR form shall include applicable Schedule of Values code, with all amounts determined as provided herein. After receipt of a CPR with a detailed breakdown, Owner will act promptly thereon.
3. If Owner accepts a CPR, Owner will prepare a Change Order for Owner and Contractor signatures.
4. If CPR is not acceptable to Owner because it does not agree with Contractor's proposed cost and/or time, Owner will provide comments thereto. Contractor will then, within seven (7) Days (except as otherwise provided herein), submit a revised CPR.
5. When necessity to proceed with a change does not allow Owner sufficient time to conduct a proper check of a CPR (or revised CPR), Owner may issue a Change Directive (**CD**) as provided below.

B. Contractor-Initiated Request for Information (**RFI**) Procedures, Requirements and Limitations:

1. Contractor may submit RFI's for clarifications in Owner-prepared Contract Documents, which may result in the Contractor submitting a CPR.
2. Whenever Contractor requires information regarding the Project or Owner-prepared Contract Documents, or receives a request for such information from a Subcontractor, Contractor may prepare and deliver an RFI to Owner. Contractor shall use RFI format provided on approval by Owner. Contractor shall not issue an RFI to Owner solely to clarify Contractor-prepared Construction Documents. Contractor must submit time critical RFIs at least 30 days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.
3. Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation for the effort required to submit the RFIs. Contractor shall be responsible for Owner's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by Owner; at Owner discretion, such costs may be deducted from progress payments or final payment.

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

C. Time Requirements:

1. If Contractor believes that an Owner response to an RFI, submittal or other Owner direction, results in change in Contract Sum or Contract Time, Contractor shall notify Owner with the issuance of a preliminary CPR within 10 Days after receiving Owner's response or direction, and in no event after starting the disputed work or later than the time allowed under Article 12 of Document 00 7200 (General Conditions). If Contractor also requests a time extension, or has issued a notice of delay or otherwise requests a time extension with a CPR, then Contractor shall submit the TIE required in these Contract Documents, including Section 01 3200 (Progress Schedules and Reports), concurrently with the CPR and in no event later than 10 Days after providing the notice of delay.
2. If Contractor requires more time to accurately identify the required changes to the Contract Sum or Contract Time, Contractor may submit an updated and final CPR and TIE within 14 days of submitting the preliminary CPR.
3. If Owner agrees with Contractor's CPR and/or TIE, then Owner will prepare a Change Order for Owner and Contractor signatures. If Owner disagrees with Contractor, then Contractor may give notice of potential claim as provided in Article 12 of Document 00 7200 (General Conditions), and proceed thereunder.
4. Contractor must submit all CPR's (preliminary and final), notices of potential claim and Claims, and TIE's within the required time periods. Any failure to do so waives Contractor's right to submit a CPR or file a Claim.

D. Cost Estimate Information:

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

1.03 PROCEDURES FOR OWNER INITIATED CHANGE ORDERS

A. Owner Initiated Change Directives (**CD**):

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

   a. Return CD signed, thereby accepting Owner response, including adjustment to time and cost (if any).
   b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by letter A, B, etc. for each revision), if Owner so requests.

c. Give notice of intent to submit a claim as described in Article 12 of Document 00 7200 (General Conditions), and submit its claim as provided therein.

4. If CPR or the CD provides for an adjustment to any Contract Sum, the adjustment shall be based on one of the following methods:

   a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
   b. Contractor to proceed on cost reimbursable (force account) basis while negotiating towards a firm price.
   c. Cost to be determined in a manner agreed.

5. Change Directive signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum or the method for determining them. Such agreement shall be effective immediately and shall be finalized as a Change Order. Where Owner authorizes CD work on a time and materials basis up to a maximum amount, then Contractor shall promptly advise Owner upon reaching 75% of such maximum amount, otherwise Contractor shall accept fully the risk of completing the CD work without exceeding such maximum amount.
6. If Contractor does not respond promptly or disagrees with the method for adjustment (or non-adjustment) in the Contract Sum, the method and the adjustment shall be determined by Owner on the basis of the Contract Documents and the reasonable expenditures and savings of those performing the Work attributable to the change. If the parties still do not agree on the proper adjustment due to a Change Directive, Contractor may file a Claim per Article 12 of Document 00 7200 (General Conditions) and/or Owner may direct the changed work through a unilateral change order. Contractor shall keep and present an itemized accounting in a manner consistent with the SOV, together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided herein.
7. Pending final determination of cost to Owner, Contractor may include amounts not in dispute in its Applications for Payment. The amount of credit to be allowed by Contractor to Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by Owner. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for Markup shall be figured on the basis of net increase, if any, with respect to that change.

B. Owner Initiated Change Order (**CO**) or Request for Proposal (**RFP**):

1. Owner may initiate changes in the Work or Contract Time by issuing a Request for Proposal (**RFP**) or Change Order (**CO**) to Contractor.
2. Owner may issue an RFP to Contractor. Any RFP will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.
3. In response to an RFP, Contractor shall furnish a Change Proposal Request (**CPR**) within twenty-one (21) Business Days of Owner's RFP. Upon approval of CPR, Owner may issue a Change Directive directing Contractor to proceed with extra Work.
4. If the parties agree on price and time for the work, the Owner will issue a Contact Change Order. If the parties do not agree on the price or time for a CPR, Owner may either issue a CD or decide the issue per Article 12 of Document 00 7200 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

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

A. Adjustment of Schedules to Reflect Change Orders or CDs:

1. Contractor shall revise Schedule of Values and Application for Payment forms to record each authorized Change Order or CD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.
2. Contractor shall revise the Progress Schedules prior to the next monthly pay period, to reflect CO or CD.
3. Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.

B. Required Documentation for Adjustments to Contract Amounts:

1. For all changes and cost adjustments requested, Contractor shall provide documentation of change in Contract Amounts asserted, with sufficient data to allow evaluation of the proposal.
2. In all requests for compensation, cost proposals, estimates, claims and any other calculation of costs made under the Contract Documents, Contractor shall breakout and quantify costs of labor, equipment and materials identified herein, for Contractor and subcontractors of any tier.
3. Contractor shall, on request, provide additional data to support computations for:

   a. Quantities of products, materials, labor and equipment.
   b. Taxes, insurance, and bonds.
   c. Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
   d. Credit for deletions from Contract, similarly documented.

4. Contractor shall support each claim or computation for additional cost, with additional information including:

   a. Origin and date of claim or request for additional compensation.
   b. Dates and times Work was performed and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.
   e. Credit for deletions from Contract, similarly documented.

C. Responses and Disputes:

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

1.05 COST DETERMINATION FOR CHANGES IN CONTRACT AMOUNTS

A. Calculation of Total Cost of Extra Work:

1. Total cost of changed Work, extra Work or of Work omitted shall be the sum of three components defined immediately below as: Component 1 (Direct Cost of Construction or Direct Costs); Component 2 (Markup); and, Component 3 (Bonds, Insurance, Taxes)
2. Component 1: Direct Costs of labor, equipment and materials, is calculated based upon actually incurred (or omitted) labor costs, equipment rental costs, and material costs, as defined herein;
3. Component 2: Markup on such actually incurred Direct Costs, is applied in the percentages identified below; and
4. Component 3: Actual additional costs for any additionally required bonds, insurance, and/or taxes by Contractor, Subcontractors, or other forces, defined herein, is calculated without markup.
5. All amounts payable to Subcontractors under Components 1, 2, and 3: must be earned under the terms of the applicable Subcontracts; must be properly requested, documented

and permitted under the terms of the applicable subcontract(s) and Contract Documents; and shall be payable only if changed Work complies with terms of Contract Documents.

1.06 MEASUREMENT OF DIRECT COST OF CONSTRUCTION (COST COMPONENT 1)

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

1. Component 1 has three subcomponents, also referred to as labor, equipment, and materials (**LEM)**:

   a. Labor (Component 1A)
   b. Equipment (Component 1B)
   c. Materials (Component 1C)

B. Measurement of Cost of Labor (Component 1A):

1. Cost of Labor shall be calculated as: Cost of labor for workers (including forepersons when authorized by Owner) used in actual and direct performance of the subject work, whether employer is Contractor, Subcontractor or other forces, in the sum of the following:

   a. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
   b. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined, such as worker's compensation insurance. Such labor surcharge shall not exceed generally accepted standards in the State for labor rates in effect on date upon which extra Work is accomplished.
   c. Cost of labor shall include no other costs, fees or charges.

2. Labor cost for operators of equipment owned and operated by Contractor or any Subcontractor, shall be no more than rates of such labor established by collective bargaining agreements for type of worker and location of Work, whether or not owner-operator (i.e., Contractor or Subcontractor) is actually covered by such an agreement.
3. Cost of labor shall be recorded and documented in certified payroll records, maintained in the form customary and/or required in the State, and delivered to Owner weekly.

C. Measurement of Cost of Equipment (Component 1B):

1. Measurement of Component 1B (Cost of Equipment). Cost of Equipment shall be calculated as: Cost of equipment used in actual and direct performance of the subject work, whether by Contractor, Subcontractor or other forces. Cost of Equipment shall be calculated as herein described.
2. For rented equipment, cost will be based on actual rental invoices, appropriate for the use and duration of the work. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by Owner.
3. Equipment rental cost for Contractor or Subcontractor-owned equipment, shall be determined by reference to, and not in excess of, the generally accepted standards in the State for equipment rental rates in effect on date upon which extra Work is accomplished. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor or Subcontractor-owned equipment at rental rate listed in the most recent edition of the Caltrans Standard Schedules and Specifications, and absent a rental rate therein, then the Association of Equipment Distributors (**AED**) book.
4. In all cases, rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

5. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of $100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.
6. For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by Owner. The following shall be used in computing rental time of equipment:
   a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
   b. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
   c. Rates shall correspond to actual rates paid by Contractor, i.e., if Contractor pays lower weekly or monthly rates, then same shall be charged to Owner.
7. For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
   a. Owner will pay for costs of loading and unloading equipment.
   b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
   c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission or appropriate State Dept. of Transportation.
   d. Owner will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
   e. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which Owner directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and Owner legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.
8. Employee vehicles are not part of Component 1A, rather, are included within Component 2 (Markup).
9. Cost of Equipment shall include no other costs, fees or charges.

D. Measurement of Cost of Material (Component 1C):

1. Cost of Material shall be calculated as herein described. Cost of such materials will be cost to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:
2. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to Owner notwithstanding fact that such discount may not have been taken.
3. For materials salvaged upon completion of Work, salvage value of materials shall be deducted from cost, less discounts, of materials.
4. If cost of a material is, in opinion of Owner, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in this Paragraph.
5. Cost of Material shall include no other costs, fees or charges.

1.07 MEASUREMENT AND PAYMENT OF MARKUP (COST COMPONENT 2)

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

1. Markup on Direct Cost of labor, materials and equipment for extra Work pursuant to the Contract Documents performed by Contractor shall be 15%.
2. When extra Work is performed by Subcontractors, regardless of the number of tiers, total Markup on Component 1 Direct Costs shall be 20%. Contractor and its Subcontractors shall divide the 20% as they may agree.
3. Under no circumstances shall the total Markup on any extra Work exceed 20%, stated as a percent of the Direct Cost of labor, equipment and materials. This limitation shall apply regardless of the actual number of subcontract tiers.
4. On proposals covering both increases and decreases in Contract Sum, Markup shall be allowed on the net increase only as determined above. When the net difference is a deletion, no percentage for Markup shall be allowed, but rather an appropriate percentage deduction shall be issued in the amount of the net difference.

B. Measurement and Payment of Markup (Component 2):

1. Markup (Component 2) provides complete compensation to Contractor and all Subcontractors for:

   a. All Contractor and Subcontractor profit;
   b. All Contractor and Subcontractor home-office overhead;
   c. All Contractor and Subcontractor assumption of risk assigned to Contractor under the Contract Documents;
   d. Subject to the qualifications below regarding self-performed work, all General Conditions and General Requirements of Contractor (and, if applicable, Subcontractors).

2. Profit. Compensation for profit included within Component 2 (Markup), includes without limitation: Fees of all types, nature and description; and Profit and margins of all types, nature and description.
3. Home Office Expenses. Compensation for home office expenses included within Component 2 (Markup), includes without limitation: Salaries and other compensation of any type of Contractor's and Subcontractor's personnel (management, administrative and clerical), and all direct and indirect operating, travel, payroll, safety, storage, quality control, maintenance and overhead costs of any nature whatsoever, incurred by Contractor and Subcontractors at any location other than the Project specific site office, including without limitation, Contractor's principal or branch offices; insurance premiums other than those for Project specific insurance directed by the Owner in a change order; all hardware, software, supplies and support personnel necessary or convenient for Contractor's capture, documentation and maintenance of its costs and cost accounting data and cost accounting and control systems and work progress reporting.
4. Assumption of Risk. Compensation for Contractor's and Subcontractor's assumption of risk under the Contract Documents, included within Component 2 (Markup), includes, without limitation, loss, cost, damage, expense or liability resulting directly or indirectly from any of the following causes (**unallowable costs**), for Contractor and Subcontractors of any tier: noncompliance with the Contract Documents, fault or negligence, defective or non-conforming Work, by Contractor or any Subcontractor or Vendor of any tier or anyone directly or indirectly employed by any of them, or for whose acts or omissions any of them are responsible or liable at law or under the Contract Documents; cost overruns of any type; costs in excess of any lump sum, not to exceed amount or GMP; costs resulting from bid or "buy out" errors, unallocated scope, or incomplete transfer of scope or contract terms to Subcontractors; any costs incurred by Contractor relating to a Change in the Work without a Change Order or Change Directive in accordance with the Contract Documents; costs for work or materials for which no price is fixed in the Contract Documents, unless it is expressly specified that such work or material is to be paid for as extra work.

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

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

A. Measurement of Bonds, Insurance, Taxes (Component 3):

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

1.09 EFFECT OF PAYMENT

A. Change Order Compensation is All Inclusive.

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

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

B. Exception for Changes Extending the Contract Time.

1. Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct LEM costs, provided Contractor can demonstrate such additional costs are (i.) actually incurred performing the Work, (ii.) not compensated by Component 2 (Markup), and (iii) directly result from the extended Contract Time. Contractor shall make such request and provide such documentation following all required procedures, documentation and time requirements in the Contract Documents, and subject to all contract limitations of liability. Contractor may not seek or recover such costs using formulas (e.g., Eichleay).

C. Limits of Liability/Accord and Satisfaction.

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

1.10 MISCELLANEOUS REQUIREMENTS

A. Owner-Furnished Materials.

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

B. Records And Certification.

1. All charges shall be recorded daily and summarized in Change Proposal Request form attached hereto. Contractor or authorized representative shall complete and sign form each day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; and a list by size type and identification number of equipment and hours operated.
2. Owner shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including CD Work. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to Article 12 of Document 00 7200 (General Conditions).

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

[COST PROPOSAL FORM FOLLOWS ON NEXT PAGE]

COST PROPOSAL FORM

Town Center Sewer Pump Station Improvements

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

To: TOWN OF WOODSIDE
Attention: **[_____]**
2955 Woodside Road, Woodside, CA 94062
Phone: (650) 851-6790
Fax: (___) ___-_____

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

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

ITEM DESCRIPTION LABOR	PRIME CONTRACTOR	SUB 1	SUB 2	SUB 3	SUB 4	TOTAL
EQUIPMENT						
MATERIAL						
TOTAL DIRECT COST OF CONSTRUCTION (LEM)						
MARKUP FOR PRIME CONTRACTOR'S SELF-PERFORMED WORK (15%)						
MARKUP FOR SUBCONTRACTOR-PERFORMED WORK (20%)						
BONDS, INSURANCE AND TAXES						
GRAND TOTAL						
REQUESTED CHANGE IN CONTRACT TIME (DAYS) (Time Impact Evaluation Enclosed)						

_____
By Contractor: Signature: Date:

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3119

PROJECT MEETINGS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes description of required project meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. Preconstruction Conference. Owner will call for and administer Preconstruction Conference at time and place to be announced (usually the week prior to start of Work at the Site). Contractor, all major Subcontractors, and major suppliers shall attend Preconstruction Conference. Agenda may include, without limitation, the following items:

1. Schedules
2. Personnel and vehicle permit procedures
3. Use of premises
4. Location of the Contractor's on-Site facilities
5. Security
6. Housekeeping
7. Submittal and RFI procedures
8. Inspection and testing procedures, on-Site and off-Site
9. Utility shutdown procedures
10. Control and reference point survey procedures
11. Injury and Illness Prevention Program
12. Contractor's Initial Progress Schedule
13. Contractor's Schedule of Values
14. Contractor's Schedule of Submittals
15. Jurisdictional agency requirements
16. Owner will distribute copies of minutes to attendees. Attendees shall have seven Days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Preconstruction Conference.

1.03 WEEKLY PROJECT MEETINGS

A. Owner will schedule and administer weekly progress meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by Owner. Meetings shall be held at Owner's Offices unless otherwise specified in Contract Documents.

1. Owner's Representative will prepare agenda and distribute it four Days in advance of meeting to Contractor.
2. Participants with agenda items shall present them.
3. The Architect/Engineer and other responsible entities shall attend meetings unless otherwise specified in Contract Documents or provided by Owner.
4. Owner shall record and distribute the meeting minutes. Minutes shall be distributed by the Owner to the Contractor within three business days after the meeting. Contractor shall distribute the minutes to those affected by decisions made at meeting. Attendees shall have five business days to submit comments or additions to the minutes. Minutes shall constitute final memorialization of results of meeting.
5. Progress meetings shall be attended by Contractor's job superintendent, major Subcontractors and suppliers, Owner, and others as appropriate to agenda topics for each meeting.
6. Agenda may contain the following items, as appropriate:

a. Review, revise as necessary, and approve previous meeting minutes
b. Review of Work progress since last meeting
c. Status of Construction Work Schedule, delivery schedules, adjustments
d. Submittal, RFI, and Change Order status
e. Review of the Contractor's safety program activities and results, including report on all serious injury and/or damage accidents
f. Other items affecting progress of Work

1.04 PROGRESS SCHEDULE AND BILLING MEETINGS

A. A meeting will be held on approximately the 20th of each month to review the schedule update submittal and progress payment application.

B. At this meeting, at a minimum, the following items will be reviewed:

1. Percent complete of each activity;
2. Time impact evaluations for Change Orders and Time Extension Request;
3. Actual and anticipated activity sequence changes;
4. Actual and anticipated duration changes; and
5. Actual and anticipated Contractor delays.

C. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, Contractor's General Superintendent and Scheduler shall attend these meetings.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3200

PROGRESS SCHEDULES AND REPORTS

PART 1 – GENERAL

1.01 SUMMARY

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

1.02 CONTRACTOR TO SUBMIT BASELINE AND PROGRESS SCHEDULES

A. Contractor shall submit an Initial Contract Schedule two weeks prior to the first Application for Payment Contractor's Initial Contract Schedule is subject to Owner's review and comments. The approved Initial Contract Schedule shall be referred to as the **Baseline Schedule**.

B. Contractor's Baseline Schedule and progress schedules shall show Contractor's construction and procurement activities including, without limitation, equipment procurement and delivery (Contractor and Owner supplied), activities with Subcontractors and suppliers, major submittal reviews, commissioning of systems, use of major equipment on site, and necessary interface with Owner and third parties required to complete the Work in a timely manner and in accordance with Contract Time.

1.03 SCHEDULE REQUIREMENTS.

A. Unless Owner agrees in writing otherwise, progress schedule shall be on Primavera P6, most current version of Sure Track, or equivalent software acceptable to Owner, as Owner may specify, which Contractor shall prepare and supply to Owner, with all datapoint entries completed for start dates, necessary work activities, durations (not longer than 21 calendar days), and logic ties.

B. Contractor shall develop a network plan and schedule for the Project demonstrating complete fulfillment of all Contract requirements, shall keep the network plans up to date in accordance with the requirements of this Section 01 3200, and shall utilize the Critical Path Method (**CPM**) in planning, coordinating, performing and reporting the work under this contract, including all activities of Subcontractors, equipment vendors, and suppliers, and in assisting Owner in monitoring the progress of the Work.

C. CPM network is a graphic depiction of the Contractor's construction plan, showing the sequential steps needed to reach completion of the Work within the prescribed Contract Time. It shall depict events and tasks as activities, and their interrelationships, and shall recognize the progress that must be made on one activity before subsequent activities can begin. These activities shall be logically represented in a CPM network showing their interrelationships in a chronological fashion. As each activity has a time allocation, the completed network shall show the critical path of activities that must be completed on time if the entire Project is not to be delayed. It shall also be possible to identify the earliest and latest start and finish times for each activity if the overall Project is not to be delayed. Therefore, the CPM network shall be comprehensive and shall include all interdependencies and interactions required to perform the Work of the Project.

D. Contractor's Baseline Schedule and progress schedules shall be in the form of a CPM (arrow) diagram.
Contractor shall provide Owner with native format electronic schedules and hard copies of the Baseline Schedule, schedule updates, and lookahead schedules. All electronic and hard copies of the schedule that Contractor provides to Owner shall indicate the critical path of the Work (in red) and shall show a logical progression of the Work through ***[Substantial and Final]*** completion within Contract Time.

E. Unless Owner agrees in writing otherwise, progress schedules shall also show early and late start and finish dates and total available float (float to the successor activity's late start date) for each activity.

F. Owner has no obligation to accept an early completion schedule.

1.04 MONTHLY UPDATES

A. Contractor's progress schedule shall be updated monthly to reflect actual progress. The schedule shall be subject to Owner's review and acceptance for use in monitoring Contractor's Work and evaluating Applications for Payment.

B. Contractor shall supply Owner with an electronic copy of the updated progress schedule with each monthly payment application. Contractor shall provide Owner with two-week lookahead schedules weekly, showing in detail and activities and resources scheduled for the immediate two week period.

1.05 RECOVERY SCHEDULE

A. Owner may request a recovery schedule should Contractor fall 21 or more Days behind any schedule Milestone, which schedule shall show Contractor's plan and resources committed to retain Contract completion dates.

B. The recovery schedule shall show the intended critical path. If Owner requests, Contractor shall also:

1. Secure and demonstrate appropriate Subcontractor and supplier consent to the recovery schedule.
2. Submit a written plan and narrative explaining on trade flow and construction flow changes and man-hour loading assumptions for major Work activities and/or Subcontractors.

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

A. When Contractor requests a time extension for any reason, Contractor shall submit a TIE, in accordance with Article 11 of Document 00 7200 and Section 01 2600, Article 1.02.C that provides information justifying the request and stating the extent of the adjustment requested for each specific change or alleged delay. Each TIE shall be in a form and content that is acceptable to Owner and that includes both a written narrative and a schedule diagram depicting how the changed Work or other impact affects other schedule activities. The schedule diagram shall show how Contractor proposes to incorporate the changed Work or other impact in the schedule and how it impacts the current Schedule update critical path or otherwise. Contractor is also responsible for establishing time extensions based on the TIE's impact on the critical path. The diagram shall be tied to the main sequence of scheduled activities to enable Owner to evaluate the impact of changed Work to the scheduled critical path.

B. Contractor is responsible for all costs associated with preparing TIE's, and the process of incorporating TIE's into the current schedule update. Contractor shall provide Owner with four copies of each TIE.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 3300

SUBMITTALS

PART 1 – GENERAL

1.01 SUMMARY

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

1.02 SCHEDULE OF SUBMITTALS

A. Contractor shall prepare for Owner's review and acceptance prior to commencement of work on the Site, for purposes of contract administration, a schedule of submittals (also referred to as a submittal register) required to complete the Work, prepared by Contractor and accepted by Owner for contract administration. Schedule of submittals shall include, for each submittal: the specification or drawing reference requiring the submittal, if applicable; the material, item, or process for which the submittal is required; the submittal number and identifying title of the submittal; the Contractor's anticipated submission date and the approval need date.

B. Contractor shall update monthly the schedule of submittals to reflect actual submission and acceptance dates for submittals. Review by Owner of schedule of submittals does not excuse Contractor of obligation to supply, schedule and coordinate all submittals required by the Contract Documents.

C. Submit, at Contractor's expense, in digital format, the following items ("Submittals") required by the Contract:

1. Schedule of Shop Drawing and Sample Submittals
2. Safety Plans
3. Progress Schedules
4. Product Data Shop Drawings
5. Samples
6. Coordination Drawings
7. Quality Assurance Control Data
8. Machine Inventory Sheets
9. Installation, Operation, and Maintenance Manuals
10. Computer Programs
11. Project Record Documents

All submittals shall be digitally submitted unless prior exception is granted by the Town of Woodside.

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

A. Contractor shall review for compliance with Contract Documents, approve and submit to Owner Shop Drawings, Product Data, Samples and similar submittals required by Contract Documents.

B. Contractor shall schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Contractor shall include certifications to be submitted with the pertinent drawings at the same time.

C. Contractor shall coordinate scheduling, sequencing, preparing and processing of all submittals

with performance of work so that work will not be delayed by submittal processing.

D. Submittals shall specifically identify any Work depicted that does not conform to the Contract Documents.

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

A. After review by Owner of each Submittal, material will be returned to Contractor with actions defined as follows unless indicated otherwise in these General Conditions:

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

B. Make a complete and acceptable submittal at least by second submission. The Town reserves the right to deduct monies from payments due Contractor to cover additional costs of review beyond the second submission. Illegible submittal will be rejected and returned to Contractor for resubmission. Contractor shall be in breach of the Contract if Contractor's first resubmittal, following a Submittal which the Town determines falls within categories 3 or 4 above, does not fall within categories 1 and 2 above.

C. Owner's review will not constitute acceptance by Owner of any responsibility for the accuracy, coordination, or completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be Contractor's sole and exclusive responsibility including responsibility to back-check comments, corrections, and modifications from Owner's review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals. Contractor submission of any Submittal is a representation that Contractor has confirmed that the Submittal meets requirements of Contract Documents including, without limitation, conforming to structural space and access conditions at point of installation. Owner's review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Owner's review of Submittal, method of Work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Owner, or any officer or employee thereof. Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of Work or material and equipment so accepted. Owner's review shall be considered to mean merely that Owner has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials and equipment proposed.

D. Unless otherwise specified, Owner's review will not extend to the means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

F. Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the Owner has reviewed respective Submittal and the Work described in the Submittal is authorized

to proceed . Otherwise, any such Work is at Contractor's sole risk for removal and replacement, at Owner's sole discretion, and at Contractor's sole expense.

G. Submit complete initial Submittal for those items where required by individual Specification Sections. Complete Submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in Specification Sections, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial Submittal when complete Submittal is required, Submittal may be returned to Contractor without review.

H. Normally, Submittals will be processed and returned to Contractor within four (4) Days of receipt. Submittals received after 12:00 pm will be considered as received on the following Day. For Fridays, the following day will be considered to be Monday.

I. All submittal shall be number identified by Contractor, prior to submission to the Town, in accordance with the following:

1. Sequentially number each Submittal (i.e., "1", "2", "3", etc.) as the basis for number identification of Submittals.

2. Affix the Submittal number under which each Submittal is made on every copy of each Shop Drawing, product data, sample, certification, etc.

3. Number Installation, Operation, and Maintenance Manuals with original root number of the approved Submittal for the item.

4. If the Submittal is a resubmittal (including without limitation after an initial Submittal is rejected, returned without review or marked 'Revise as Noted and Resubmit'), add the suffix designation "A" (i.e., a resubmittal of Submittal 1 would be numbered 1A). Subsequent re-submittals would be identified by the Submittal number and sequential letters (i.e., "B", "C", "D", etc.).

5. All Submittals shall include all information requested by each Specification Section. No partial Submittals will be accepted unless previously authorized by the Town. In the event a partial Submittal is authorized, each subsequent different Submittal (as opposed to resubmittal) is given a new number.

6. Deliver Submittals to the Town at least 30 Days before dates reviewed Submittals will be needed. Contractor's failure to deliver Submittals within the identified time frame shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the Submittal.

7. Initial submittal of Installation, Operation, and Maintenance shall be 45 Days after the date submittals that pertain to the applicable portion of Installation, Operation, and Maintenance Manual is satisfactorily review.

Submittal transmittal form (digital and email) shall contain the following:

A. Date, revision date, and Submittal log number.
B. Project name and the Town's Project number.
C. Contractor's name, address, and job number.
D. Specification Section number clearly identified.
E. The quantity of Shop Drawings, Product Data, or Samples submitted.
F. Notification of deviations from Contract Documents.
G. Materials Safety Data Sheet (MSDS) for each item complying with OSHA's Hazard Communication Standard 29 CFR 1910.1200.
H. Other pertinent data.

Submittal shall contain the following:

A. Date and revision dates.
B. Revisions, if any, identified.
C. Project Name and Project number.
D. The names of:
E. Contractor, Subcontractor, Supplier, Manufacturer, and separate detailer, when pertinent.
F. Identification of product material by location within the Project.
G. Relation to adjacent structure or materials.
H. Field dimensions, clearly identified as such.
I. Specification Section number and applicable detail reference number on the Drawings.
J. Applicable reference standards.
K. A blank space, on each Drawing or data sheet, 5" x 4" for the Town's stamp.
L. Identification of deviations from Contract Documents.
M. Contractor's stamp, initialed or signed, with language certifying the review of Submittals, verification of field measurements, construction criteria and technical standards in compliance with Contract Documents.

Resubmission requirements:

A. Revise initial Shop Drawings as required and resubmit as specified for initial Submittals.
B. Indicate on Shop Drawings any changes that have been made other than those requested by the Town.
C. Submit new Product Data and Samples as required for initial Submittals.
D. Revise initial Installation, Operation, and Maintenance Manual(s) as required and resubmit as specified for initial Submittals.

Number of resubmissions:

One (1) reexamination of Contractor's Submittals that have been returned for correction or replacement will be included in the Town's budget. Any additional reexamination of Contractor's Submittals will be considered additional scope services to be paid by Contractor through the Town. Contractor shall pay Town (or Town may deduct from any progress or final payment), for engineering personnel, on an hourly basis at 2.5 times direct payroll expenses, and for consultant personnel time at 1.25 times the amount billed the Town

Schedule of Shop Drawing and Sample Submittals

A. Submit preliminary Schedule of Shop Drawing and Sample Submittals as required by Document 007200 (General Conditions). Submit two copies of final Schedule of Shop Drawings and Sample Submittals as required in this Document.

1. Preliminary and final Schedule of Shop Drawing and Sample Submittals will be used by the Town to schedule its activities relating to review of Submittals. Schedule of Submittals shall indicate a spreading out of Submittals and early Submittals of long-lead-time items and of items that require extensive review.

2. Preliminary Schedule of Shop Drawing and Sample Submittals will be reviewed by the Town and shall be revised and resubmitted within 7 days of receipt from Town until Town indicates resubmissions are not required. Once Town makes this indication, Contractor shall submit the final Schedule of Shop Drawing and Sample Submittals as indicated above.

3. Unless otherwise specified, make Submittals in groups containing all associated items to assure that information is available for checking each item when it is received. Identify on the Submittal which Submittals should be reviewed together.

Safety Program

Submit three (3) copies of Safety Program specific to these Contract Documents to the Town within 15 days after the Notice to Proceed is issued. The Town may provide comments to the Contractor on the Contractor's Safety Program; however, the Contractor remains solely responsible for its Safety Program. The Town will acknowledge Safety Program submission by stamping "In Receipt Of" or similar on the submittal.

Progress Schedule

A. Submit three (3) print copies of schedule at each of the following times:

1. Initial Progress Schedule at the Preconstruction Conference.
2. Original Schedule within 20 Days of the Notice to Proceed date.
3. Adjustments to the Schedule as required.
4. Schedule updates monthly, seven (7) Days prior to monthly progress meeting

Progress Schedule

A. Submit three (3) print copies of schedule at each of the following times:

1. Initial Progress Schedule at the Preconstruction Conference.
2. Original Schedule within 20 Days of the Notice to Proceed date.
3. Adjustments to the Schedule as required.
4. Schedule updates monthly, seven (7) Days prior to monthly progress meeting.

B. Submit four (4) copies of the reports listed in this document with:

1. Initial Schedule
2. Original Schedule
3. Each monthly Schedule update

C. Progress Schedules and Reports shall be submitted on a CD, DVD, USB, or other electronic storage device acceptable to the Town, using software described in this Document, in addition to hard copies specified in this paragraph. Electronic files shall be complete copies, including all programs and electronic coding

. **Product Data**

Within ten (10) Days after Start Date of the Contract Time, submit two (2) copies of complete list of major products proposed for use, with name of manufacturer, telephone number, trade name, and model number of each product. Tabulate product data by Specification Section.

For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and references standards.

Product or Catalog Data:

A. Manufacturer's standard drawings shall be modified to delete non-applicable data or include applicable data.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, charts, illustrations and other standard descriptive data:
   1. Mark each copy to identify pertinent materials, products, or models.
   2. Show dimensions and clearances required, performance characteristics and capacities, wiring diagrams and controls.
   3. Include applicable MSDS

Supplemental Data:

1. Submit number of copies that Contractor requires, plus two (2) copies that will be retained by the Town.
2. **MARK EACH COPY TO IDENTIFY APPLICABLE PRODUCTS, MODELS, OPTIONS, AND OTHER DATA. SUPPLEMENT MANUFACTURER'S STANDARD DATA TO PROVIDE INFORMATION UNIQUE TO PROJECT.**
3. Provide copies for project record documents described in this document.

Shop Drawings

A. Minimum Sheet Size: 8½ inches by 11 inches. All others: Multiples of 8½ inches by 11 inches, 34 inches by 44 inches maximum.

B. Original sheet or reproducible transparency will be marked with Town's review comments and returned to Contractor.

C. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.

D. Include manufacturers' installation instructions when required by Specification Section.

E. If Contractor submits Shop Drawings for items that Shop Drawings are not specified, Town will not be obliged to review them.

F. Contractor is responsible for procuring copies of Shop Drawings for its own use as it may require for the progress of the Work.

G. Shop Drawings shall be drawn to scale and completely dimensioned, giving plan view together with such sectional views as are necessary to clearly show construction detail and methods.

H. After Shop Drawings are approved contractor shall provide an electronic copy of them to the Town when requested.

Samples

A. Submit full range of manufacturers' standard colors, textures, and patterns for Town's selection.

B. Submit samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Coordinate Submittal of different categories for interfacing work.

C. Include identification on each sample, giving full information.

D. Sizes: Unless otherwise specified, provide the following:
   1. Paint Chips: Manufacturers' standard
   2. Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
   3. Linear Products: Minimum 6 inches, maximum 12 inches long
   4. Bulk Products: Minimum 1 pint, maximum 1 gallon

E. Full size samples may be used in Work upon approval by the Town.

F. Field Samples and Mock-ups (if applicable):
   1. Erect field samples and mock-ups at Site in accordance with requirements of Specification Sections. If testing is conducted, record and certify results and full Contract compliance.
   2. Modify or make additional field samples and mock-ups as required to provide appearance and finishes approved by Town.
   3. Approved field samples and mock-ups may be used in Work upon approval by Town.
   4. Construct or prepare as many additional Samples as may be required, as directed by the Town, until desired textures, finishes, and/or colors are obtained.
   5. Accepted Samples and mock-up shall serve as the standard of quality for the various units of work.

G. No review of a Sample shall be taken in itself to change or modify the requirements in the Contract Documents.

H. Finishes, materials, and workmanship in the completed Work shall match accepted Samples

Quality Assurance Control Submittals

A. Test Reports:

Submit three (3) copies; One copy will be marked with Town's review comments and returned to Contractor.

Indicate that material or product conforms to or exceeds specified requirements.

Reports may be from recent or previous tests on material or product, but shall be acceptable to Town.

Comply with requirements of each individual Specification Section.

B Certificates:

Submit five (5) copies; One copy will be marked with Town's review comments and returned to Contractor.

Indicate that material or product conforms to or exceeds specified requirements.

Submit supporting reference data, affidavits, and certifications as appropriate.

Certificates may be recent or from previous test results on material or product, but shall be acceptable to the Town.

C. **Manufacturer's Instructions**

Submit three (3) copies; One copy will be marked with Town's review comments and returned to Contractor. Include manufacturers' printed instructions for delivery, storage,

assembly, installation, startup, adjusting, and finishing. Identify conflicts between manufacturers' instructions and Contract Documents.

D. **Material Safety Data Sheets:**

In addition to Material Safety Data Sheets (MSDS) otherwise required by the Contract Documents, submit five (5) copies for any paints, solvents, thinners, varnish, lacquer, glues and adhesives, mastics, or other materials needed for the Project as required by the individual Specification Sections or as otherwise specified in the Contract Documents.

MSDS required for a Submittal shall be submitted with product data in order for the Submittal to be reviewed.

E. Installation, Operations and Maintenance Manuals

Sheet Size: 8½ x 11 inch

Drawing Size: Reduce drawings or diagrams to an 8½ x 11 inch or 11 x 17 inch size. However, where reduction is not practical to ensure readability, fold larger drawings separately and place in vinyl envelopes bound into the binder. Identify vinyl envelopes with drawing numbers.

Binding: Bind in stiff, metal-hinged, three-ring binder(s) with standard three-hole punching.

Multiple Items: Multiple items may be combined into one (1) binder; tab each section with plastic-coated dividers.

Page Protectors: Provide plastic sheet lifters prior to first page and following last page.

Binder title: Include the following title on front and spine of binder:

PROJECT TITLE

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL, 201__

Contents:

1. Introductory Information:
   - a. Title page providing the same information as paragraph 0 above
   - b. Contractor's name, address, and telephone number
   - c. Table of Contents
2. Include, at a minimum, the following detailed information for each item as applicable and as required by individual Specification Sections:
   - a. Equipment function, normal operating characteristics, limiting operations.
   - b. Assembly, disassembly, installation, alignment, adjustment, and checking instructions.
   - c. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions.
   - d. Lubrication and maintenance instructions including specific type and amount of lubricant and recommended lubrication interval.
   - e. Guide to "troubleshooting."
   - f. Parts list and predicted life of parts subject to wear.
   - g. Outline, cross-section, and assembly drawings; engineering data; and electrical diagrams, including elementary diagrams, labeled wiring

diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.

h. Test data and performance curves.

i. A list of recommended spare parts with a price list and a list of spare parts provided under this Contract.

j. Copies of parts lists or other documents packed with equipment when delivered.

k. Instrumentation or tag numbers relating the equipment back to the Contract Documents.

l. Index

3. Final Submittal: Upon favorable review of Installation, Operation, and Maintenance Manual(s) by the Town, deliver nine (9) additional hard copies and one (1) electronic media format copy of the final approved Installation, Operation, and Maintenance Manual(s). Electronic media format copy shall include all tables, charts, drawings, codes and all other matters reflected in hard copies. The Town utilizes various media for records-keeping and facilitating maintenance functions.

4. Electronic Media Format: Compatible with Town's current software. All files shall be delivered on a unique CD, DVD, USB or other electronic storage device acceptable to the Town of Woodside.

5. Draft Submittal: The Draft Submittal of Installation, Operation and Maintenance Manuals shall be submitted to the Town prior to equipment startup.

F. Project Record Documents

Submit one copy of each of the Project Record Documents listed in these Documents.

G. Delay of Submittals

Delay of Submittals by Contractor is considered avoidable delay. Liquidated damages incurred because of late Submittals will be assessed to Contractor.

H. Optional Review Meeting

At the Contractor's request, in order to facilitate the timeliness of the review process, the City may schedule a meeting to review the materials submitted. If this option is exercised, the following requirements apply:

Request a meeting date with the Town at least five (5) Business Days in advance.

Provide the complete package of submittal information at least five (5) Business Days in advanced of the meeting.

The meeting shall take place at Town's office. Town will provide the authorized staff to review and respond on the submittal information during the meeting.

Make available for this meeting the job superintendent and/or foreman, Contractor's safety officer, and someone knowledge of all the items submitted and authorized to make substitutions or changes.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. **Section includes:**

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

1.02 GENERAL

A. **Compliance with Laws**

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

B. **Precedence**

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

1.03 REGULATORY REQUIREMENTS

A. **Applicable Codes**

1. Codes that apply to Contract Documents include all Codes applicable to construction, including**, WITHOUT LIMITATION,** the following:

   a. California Building Code (2013 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.

b. California Electrical Code (2013 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
c. California Plumbing Code (2013 Edition or latest applicable code) as amended by applicable local ordinances for plumbing, sewage disposal and health requirements.
d. California Mechanical Code (2013 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
e. California Fire Code (2013 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
f. California Administrative Code Titles 15, 19 and 24 (with California amendments), and Americans with Disabilities Act (ADA) accessibility guidelines, whichever is more stringent.
g. All State laws and Town and County Ordinances, rules of the State or Town or County Health Departments, rules of the National Board of Fire Underwriters and National Fire Protection Associations, and local power company regulations for mechanical and electrical work.

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

1. During prosecution of Work to be done under Contract Documents, Contractor shall comply with applicable laws, ordinances, rules and regulations including, without limitation, the following:

a. <u>Federal:</u>

1) Americans With Disabilities Act of 1990
2) 29 CFR, Section 1910.1001, Asbestos
3) 40 CFR, Subpart M, National Emission Standards for Asbestos
4) Executive Order 11246
5) Federal Endangered Species Act
6) Clean Water Act

b. <u>State of California:</u>

1) Code of Regulations, Titles 5, 8, 17, 19, 21, 22, 24 and 25
2) Public Contract Code
3) Health and Safety Code
4) Government Code
5) Labor Code
6) Civil Code
7) Code of Civil Procedure
8) CPUC General Order 95, Rules for Overhead Electric Line Construction
9) CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
10) Cal/OSHA
11) OSHA: Hazard Communications Standards
12) California Endangered Species Act
13) Water Code
14) Fish and Game Code

c. <u>State of California Agencies:</u>

1) State and Consumer Services Agency
2) Office of the State Fire Marshall
3) Office of Statewide Health Planning and Development (if applicable)
4) Department of Fish and Game
5) All Air Quality Management Districts with jurisdiction
6) All Regional Water Quality Control Boards with jurisdiction
7) Division of the State Architect (if applicable)

d. All Local Agencies with jurisdiction (cities, counties, fire departments)

C. **Change Orders and Claims:**

1. The Public Contract Code including, without limitation, Section 7105(d)(2), and the California Government Code Section 930.2, et seq., apply to all contract procedures for changes, time extensions, change orders (time or compensation) and claims. Federal law (*U.S. v. Holpuch* 326 U.S. 234) shall supplement California law on the enforceability of these requirements.
2. Any change, waiver, or omission to implement contract change order and claim procedures shall have no legal effect unless expressly permitted in a fully executed change order approved by Contractor and Owner and approved as to form by their respective legal counsel.

D. **Required Provisions On Contract Claim Resolution**

1. Public Contract Code Section 201014, et seq., specifies required provisions on resolving contract claims less than $375,000, which are set forth below, and constitute a part of this Contract.
2. For the purposes of this section, "Claim" means a separate demand by Contractor of $375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by Owner. In order to qualify as a Claim, the written demand must state that it is a Claim submitted under Article 12 of Document 00 7200 (General Conditions) and be submitted in compliance with all requirements of Document 00 7200 (General Conditions), Article 12. Separate Contractor Claims that together total more than $375,000 do not qualify as a "separate demand of $375,000 or less," as referenced above, and are not subject to this section.
3. A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in compliance with Contract Documents claim submission requirements.
4. Caution. This section does not apply to tort claims, and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.
5. Procedure:

   a. The Claim must be in writing, submitted in compliance with all requirements of Document 00 7200 (General Conditions), Article 12, including, without limitation, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Document 00 7200 (General Conditions), paragraph 12.02. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 00 7200 (General Conditions), Article 12 or elsewhere in the Contract Documents.
   b. For Claims of fifty thousand dollars ($50,000) or less, Owner shall respond in writing within forty-five (45) days of receipt of the Claim, or Owner may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Owner may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section upon mutual agreement of Owner and Claimant. Owner's written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

c. For Claims over Fifty Thousand Dollars ($50,000) and less than or equal to $375,000: Owner shall respond in writing within sixty (60) days of receipt of the Claim, or Owner may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Owner may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Owner and Claimant; Owner's written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

d. Meet and Confer: If Claimant disputes Owner's written response, or Owner fails to respond within the time prescribed above, Claimant shall notify Owner, in writing, either within fifteen (15) days of receipt of Owner's response or within fifteen (15) days of Owner's failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand Owner will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

e. Following the meet and confer conference, if the Claim or any portion remains in dispute, Claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Claimant submits its written claim as set forth herein, until the time that Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

E. **Compliance With Americans With Disabilities Act**

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

F. **Compliance With IRCA**

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

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4200

REFERENCES AND DEFINITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. **Section Includes:**

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

1.02 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES

A. **References**

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

B. **Precedence**

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

C. **Referenced Grades, Classes, and Types:**

1. Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the highest, best, and greatest of the alternatives or options for the intended use and prevailing conditions.

D. **Edition Date of References:**

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

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

1.03 DEFINITIONS

A. **Meaning of Words and Phrases**

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

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

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

7. Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.

8. Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.

9. Bidder: One who submits a Bid.

10. Bidding Documents: All documents comprising the Project Manual (including all documents and Specification Sections listed in Document 00 0110 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.

11. Board: The governing body of the Owner.

12. Business Day: Any Day other than Saturday, Sunday, and the following days that have been designated as holidays by Owner. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday.

    a. New Year's Day, January 1;
    b. Martin Luther King Jr.'s Birthday, third Monday in January;
    c. Lincoln's Birthday, February 12;
    d. Presidents' Day, third Monday in February;
    e. Memorial Day, last Monday in May;
    f. Independence Day, July 4;
    g. Labor Day, first Monday in September;
    h. Veterans' Day, November 11;
    i. Thanksgiving Day, as designated by the President;
    j. The Day following Thanksgiving Day;
    k. Christmas Day, December 25; and
    l. Each day appointed by the Governor of California and formally recognized by the Governing Board as a day of mourning, thanksgiving, or special observance.

13. By Owner: Work that will be performed by Owner or its agents at the Owner's expense.

14. By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by Owner, other contractors, or other means.

15. Change Order: A written instrument prepared by Owner and signed by Owner and Contractor, stating their agreement upon all of the following:

    a. a change in the Work;
    b. the amount of the adjustment in the Contract Sum, if any; and
    c. the amount of the adjustment in the Contract Time, if any.

16. Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.

17. Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.

18. Construction Change Directive (**CCD**): A written order prepared and signed by Owner, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.

19. Contract Amount: a change order price, line item price, Contract Sum, or other price assigned to a scope of work.

20. Contract Conditions or Conditions of the Contract: Consists of two parts: General Conditions and Supplementary Conditions.

    a. General Conditions are general clauses that are common to the Owner Contracts, including Document 00 7200 (General Conditions).

b. Supplementary Conditions modify or supplement General Conditions to meet specific requirements for Contract Documents, including Documents 00 7300, *et seq.* (Supplementary Conditions).

21. Contract Documents and Contract: Contract Documents and Contract shall consist of the documents identified as the Contract Documents in Document 00 5200 (Agreement), plus all changes, Addenda, and modifications thereto.

22. Contract Modification: Either:

    a. a written amendment to Contract signed by Contractor and Owner; or
    b. a Change Order; or
    c. a Construction Change Directive; or
    d. a written directive for a minor change in the Work issued by Owner.

23. Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by Owner to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.

24. Contract Time: The number or numbers of Days or the dates stated in the Agreement to achieve Substantial Completion of the Work or designated Milestones; and/or to achieve Final Completion of the Work so that it is ready for final payment and is accepted.

25. Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term "Contractor" means the Contractor or its authorized representative.

26. Contractor's Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.

27. County: The County in which Owner is located.

28. Day: One calendar day of 24 hours measured from midnight to the next midnight, unless the word "day" is specifically modified to the contrary.

29. Defective: An adjective which, when modifying the word "Work," refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including, without limitation, approval of Samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Owner). Unapproved substitutions are defective. Owner is the judge of whether Work is Defective.

30. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

31. Equal: Equal in opinion of Owner. Burden of proof of equality is responsibility of Contractor.

32. Final Acceptance or Final Completion: Owner's acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final Completion include, but are not limited to:

    a. Final cleaning is completed.
    b. All systems having been tested and accepted as having met requirements of Contract Documents.
    c. All required instructions and training sessions having been given by Contractor.
    d. All Project Record Documents having been submitted by Contractor, reviewed by Owner, and accepted by Owner.
    e. All punch list Work, as directed by Owner, having been completed by Contractor.
    f. Generally all Work, except Contractor maintenance after Final Acceptance/Final Completion, having been completed to satisfaction of Owner.

33. Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
34. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
35. Furnish: Supply only, do not install.
36. Indicated: Shown or noted on the Drawings.
37. Install: Install or apply only, do not furnish.
38. Latent: Not apparent by reasonable inspection including, without limitation, the inspections and research required as a condition to bidding under Document 00 7200 (General Conditions).
39. Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions.
40. Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
41. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
42. Modification: Same as Contract Modification.
43. Not in Contract or "NIC": Work that is outside the scope of Work to be performed by Contractor under Contract Documents.
44. Notice of Completion: Shall have the meaning provided in California Civil Code Section 9202, and any successor statute.
45. Off Site: Outside geographical location of the Project.
46. Owner: Owner is defined in Document 00 5200 (Agreement).
47. Owner-Furnished, Contractor Installed: Items furnished by Owner at its cost for installation by Contractor at its cost under Contract Documents.
48. Owner's Representative(s): See Document 00 5200 (Agreement).
49. Partial Utilization: Use by Owner of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.
50. PCBs: Polychlorinated biphenyls.
51. Phase: A specified portion of the Work (if any) specifically identified as a Phase in Document 00 5200 (Agreement) or Section 01 1100 (Summary).
52. Product Data: That information (brochures, catalog sheets, manufacturer's cut sheets, etc.) supplied by vendors having technical and commercial characteristics of the supplied equipment or materials and accompanying commercial terms such as warranties, instructions, and manuals.
53. Progress Report: A periodic report submitted by Contractor to Owner with progress payment invoices accompanying progress schedule. See Document 00 7200 (General Conditions).
54. Project: Total construction of which Work performed under Contract Documents may be whole or part.
55. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, Drawings, and Specifications.

56. Project Record Documents: All Project deliverables required under the Contract Documents, including without limitation, as built drawings; Installation, Operation, and Maintenance Manuals; and Machine Inventory Sheets.
57. Proposal: A Bid.
58. Provide: Furnish and install.
59. Request for Information (**RFI**): A document prepared by Contractor requesting information regarding the Project or Contract Documents. The RFI system is also a means for Owner to submit Contract Document clarifications or supplements to Contractor.
60. Request for Proposals (**RFP**): A document issued by Owner to Contractor whereby Owner may initiate changes in the Work or Contract Time as provided in Contract Documents.
61. Request for Substitution (**RFS**): A document prepared by Contractor requesting substitution of materials as permitted and to the extent permitted in Contract Documents.
62. RFI-Reply: A document consisting of supplementary details, instructions, or information issued by Owner that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by Owner. RFI-Replies will be issued through the RFI administrative system.
63. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
64. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
65. Shown: As indicated on Drawings.
66. Site: The particular geographical location of Work performed pursuant to the Contract Documents.
67. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services.
68. Specified: As written in Specifications.
69. Subcontractor: A person or entity that has a direct contract with Contractor to perform a portion of the Work at the Site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and neutral in gender and means a Subcontractor or an authorized representative of the Subcontractor. The term Subcontractor does not include a separate contractor or subcontractors of a separate contractor.
70. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of Owner as evidenced by a notice or certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended, and unperformed or incomplete work elements are minor in nature; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of Owner for final payment. The terms **"Substantially Complete"** and **"Substantially Completed"** as applied to all or part of the Work refer to Substantial Completion thereof.
71. Supplemental Instruction: A written directive from Owner to Contractor ordering alterations or Modifications that do not result in change in Contract Sum or Contract Time, and do not substantially change Drawings or Specifications.
72. Technical Specifications: Specification Sections included within Division 02 and above.
73. Testing and Special Inspection Agency: An independent entity engaged to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of

buildings, to determine if such construction complies with the Contract Documents and applicable codes.

74. TIE: Time Impact Evaluation; see Section 01 2600 (Modification Procedures). May also be referred to as Time Impact Analysis (**TIA**).

75. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems, or water.

76. Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Document 00 5200 (Agreement) or Section 01 1100 (Summary).

77. Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word "work" is used, rather than the word "Work," it shall be understood to have its ordinary and customary meaning.

B. **Other Defined Terms**

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

1. Wherever words "as directed," "as required," "as permitted," or words of like effect are used, it shall be understood that direction, requirements, or permission of Owner is intended. Words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary, or proper in judgment of Owner. Words "approved," "acceptable," "satisfactory," "favorably reviewed," or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by Owner.

2. Wherever the word "may" or "ought" is used, the action to which it refers is discretionary. Wherever the word "shall" or "will" is used, the action to which it refers is mandatory.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 Summary.

A. Section describes requirements and procedures for:

1. Project cleaning
2. Testing of equipment and systems
3. Substantial Completion
4. Final Completion
5. Close Out
6. Warranties

1.02 Substantial Completion.

A. Removal of Temporary Construction Facilities and Project Cleaning.

1. Prior to Substantial Completion inspection: remove temporary materials, equipment, services, and construction; clean all areas affected by the Work; clean and repair damage caused by installation or use of temporary facilities; restore permanent facilities used during construction to specified condition.

B. Equipment and Systems.

1. Prior to Substantial Completion, Contractor shall start up, run for periods prescribed by Owner, operate, adjust and balance all manufactured equipment and Project systems including, without limitation, mechanical, electrical, safety, fire, and controls.
2. Demonstrate that such equipment and systems conform to contract standards and manufacturer's guarantees. Where applicable, use testing protocols specified, and if the contract is silent, then consistent with manufacturer's recommendations and industry standards.

C. Procedure for Substantial Completion.

1. When Contractor considers Work or designated portion of the Work as Substantially Complete, submit written notice to Owner, with list of items remaining to be completed or corrected and explanation of why such items do not prevent Owner's beneficial use and occupancy of the Work for its intended purposes. Within reasonable time, Owner will inspect to determine status of completion.
2. Should Owner determine that Work is not Substantially Complete, Owner will promptly notify Contractor in writing, listing all defects and omissions. Contractor shall remedy deficiencies and send a second written notice of Substantial Completion. Owner will re-inspect the Work. If deficiencies previously noted are not corrected on re-inspection, then pay the cost of the re-inspection.
3. When Owner concurs that Work is Substantially Complete, Owner will issue a written notice or certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified by Owner.
4. Manufactured units, equipment and systems that require startup must have been started up and before a notice or certificate of Substantial Completion will be issued.
5. A punch list examination will be performed upon Substantial Completion. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, Contractor will reimburse Owner for costs associated with these visits.

1.03 Final Completion.

A. Requirements.

1. Final Completion occurs when Work meets requirements for Owner's Final Acceptance.

B. Procedure.

1. When Contractor considers Work is Finally Complete, submit written certification that:
   (a) Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
   (b) Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of Owner, and are operative.
   (c) Project Record Documents are completed and turned over to Owner, and Work is complete and ready for final inspection.
2. In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
3. Should Owner determine that Work is incomplete or Defective, Owner promptly will so notify Contractor, in writing, listing the incomplete or Defective items. Contractor shall promptly remedy the deficiencies and notify the Owner when it is ready for re-inspection.

C. Final Adjustments of Accounts.

1. Submit a final statement of accounting to Owner, showing all adjustments to the Contract Sum and complete and execute Document 00 6530 (Agreement and Release of Claims).
2. If so required, Owner shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

D. Warranties.

1. Execute Contractor's Submittals and assemble warranty documents, and Installation, Operation, and Maintenance Manuals, executed or supplied by Subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in 8½ inches by 11 inches three-ring binder with durable plastic cover, appropriately separated and organized. Assemble in Specification Section order.
2. Submit material prior to final Application for Payment. For equipment put into use with Owner's permission during construction, submit within 14 Days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated Submittal within 14 Days after acceptance, listing date of acceptance as start of warranty period.
3. Warranty Forms: Submit drafts to Owner for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents. Warranty shall be countersigned by manufacturers. Where specified, warranty shall be countersigned by Subcontractors and installers.
4. Rejection of Warranties: Owner reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.
5. Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one year minimum from date of Final Completion of entire Work except where:
   (a) Detailed Specifications for certain materials, equipment or systems require longer warranty periods.
   (b) Materials, equipment or systems are put into beneficial use of Owner prior to Final Completion as agreed to in writing by Owner.

E. Warranty of Title.

1. No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to Owner free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of Owner.

F. Turn-In. Contract Documents will not be closed out and final payment will not be made until all keys issued to Contractor during prosecution of Work and letters from property owners, pursuant to Contract Documents, are turned in to Owner.

G. Release of Claims. Contract Documents will not be closed out and final payment will not be due or made until Document 00 6530 (Agreement and Release of Claims) is completed and executed by Contractor and Owner.

H. Fire Inspection Coordination. Coordinate fire inspection and secure sufficient notice to Owner to permit convenient scheduling (if applicable).

I. Building Inspection Coordination. Coordinate with Owner a final inspection for the purpose of obtaining an occupancy certificate (if applicable).

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION

TECHNICAL SPECIFICATIONS

For

Town Center Sewer Pump Station Improvements

Richard K. Tanaka
Mark Thomas & Company, Inc.
Registered Professional Engineer No. C23233
Expires 03/31/2017

REGISTERED PROFESSIONAL ENGINEER
RICHARD TANAKA
No. 23233
Exp. 03/31/17
CIVIL
STATE OF CALIFORNIA

Technical Specification

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SECTION 00 1000 – FIELD ENGINEERING & SURVEY WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section includes specifications for survey services for layout of the Work and for field measurement of work quantities to be determined by surveys.

B. This Section includes the responsibilities of the Contractor and the Town respectively, in terms of survey services.

C. Drawings, Divisions 0 & 1, including Doc. 007200 General Conditions and the technical specifications apply to this Section.

1.02 LINES AND GRADES

A. All control monuments, bench marks, stakes or markers required to establish the lines and grades required for the completion of the Work shall be the responsibility of the Contractor. These would include, but are not limited to, primary horizontal and vertical control, secondary horizontal and vertical control, rough grade, slope stakes, topographic surveys for quality calculations, and construction surveys for layout of civil improvements.

1.03 SURVEYS FOR LAYOUT AND PERFORMANCE

A. General: Town of Woodside will provide the following construction staking:

a. 25 foot interval for sanitary sewer mains.
b. One set of stakes for manholes, wet well, clean out and utility box
c. One set of stakes for PCC concrete pad
d. One set of stakes for Timber Lagging Wall
e. One set of stakes for Sewer Main

B. Contractor will be responsible for all other layout required for the project, including but not limited to re-staking, additional layout staking if required by the Contractor for construction, striping layout, stage construction and traffic handling at no cost to the Town.

1.04 PARKING

A. Contractor will not be allowed to have a trailer, storage and/or parking within the Town's street right of way. Contractor may secure a private site for their use at no cost to the Town. Contractor's temporary storage of materials and construction equipment is limited to the construction area as approved by the Town.

B. If construction site parking is not available for Contractor's workers and construction management personnel then workers and CM personnel may park vehicles at Town Hall parking lot or the street adjacent to or near the project site, without blocking residential/business driveways and access, or elsewhere offsite.

C. Contractor shall utilize an area approved by the Town of Woodside for parking spaces.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

A. Contractor shall notify Engineer 48 hours prior to the required staking for Contractor to commence work.

PART 4 – MEASUREMENT AND PAYMENT

No separate payment will be made this item of work.

END OF SECTION 00 1000

SECTION 00 1100 - TREE PROTECTION AND BIOLOGICAL MONITORING

PART 1 - GENERAL

1.01 SUMMARY

A. RELATED DOCUMENTS

1. Drawings, Divisions 0 & 1, including Doc. 007200 General Conditions and the technical specifications apply to this Section.

2. Town of Woodside Protected Trees, Town of Woodside Section 153.170 Tree Ordinance No. 2006-534 and Sustainability and Conversation Committee

3. Town of Woodside, Standards for Protection of Trees during Grading and Construction Operations

4 Biological Constraints Analysis Report, dated June 17, 2015 is incorporated by reference herein. A copy of the report is available at the Town Hall.

B. DESCRIPTION OF WORK

A. Protection and operational requirements of working around existing vegetation, as shown on the plans, to include, but not be limited to, the following:

a. Existing Tree Protection (above and below ground portions)

b. Protective Fencing and Signage if required

d. Tree Root Management

e. Town of Woodside will retain an Arborist and Biologist during the construction phase of the Project at no expense to the Contractor to monitor and oversee construction activities as it relates to biological and tree impacts.

1.02 SUBMITTALS

A. General: Submit under the provisions of Document 007200, General Conditions, and Submittals.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL TREE PROTECTION

Contractor shall notify the Engineer three (3) full Working Days in advance of any work requiring digging around or within the drip-line of existing trees. No cutting of any part of any tree, including roots, shall be done without securing approval and direct supervision from the Engineer.

3.02 BIOLOGICAL MONITORING

Contract plans include details of the biological monitoring requirements. Refer to Contract Plans.

PART 4 – MEASUREMENT AND PAYMENT

Measurement and Payment for tree protection as required will not be made separately, but shall be considered to be included in the various contract items of work. Town will provide biological monitoring at no cost to the contractor. No separate payment will be made for coordination as required, except in the event of project shut-down. Refer to general requirements of these specifications.

END OF SECTION 00 1100

SECTION 00 1200 - PROTECTION OF ADJACENT IMPROVEMENTS AND UTILITIES

PART 1– GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Divisions 0 & 1, including Doc. 007200 General Conditions and the technical specifications apply to this Section.

1.02 DESCRIPTION OF WORK

A. This Section includes requirements for coordination with and protection of existing utilities.

B. Locate and protect from damage existing utilities and other facilities that are to remain in place and existing utilities and other facilities that are to be relocated by others.

C. Protect from damage new utilities and other facilities installed within the area of the Work during or prior to the Contract.

D. Protect from damage any and all existing improvements to remain in place.

1.03 LOCATION AND PROTECTION OF EXISTING UTILITIES

A. Existing utilities indicated on the Contract Drawings are approximate location based on record information. Additional utilities may exist. Locate and identify all underground structures, facilities, and piping prior to commencing any Work which may compromise said utilities. Maintain existing utilities and protect from damage as necessary to satisfy the requirements of jurisdictional utility companies and related codes and regulations. Refer to potholing specified elsewhere in this Section for additional requirements in regard to locating utilities. Refer to General Conditions for requirements for locating facilities not shown or facilities in a different location from that indicated.

B. Do not disconnect or shut down any part of the existing utilities and services, except by permission of authorities having jurisdiction. Submit schedule of estimated shut-down time in order to obtain such permission, and notify all interested parties, neighbors, utilities, and municipal and county authorities, as required.

C. Utilities to be removed shall not be removed until shut-down time can be kept to a minimum. Do not remove an existing utility line or service until the replacement line, crossover, or capping is ready to be performed.

D. Provide shoring, underpinning, and structural support for existing utility lines and structures which become suspended or otherwise unsupported because of adjacent excavation operations. The Contractor shall submit to the Engineer a detailed layout showing the shoring, bracing and sloping design (including calculations) to be made for worker protection from hazard of caving ground during the excavation. A Civil or structural engineer registered in California shall prepare and sign any plan that varies from shoring system standards established by the State Construction Safety Orders.

E. Excavate, including potholing, in proximity of existing underground facilities using methods as required by the utility companies and as specified, whichever is more protective of utilities.

F. Protect active underground utilities from damage. If underground utilities are damaged in any way, notify the Owner and affected utilities immediately for corrective action. In case of emergency involving utilities which participate in the Underground Service Alert-Northern California (USA) at 1-800-227-2600 and notify the Owner of the assigned ID number or emergency issue. Comply with instructions of affected utility company and pay all expenses of repair made in connection with such damages.

1.05 NOTIFICATIONS AND POTHOLING FOR EXISTING UTILITIES

A. Notify, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure, the Underground Service Alert-Northern California (USA) at 1-800-227-2600, and utility companies that do not participate in USA which have underground facilities within the limits of the work. Notify USA at least 2 working days, but not more than 14 calendar days prior to performing excavation or other work close to underground facility. Notify other utility companies in accordance with each utility's notification requirements. Have USA and other utility companies locate and mark their facilities within the area of excavation or other work. Maintain such markings in accordance with utility requirements, i.e. have markings renewed, as applicable.

B. Potholing for Utilities and Other Facilities: Prior to any excavation or other subsurface work, excavate, expose, and verify the location of existing utility mains and laterals and other existing underground facilities which may be affected by the Work.

1. At a minimum, pothole and accurately locate the following:

All marked or inferred facilities located with less than five (5) feet of clearance to the nearest point of proposed trenching, excavation, shoring, pile or other subsurface temporary or permanent facility

2. Survey and record the size, location, elevation, and alignment of potholed existing underground utilities and other facilities for inclusion in as-built drawings.

C. Do not proceed with excavation or other subsurface work until surrounding utilities and underground facilities have been located by potholing or other positive means. Determine the method and equipment required to perform potholing without damage to existing facilities. At minimum, utilize hand digging in the vicinity of high risk utilities and where recommended by USA guidelines.

PART 2 & 3 – PRODUCTS (NOT USED)

PART 4 – MEASUREMENT AND PAYMENT

Measurement and Payment for protection of existing improvements and utilities and potholing as required will not be made separately, but shall be considered to be included in the various contract items of work involved.

END OF SECTION 00 1200

SECTION 00 1300 - TEMPORARY BYPASS PUMPING SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Stage construction shown on the plans is one method of construction phasing. Contractor may propose separate construction staging plan to the Town for review and approval. This section includes requirements for implementing a temporary pumping system for the purpose of diverting existing sewage flow around work area. Bypass pumping shall consists of furnishing and maintaining all power, primary and standby pumps, appurtenances and bypass piping required to maintain existing flows around portions of existing gravity sewers being repaired, replaced, or rehabilitated of stage 1, 2 and 3 . All flow shall be pumped around segment during the installation of the new sewer, sewer connections or reconnections, and the replacement of sewer manhole, or wet well. The Contractor shall be responsible for providing a bypass system adequate to bypass all flows around the work site.

Contractors shall be responsible for all sewage pumping and any spills that may occur for any reason including, but not limited to, equipment failure, clogging, hose or pipe breakage, or high flows.

The design, installation, and operation of the temporary bypass pumping system shall be the Contractor's responsibility. The Contractor shall employ services of a subcontractor who can demonstrate to the Town that he specializes in the design and operation of temporary bypass pumping facilities. The subcontractor shall provide at least five references of projects a similar size and complexity of this project performed by his firm within the past 3 years. The bypass system shall meet the requirements of all codes and regulatory Agencies having jurisdiction, including the Town of Woodside

1.2 QUALITY ASSURANCE

A. Follow national standards and as specified herein.

B. Perform leakage and pressure tests on discharge piping using clean water, before operation. Notify Engineer 24 hours prior to testing.

C. Maintain and inspect temporary pumping system every two hours. Responsible operator: on site when pumps are operating.

D. Keep and maintain spare parts for pumps and piping on site, as required.

E. Maintain adequate hoisting equipment and accessories on site for each pump.

1.3 SUBMITTALS

A. General: Submit under the provisions of Section 00 7200, Division 1 General Requirements.

B. The Contractor and his/her subcontractor shall prepare a specific, detailed description of the proposed pumping system and the Vendor's references with his bid proposal.

C. Submit following

1. Detailed plan and description of proposed pumping system. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flow at least two weeks prior to pipe installation. The plan must be specific and complete, including such items as schedules, size, location, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping location from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents. The plan shall include but not limited to details of the following:
    a. Size and location of manhole or access points for suction and discharge hose or piping.
    b. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried
    c. Temporary pipe supports and anchoring required.
    d. Thrust and restraint block sizes and locations.
    e. Sewer plugging method and type of plugs.
    f. Bypass pump sizes, capacity, number of each size to be on site and power requirements.
    g. Backup pump, power and piping equipment.
    h. Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range.
    i. Design plans and computation for access to bypass pumping locations indicated on drawings.
    j. Calculations for selection of bypass pumping pipe size.
    k. Method of noise control for each pump and/or generator.
    l. Method of protecting discharge manholes or structures from erosion and damage.
    m. Schedule for installation and maintenance of bypass pumping lines.
    n. Procedures to monitor upstream mains for backup impacts.
    o. Procedures for setup and breakdown of pumping operations.
    p. Standby power generator and size and location
    q. Fully redundancy of equipment has sufficient capacity to pump the peak flow.
    r. Plan showing the staging area for pumps and fencing
    s. Personnel attendance schedule.
    t. The Contractor shall meet with Town of Woodside to confirm their requirements. Proof of this meeting and documentation of requirements shall be submitted to the Town.
    u. Emergency plan detailing procedures to be followed in event of pump failures, sewer overflows, service backups, and sewage spillage.

        1) Maintain copy of emergency plan on site for duration of project.

2. Certify bypass system will meet requirements of codes, and regulatory agencies having jurisdiction.

3. The Contractor shall notify the Engineer and the Town two (2) working days prior to commencing the bypass pumping operation. No construction for the sewage bypass system shall commence until all work has been reviewed and approved by the Town Engineer.

1.4 CONTRACTORS RESPONSIBILITY FOR OVERFLOWS AND SPILLS

A. Schedule and perform work in manner that does not cause or contribute incidence of overflows, releases or spills of sewage from sanitary sewer system or bypass operation.

1.5 DELIVERY AND STORAGE

A. Transport, deliver, handle, and store pipe, fittings, pumps, ancillary equipment and materials to prevent damage and following manufacturer's recommendations.

1. Inspect all material and equipment for proper operation before initiating work.

B. Material found to be defective or damaged due to manufacturer or shipment.

1. When Engineer deems repairable: Repair as recommended by manufacturer. When Engineer deems not repairable: Replace as directed by Engineer before initiating work.
2. Repair or replacement of defective or damaged material and equipment will be at no cost to Commission.

1.6 COORDINATION

A. The Contractor shall schedule any gravity sewer down-time with the Town of Woodside Sewer Operation personnel and the Engineer prior to removing any of the existing facilities from service.

B. All pumping or by-passing working, the arrangement or layout of the pumping and by-passing facilities, and the facilities to be utilized in such work shall be approved prior to the time said pumping and by-passing work is started.

C. Once all of the required repair, rehabilitation, and replacement work is completed, the Contractor shall coordinate placing the new sewer in service with the Town of Woodside Sewer Operations personnel and the Engineer.

D. Bypass pumping must be monitored with Contractor personnel at all times. If pumping operation continues pass normal working hours, the pumps shall be monitored 24 hours a day onsite as long as the operation is in place.

1.7 RESTORATION

A. The Contractor shall provide complete restoration including, but not limited to all backfilling, grassing and sodding, and routine site restoration. Item not covered in the Bid Schedule shall be included in the cost for other items.

PART 2 PRODUCTS

2.1 MATERIALS

A. Discharge and Suction Pipes: Approved by Engineer.
   1. Discharge piping: Determined according to flow calculations and system operating calculations.
   2. Suction piping: Determined according to pump size, flow calculations, and manhole depth following manufacturer's specifications and recommendations.

B. Polyethylene Plastic Pipe:
   1. High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D1248 and ASTM D3550

C. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults. High-Density Polyethylene (HDPE).
   1. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.
      a. Defective areas of pipe: Cut out and joint fused as stated herein.
   2. Assembled and joined at site using couplings, flanges or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657.
      a. Threaded or solvent joints and connections are not permitted.
   3. Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.
   4. Butt-fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.
      a. Allow adequate cooling time before removal of pressure.
      b. Watertight and have tensile strength equal to that of pipe.
      c. Acceptance by Engineer before insertion.

   5. Use in streams, storm water culverts and environmentally sensitive areas.

D. Flexible Hoses and Associated Couplings and Connectors.
   1. Abrasion resistant.
   2. Suitable for intended service.
   3. Rated for external and internal loads anticipated, including test pressure.
      a. External loading design: Incorporate anticipated traffic loadings, including traffic impact loading.
   4. When subject to traffic loading, compose system, such as traffic ramps or covers.
      a. Install system and maintain H-20 loading requirements while in use or as directed by the Engineer.

E. Valves and Fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.

F. Plugs: Selected and installed according to size of line to be plugged, pipe and manhole configurations, and based on specific site.
   1. Additional plugs: Available in the event a plug fails. Plugs will be inspected before use for defects which may lead to failure.

G. Aluminum "irrigation type" piping or glued PVC piping will not be permitted.

H. Discharge hose will only be allowed in short sections when approved by Engineer.

2.2 EQUIPMENT

A. Pumps.

1. Fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system. The pumps may be electric or diesel powered with a fuel storage capacity for 24 hours of continuous operations. The Contractor shall provide all of the required diesel fuel and power for the system.
2. Open channels or trenches shall not be used to convey flow.
3. Pumping equipment must have the capacity to convey one hundred (100) percent of peak flows around the construction area. The flow shall be intercepted at the upstream end of the construction area and shall be pumped through temporary piping of adequate size. The flow shall be discharged into a manhole on the downstream side of the construction area, thus bypassing the sewer segment(s) under construction
4. The maximum allowable bypass pumping system wet well level during the bypass pumping operation will be a minimum of 3 feet and 6 inches below the lowest overflow elevation along the incoming sewer. The Contractor is responsible for providing a pumping system that can meet any required suction heads or provide a submersible pump to feed the suction of the primary pumping system.
5. The pump discharge piping shall be suitably sized for the flow to be pumped and shall discharge into an approved downstream manhole or wet well. The discharge pipe in the manhole or wet well shall be suitably braced and directed so that damage to existing facilities and equipment is prevented. If multiple pumps are required to meet the required pumping capacities, the Contractor shall provide the necessary fittings and connections for connecting multiple pump discharges to a single discharge pipe.
6. The pumping system shall be equipped with the necessary float switches or level monitoring devices required for starting and stopping the pump. Float switches shall also be provided to sound an alarm if the water level in the bypass pumping system wet well reaches a critical depth.
7. All pumps used must be constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.
8. The Contractor shall provide the necessary control power for the bypass pumping system
9. Bypass pumps shall be sound attenuated with a maximum noise level of 72 dBA at nine (9) meters or (27.5').

B. Provide.

1. Necessary stop/start controls for each pump.
2. One standby pump of each size maintained on site. Back-up pumps shall be one-line, isolated from primary system by a valve.
3. Quiet flow pumps at request of Engineer.
4. Discharge piping – to prevent the accidental spillage of flows, all discharge systems shall be temporary constructed of rigid pipe with positive, restrained joints.

2.3 DESIGN REQUIREMENTS

A. Bypass pumping systems:

1. Existing pump serves three gravity lines as follows:

SERVICE SUMMARY TABLE		
Location	**Number of Seats**	**Square foot of Building (SF)**
Flow at exist 4" gravity main	Little Store Restaurant (50)	Gilbert Center (4700 SF) Andrew Logan Psychotherapy (1200 SF) 2991 Woodside Office (1950 SF) 2989 Woodside Office (1400 SF) 2984 Woodside Office (1700 SF) 2977 Woodside Office (3000 SF) 2973 Woodside Office (900 SF) 2967 Woodside Office (5500 SF) 2989 Woodside Office (3500 SF) 2955 Independent Hall (7000 SF)
Flow at exist SSMH Sta. 1+32.29	Woodside Village Church (400) Woodside Parent Nursery School (40) Woodside Elementary School (360)	Woodside Library (5600 SF) Woodside Fire Protection (5400 SF) Robert Super Market (11000 SF) 49 Residential Properties
Flow at exist SSMH Sta. 1+59.42		Commercial Building (17500 SF) 58 Residential Properties

2. Contractor shall submit to Town bypass pump system design prepared by a registered civil engineer. The design flow for the bypass pump shall match the anticipated flow at which time Contractor plans to perform the work.

3. Bypass pump system shall be operable for the period which Contractor plans to shut-down.

B. The Contractor shall provide all pipeline plugs and pumps of adequate size to handle peak flow, and temporary discharge piping to ensure total flow of main can be safely diverted around work zone.

C. The Contractor must have full redundancy equipment available and ready for immediate operation and use in the event of an emergency or breakdown. Primary and back-up bypass pumping systems shall have sufficient capacity to pump the peak flow. One standby pump for each pump size utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.

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PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL AND MAINTENANCE

A. Test:
The Contractor shall perform leakage and pressure tests of the bypass pumping discharge pipe using clean water prior to actual operation. The Contractor shall get the water meter from Cal Water to get clean water for leakage test. The pressure and leakage test shall be conducted at 1 ½ times the maximum pressure the system will experience based on the approved Bypass Pumping Plan for a period of two hours. No leakage is permitted during this test. The Engineer will be given 24 hours' notice prior to testing. In addition, the Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning the Work.

B. Inspection:
The Contractor shall inspect bypass pumping system every two hours to ensure that the system is working properly. The contractor shall provide and keep on-site manual and a log book of all bypass pumping operations 24 hours per day, 7 days per week if the bypass pumping system is to be utilized.

C. Maintenance Service:
The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

D. Extra Materials:
1. Spare parts for pumps and piping shall be kept on-site as required.
2. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

E. The release of raw wastewater onto the ground or into a receiving stream is prohibited. In the event that such spillage or overflows do occur during the course of or as a result of the Work, the Contractor performing the Work shall immediately eliminate the spillage or overflow and, as necessary, remove the blockage and eliminate the back-up. On elimination of the spillage or overflow, the Contractor is to clean up and disinfect the area. Work to stop or contain such events is to be deemed emergency in nature and sufficient justification for total mobilization of resources, the use of overtime or double time, and any other reasonable measures to assure correction of the problem without delay. Damages arising from blockages, back-ups, spillage, or overflows of sewage during the course of the Work or because of the Work shall be the sole responsibility of the Contractor. The Contractor is responsible for paying all costs of cleanup and all fines imposed for overflows or spills during construction.

3.1 INSTALLATION AND REMOVAL

A. Provisions and requirements must be reviewed by Engineer before starting construction.

B. Remove manhole sections or make connections to existing sewer and construct temporary bypass pumping structures at access location indicated on Drawings and as required to provide adequate suction conduit.

C. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

D. When working inside manhole or force main, exercise caution. Follow OSHA, Local, State and Federal requirements. Take required measures to protect workforce against sewer gases and/or combustible or oxygen-deficient atmosphere, and confined spaces. Installation of Bypass Pipelines:
1. Pipeline may be placed along shoulder of roads.
   a. Do not place in streets or sidewalks.
2. When bypass pipeline crosses local streets and private driveways, place in roadway ramps.
   a. When roadway ramps cannot be used, place bypass in trenches

and cover with temporary pavement as approved by Engineer.

E. During bypass pumping operation, protect sewer lines from damage inflicted by equipment.

F. Upon completion of bypass pumping operations, and after the receipt of written permission from Engineer, remove piping, restore property to pre-construction condition and restore pavement.

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PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Item of work required for a temporary bypass pump system will not be measured separately for payment and shall be considered to be included in the various contract items of work required for diversion of the sanitary sewer.

END OF SECTION 00 1300

SECTION 00 1400 – MOBILIZATION AND SITE PREPARATION

PART 1 GENERAL

1.1 THE REQUIREMENT

A. The Work of this Section includes all those measures required during the CONTRACTOR's initial move onto the site to protect existing fences, structures, and associated improvements, streets, and utilities adjacent to the construction areas from damage due to boulders, trees or other objects dislodged during the construction process, including installation of a temporary fence around the work zone.

B. Contractor is to coordinate with the Town and Project CM to establishes the requirement for conducting a Pre-Construction and Post-Construction Site Survey and for the Contractor's submittal of site condition survey information, including photographs, digital recordings and mapping, of Pre-Construction conditions. Contractor is to provide to the Town and Project CM Pre-Construction and Post Construction Site Surveys of the entire job, including private and public property within adjacent to the construction limits.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1, General Requirements.

B. Section 00 1600, Earthwork and Excavation

1.3 JOB CONDITIONS

A. Existing Conditions. The CONTRACTOR shall determine the actual condition of the site as it affects this portion of the Work.

B. Protection. Site preparation shall not damage existing structures or cause obstruction and/or contamination to the property. The CONTRACTOR shall repair or replace any damaged property at no cost to the TOWN.

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that material to be used comply with information specified herein.

C. The CONTRACTOR shall submit to the ENGINEER a schedule of proposed disposal locations and written authorization from disposal site owner.

D. The CONTRACTOR shall submit safety measure drawings.

E. The CONTRACTOR shall submit a map identifying the location of any construction staging areas to be utilized, unless shown on the Project Drawings. The CONTRACTOR shall submit written authorization from each site owner.

F. Deactivating Existing Facilities (PG&E gas and electric services and sewer mains). The CONTRACTOR shall submit to and obtain the ENGINEER's approval of a deactivation plan 30 days prior to commencing with the work. The CONTRACTOR shall also advise the ENGINEER in writing not less than forty-eight hours in advance of the time of any necessary deactivation of existing services and/or sewer pipelines, which are to be connected to the new work.

PART 2 PRODUCTS

2.1 SAFETY BARRIERS

A. The CONTRACTOR shall prepare a submittal to the ENGINEER with drawings that define the proposed safety measures prior to any construction activity.

B. All work shall be done in conformance with the rules and regulations pertaining to safety established by California Division of Industrial Safety and OSHA.

PART 3 EXECUTION

A. Number of access points onto the site shall be minimized and where feasible, situated in locations that are highly visible from an adjacent street.

B. Temporary Perimeter Fencing, Gates and Locks shall be installed around the work zone as shown on the plans and as specified by the Engineer.

1. Fencing shall be a minimum 6' high with green 94% minimum blackout with heavy duty fabric screening.
2. Fencing shall not be covered for 20 feet on each side of gates.
3. Padlocks used for securing gates
4. Locking gates shall be secured with minimum 3/8 inch thick, 30 grade coil chain, or minimum 5/16 inch cable.
5. "No Trespassing" signs, listing California Penal Code Section 602, installed at all perimeter access points.

Contractor shall furnish, erect and maintain such fences, and signs and provide such flagging and guards as are necessary in the opinion of the Town, to give adequate warning to the public of the construction and of any dangerous condition to be encountered as a result thereof. All devices and their use shall conform to the requirements set forth in the MUTCD and of the MUTCD California supplement. Signs or other protective devices furnished and erect by Contractor, at Contractor's

expense. Contractor is responsible to move fence around the work area to provide access and kept the area safe at no additional cost to the Town.

C. Trail and Project Information Signs

Both Trail and Project Information signs shall be furnished and erected by Contractor as shown on the plans.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Measurement

A. Temporary bypass pumping system will be measured for payment as a lump sum item

4.2 Payment

A. The contract lump sum price paid for temporary bypass pumping system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work required for diversion of the sanitary sewer including cover as specified herein and per plans, complete and in place, as shown on the plans as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 1400

SECTION 00 1500 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:
1. Drawing, Division 0 &1, including Doc. 007200 General Conditions, and the technical specifications apply to this section.
2. State of California, Department of Transportation (Caltrans), Standard Specification 2010.

a) Section 15 Existing Highway Facilities

b) Section 16 Clearing and Grubbing

B. Related Sections:

a) Section 00 1400 – Mobilization and Site Preparation.

b) Section 00 1100 - Tree Protection and Biological Monitoring.

1.2 REFERENCES

A. The General Conditions, Supplementary Conditions, and applicable portions of Division I apply to the work of this Section as if printed herein.

1.3 REGULATORY REQUIREMENTS

A. Comply with all applicable codes, standards, and regulations in the execution of the work.

1.4 PROJECT CONDITIONS

A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. .

PART 2 PRODUCTS

No products are required in this Section.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that existing heritage trees designated to remain are tagged or identified, if applicable.

B. Call Local USA Underground not less than two working days before performing Work.

C. Requested underground utilities to be located and marked within and surrounding

construction areas.

D. Remove or abandon facilities when it is no longer used or active.

E. Each structure to be filled with pea gravel, 2-sack slurry or approved equal.

F. Existing manhole frame and cover and grade ring will be removed and disposed of, upon removal, areas shall be saw cut neatly around the structure and repaved in accordance with paving section specified elsewhere in these specification.

G. Indicated locations of existing utilities are approximate; Contractor shall determine exact locations by potholing before commencing work.

3.2 PROTECTION

A. Locate, identify, and protect utilities that remain from damage.

B. Existing pump station structure shall remain in place. If Contractor determine it necessary to remove portion of the structure for the work requirement, Contractor shall restore existing structure to its' original condition.

C. Protect heritage trees designated to remain, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees to be left standing.

1. Water trees and other vegetation to remain within limits of contract work as require maintaining their health during course of construction operations.
2. Provide protection for roots over 1-1/2 inch in diameter that are cut during construction operations. Coat cut faces with emulsified asphalt or other acceptable coating formulated to use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
3. Repair or replace trees indicated to remain that are damaged by construction operations in a manner acceptable to TOWN. Employ a licensed arborist to repair damage to trees.
4. Replace trees that cannot be repaired and restored to full-growth status, as determined by arborist.

D. Protect benchmarks and existing improvements on adjoining properties and existing improvements on the TOWN's property designated to remain, from damage or displacement.

E. Restore damaged improvements to their original condition, as acceptable to the TOWN at no extra cost to owner.

3.3 CLEARING, GRUBBING, AND STRIPPING

Where existing utilities interfere with the Work, the Work shall be stopped and the ENGINEER shall be notified of interferences before proceeding in accordance with the Contract Documents.

All construction areas shall be cleared of structures, concrete, masonry, or pavement debris, landscaping, trees, logs, upturned stumps, grass, weeds, loose boulders, and any other objectionable material of any kind which would interfere with the performance or completion of the Work, create a hazard to safety, or impair the Work's subsequent usefulness or obstruct its operation. Loose boulders within 10 feet of the top of cut lines shall be incorporated in landscaping or removed from the site. Trees and other natural vegetation outside the actual lines of construction shall be protected from damage during construction and trees within site not shown to be demolished.

Within the limits of clearing, the areas below the natural ground surface shall be grubbed to a depth necessary to remove all stumps, roots, buried logs, and all other objectionable material. Cleanouts and connection lines and any other underground structures, debris or waste shall be totally removed if they are found on the site. All objectionable material from the clearing and grubbing process shall be removed from the site and wasted.

Additional requirements for excavating or removing existing soil are shown on the Drawings. Unless otherwise shown or specified, native trees larger than 3 inches in diameter at the base shall not be removed without the ENGINEER's approval. The removal of any trees, shrubs, fences, or other improvements outside of the limits of construction as deemed necessary by the CONTRACTOR, shall be arranged with the TOWN, removed and replaced, if required, by the CONTRACTOR at his/her expense.

Trees and shrubbery adjacent to the trench, pole lines, fences, signs, survey markers and monuments, structures, conduits, pipeline under or above ground, all roadway facilities and any other improvements or facilities within or adjacent to the work shall be protected from injury or damage, and, if ordered by the ENGINEER, the CONTRACTOR shall provide and install suitable safeguards approved by the ENGINEER to protect such objects from injury or damage.

Serious injuries to trees to remain shall be avoided. No major roots or branches crossing the trench shall be cut if such cutting would seriously injure or imperil the safety of the tree or trench. All limbs, roots or branches, which are cut or broken, shall be trimmed and painted with an approved tree seal. If other objects are injured or damaged by reason of the CONTRACTOR’s operations, they shall be replaced or restored, at the CONTRACTOR’s expense, to a condition at the time the CONTRACTOR entered upon the work.

The ENGINEER shall be notified when site preparation work is completed.

3.4 REGRADING

In areas to receive fill, the stripped surface should be scarified to a depth of about 6 inches below the excavated level, conditioned to near optimum moisture content and re-compacted to 90 percent (90%) of maximum relative density.

Any holes remaining after stripping and grubbing shall be backfilled unless they are located within an area designated for further excavation. Backfill material and placement shall be in accordance with these specification.

3.5 DISPOSAL OF DEBRIS

Dispose of removed materials, waste, trash, and debris in a safe, acceptable manner, in

accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction.

Burying of trash and debris on the site will not be permitted. Burning of trash and debris at the site will not be permitted.

Remove trash and debris from the site daily so that its presence will not delay the progress of the Work.

Removed materials, trash, and debris shall become the property of the CONTRACTOR and shall be removed from the TOWN's property and disposed of in a legal manner. Location of disposal site and length of haul shall be the CONTRACTOR's responsibility.

3.6 TOPSOIL EXCAVATION

Topsoil is defined as friable clay loam surface soil found in a depth of not less than three (3) inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over two (2) inches in diameter, and without weeds, roots, and other objectionable material.

3.7 REMOVAL AND ABANDON

A. Existing AC dike, pipes, pumps, and service/control panels shall be removed as shown on the plans.

B. Existing manhole will be abandoned in place. The concrete bottoms will be broken up via jack hammer or other mechanical means into pieces no larger than one foot (1') in any dimension and left in place. Alternatively, three 3-in diameter drain holes can be core drilled all the way through the bottoms of each structure.

C. Each structure to be filled with pea gravel, 2-sack slurry or approved equal.

D. Existing manhole frames, hatches, covers and grade rings will be removed and disposed. Upon removal of these items, area to be saw cut and repaved according to the Town of Woodside and West Bay Sanitary District roadway paving standards.

E. Asphalt Concrete (Type A) for pavement restoration will be installed per construction details on the plans.

F. All sewer lines and force mains to be abandoned will be filled with 1-sack Portland Cement Concrete slurry and plugged at the upstream and downstream pipe ends. No additional payment shall be made for this item

G. Before abandoning sewer mains, cap ends of 6" VCP.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Item of work required for site clearing will not be measured separately for payment and shall be considered to be included in the payment for Mobilization and Site Preparation (Section 00 1400).

END OF SECTION 00 1500

SECTION 00 1600 - EARTHWORK AND EXCAVATION

PART 1 GENERAL

1.1 THE REQUIREMENT

A. This Section includes all earthwork required for construction of the Work. Such earthwork shall include, but not be limited to the loosening, removing, loading, transporting, depositing, and compacting in its final location of all materials wet and dry, as required for the purposes of completing the Work specified in the Contract Documents. The Work shall also include, but not be limited to, furnishing, phasing, and removing of shoring, dewatering as specified elsewhere in this specification, supporting of structures and utilities above and below the ground; all backfilling around structures and utilities and all backfilling of trenches and pits; the disposal of excess excavated materials; borrowing materials for fills; and all other incidental earthwork; all in accordance with the requirements of the Contract Documents.

B. The CONTRACTOR shall provide all materials, equipment, and labor necessary to perform and complete all earthwork as shown on the Drawings and as specified herein.

C. Excavations and backfill for appurtenant structures such as, but not limited to, maintenance holes shall be deemed to be in the category of excavation and backfill.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 1400, Mobilization and Site Preparation

C. Section 00 2000, Asphalt Paving

B. Section 00 2400, Concrete, Grout, and Precast Structures

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. Specifications, Codes and Regulations:
1. California Department of Transportation Test Method Nos. 301 and 217.
2. Caltrans Standard Specifications, 2010 Edition
3. U.S. Corp of Engineers, Specification CW-002215
4. State of California, Department of Environmental Protection Regulations

C. This Section contains references to the following documents. In case of a conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail. The latest edition of the following references at the time of bid shall be used:

ASTM C150	Specification for Portland Cement
ASTM C231	Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Specification for Air-Entraining Admixtures for Concrete
ASTM C618	Specification of Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete
ASTM D422	Method for Particle-Size Analysis of Soils
ASTM D1556	Test Method for Density of Soil in Place by the Sand-Cone Method
ASTM D1557	Test methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
ASTM D2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2487	Classification of Soils for Engineering Purposes
ASTM D2844	Resistance R-Value and Expansion Pressure of Compacted Soils
ASTM D2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3744	Aggregate Durability Index
ASTM D3776	Test Methods for Mass per Unit Area (Weight) of Woven Fabric
ASTM D3786	Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method
ASTM D4253	Test Methods for Maximum Index Density of Soils Using a Vibratory Table
ASTM D4254	Test Methods for Minimum Index Density of Soils and Calculation of Relative Density
ASTM D4355	Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D4491	Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4632	Test Method for Grab Breaking Load and Elongation of Geotextiles

ASTM D4751	Test Method for Determining the Apparent Opening Size of a Geotextile
ASTM D4833	Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
Caltrans Standard	Aggregate Subbases Specification, Section 25
Caltrans Standard	Aggregate Bases Specification, Section 26

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that material to be used comply with information specified herein.

C. Certificates of Compliance. Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

D. Submit a work plan detailing the order of work, shoring, waste excavation minimization and material handling.

1.5 QUALITY ASSURANCE

A. General. It shall be the responsibility of the CONTRACTOR to accomplish the specified compaction for backfill or other earthwork. All soils testing will be done by a testing laboratory of the TOWN's choice at the TOWN's expense except as otherwise specified below. The CONTRACTOR shall provide the ENGINEER at least 24 hours' notice in advance of required tests.

B. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content shall be determined in accordance with ASTM D1557. Where cohesion-less, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density shall be determined in accordance with ASTM D4253 and ASTM

D4254. Field density in-place tests shall be performed in accordance with ASTM D1556, ASTM D2922, or by such other means acceptable to the ENGINEER.

C. In case the first test and one retest of the fill or backfill show non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance. Subsequent testing after the first retest to show compliance shall be by a testing laboratory selected by the TOWN and shall be at the CONTRACTOR's expense.

D. The CONTRACTOR shall notify the ENGINEER at least 48 hours prior to performing any excavation.

E. Perform work as specified herein and in accordance with Section 19, “Earthwork” of the State of California Department of Transportation, Standard Specification dated 2010.

F. Particle size analysis of soils and aggregates shall be performed using ASTM D422.

G. If at any time, the Contractor encounters evidence of contaminated soil or groundwater, as indicated by visual discoloration, noticeable odor, or evidence of asbestos fibers, the Contractor shall immediately notify the Town.

H. If at any time, the Contractor encounters any potential historical artifacts, including glass, ceramics, wooden structures or skeletal remains; the Contractor shall stop work and immediately notify the Town.

I. The Contractor is responsible for performing excavation to meet applicable CALOHSA safety standards and requirements.

J. The Contractor is responsible for determining the equipment and construction methods necessary to efficiently perform the works.

K. Determination of sand equivalent value shall be performed using ASTM D2419 or California Test Method No. 217, State of California, Department of Transportation.

L. The determination of durability index shall be made using ASTM D3744.

M. The determination of the resistance (R-Value) shall be made using ASTM D2844 or California Test Method No. 301, State of California, Department of Transportation.

N. All materials to be used shall be natural materials. No recycled materials are acceptable.

O. The CONTRACTOR shall provide access in the trench for the soil compaction testing technician or inspector. This shall include providing and properly installing safety equipment and temporary shoring to enable compaction testing at SEVERAL LEVELS in the trench. Should the CONTRACTOR have backfilled to an elevation above that required to be tested, then the backfill shall be excavated down to the necessary level for testing and provided at the CONTRACTOR’s cost. Subsequent backfilling shall also be at the CONTRACTOR’s cost.

P. Unified Soil Classification System. References in these specifications to soil

classification types and standards are set forth in ASTM D2487. The CONTRACTOR shall be bound by all applicable provisions of said ASTM D2487 in the interpretation of soil classifications.

Q. The Contractor is responsible for performing excavation to meet applicable OSHA safety standards and requirements.

R. The Contractor is responsible for determining the equipment and construction methods necessary to efficiently perform the work.

1.6 EXISTING SITE CONDITIONS

A. Location of existing pipelines, utility and substructures shown on the Contract Drawings are approximate. It shall be the Contractor's responsibility to contact all Owners of lines and structures that may interfere with the work. Contact Underground Service Alert (1-800-642-2444) at least 2 working days before commencing work.

Cooperate with the Owner and utility agencies to keep services and facilities in operation. Repair damaged substructure to the satisfaction of the Owner at no additional cost to Owner. Do not interrupt existing utilities serving facilities occupied and used by others, except when permitted in writing by the Owner or private utility owner(s) and then only after acceptable temporary utility services have been provided.

B. Above ground utilities adjacent to excavations shall be protected by the Contractor using methods approved by the Owner of the facility.

1.7 DEFINITIONS

A. Common Excavation: Removal of materials, regardless of the nature of the material encountered, the moisture content thereof, and the type of equipment required for excavating to the top of subgrade as shown on the plans. Common Excavation will include the removal of pavement bases, granular material, soil, rubble, saturated or unsaturated mixtures of unsatisfactory soils and organics (peat, muck, etc.) and any other material encountered within the limits of new construction.

i. Utility Trench Excavation: Removal of material, regardless of the nature of the material encountered, the moisture content thereof, and the type of equipment required for excavating utility trenches as shown on the plans. Utility trench excavation will include the removal of pavement bases, granular material, soil, rubble, saturated or unsaturated mixtures of unsatisfactory soils and organics (peat, muck, etc.) and any other material encountered within the limits of new construction.

ii. Degree of Compaction: A percentage of the maximum density obtained by the test procedure presented in ASTM D1557, Method C.

1.8 SURVEY CONTROL

A. CONTRACTOR shall verify that intended elevations for work are as shown on the Drawings.

PART 2 -- PRODUCTS

2.1 SUITABLE MATERIALS

A. Class 2 Aggregate Base.

1. Aggregate base shall conform to gradation requirements specified in Caltrans' Standard Specifications, Latest Edition, Section 26-1.02 A, "Class 2 Aggregate base" .
2. Recycled materials are not acceptable.
3. Aggregate base shall be free from vegetable matter, reclaimed asphalt, concrete, glass and other deleterious substances. Coarse aggregate, material contained on the No. 4 sieve, shall consist of material of which 25 percent by weight shall be crushed particles.
4. ¾" Class 2 aggregate base material shall conform to the following grading, determined in accordance with ASTM C136:

Percent Passing Sieves

Sieve Sizes	1-1/2 inch Maximum	¾ inch Maximum
2-inch	100	--------
1-1/2 inch	90-100	--------
1-inch	-------	100
¾-inch	50-85	90-100
No. 4	25-45	35-55
No. 30	10-25	10-30
No. 200	2-9	3-9

Test	ASTM Method No.	Requirements
Resistance (R-value)	D28744	78 min.
Sand Equivalent	D2419	30 min.
Durability Index	D3744	35 min.

B. Native Material (only allowed for certain applications approved by the Town)

1. Native material shall be material obtained from on-site excavations, provided the materials are not classified as unsuitable. Native material shall be free of stones, lumps, broken concrete or bituminous surfacing over 4 inches in diameter, objectionable material, vegetation, and deleterious substances.

C. Type 1 Material – ¾" Crushed Rock.

1. Type 1 material shall be clean, durable, natural 3/4-inch crushed (angular) drain rock.

D. Sand.

1. Sand shall be free of organics and other deleterious materials.
2. Sand shall meet the following gradation requirements:

Sieve Size	Percent Passing
3/8-inch	100
No. 4	90-100

3. Sand shall have a sand equivalent not less than 30.

2.2 UNSUITABLE MATERIAL

A. Unsuitable soils for fill material shall include, but not be limited to, all soils that, when

classified under ASTM D2487, fall in the classifications of PT, OH, or OL. Type CH and MH soils will be permitted in unimproved areas only where required compaction and stability can be demonstrated.

B. In addition, any soil that cannot be compacted sufficiently to achieve the percentage of maximum density specified for the intended use, shall be classed as unsuitable material.

C. Materials Containing Detrimental Amounts of Organic Matter. Organic matter shall be no more than 5 percent. Amount of organic matter shall be determined based on ASTM Test Method D2974.

D. Materials containing rock or similar irreducible material with a maximum dimension greater than 6 inches.

E. Materials containing foreign manmade objects, such as construction debris.

F. Materials of such unstable nature as to be incapable of being compacted to specified density using ordinary methods at optimum moisture content.

G. Materials that are too wet to be properly compacted and circumstances that prevent suitable in-place drying prior to incorporation into the Work. However, the presence of excessive moisture in a material is not, by itself, sufficient cause for determining that the material is unsuitable.

H. Any material determined to be hazardous is defined as unsuitable material. If the materials which believes to be a hazardous substance as defined in Section 25914.1 of the Health and Safety Code; Contractor shall immediately cease work in the affected area and report the condition to the Town in writing. Contractor shall be handled in accordance with applicable local, state, and federal regulations which may include: (1) CCR Title 8, Division 4, Chapter 4, Section 5192 (Hazardous Waste Operations and Emergency Response); (2) CCR, Title 22, Division 4.5, Chapters 10 through 13 and 18 (Environmental Health Standards for Management of Hazardous Waste); and (3) CCR Title 23, Division 3, Chapter 15 (Discharges of Waste to Land). Contractor transport, deliver, handle, and store materials and equipment at the Site in such a manner as to prevent the breakage, damage or intrusions of foreign matter or moisture, and otherwise to prevent damage.

I. Washed, smooth rock (pea gravel) is classified as unsuitable material.

J. Materials that is unsuitable for the planned use.

K. When moisture content of the material is not in conformance with this Specification, the material shall be classified as unsuitable material.

L. Chemical testing for corrosively shall be performed for all materials proposed for use as backfill for metallic pipe. The testing shall be in accordance with the requirements of California Test Methods 532 and 643 of the California Department of Transportation. Backfill materials shall be considered unsuitable when the chloride concentration exceeds 500 ppm, sulfate concentration exceeds 1,500 ppm, resistivity is less than 2,000 ohm-cm or pH is less than 6.5. Testing shall be performed by a qualified laboratory as approved by the ENGINEER. The test results

shall be submitted to the ENGINEER for acceptance during the submittal process.

2.3 USE OF FILL AND BACKFILL MATERIAL TYPES

A. The CONTRACTOR shall use the types of materials as designated herein, and as shown on the Contract Documents for all required construction.

B. Fill and backfill types shall be used in accordance with the following provisions:
   1. Pipe bedding, pipe zone, trench zone, and final zone shall be as shown on the Contract Drawings, unless otherwise specified.
   2. Aggregate base materials under pavements, sidewalks, and curb and gutters shall be aggregate base material constructed to the thicknesses shown or specified.
   3. Backfill materials beneath concrete slabs on grade shall be ¾" crushed rock, as shown on the PLANS.
   4. Trench backfill and final zone backfill for pipelines under slabs shall be the same material as used in the pipe zone, except where specifically required otherwise by the Contract Documents.

PART 3 -- EXECUTION

3.1 GENERAL

A. All excavations shall be in accordance with Caltrans Standard Specifications, 2010 Edition and in compliance with Cal OHSA requirements and guidelines.

B. Existing Underground Lines and Services: Carefully uncover, support and protect lines and services. Care should be exercised in protecting lines against damage. Do not cut, remove or damage these items without prior written approval from the Utility; otherwise the Contractor shall repair or replace the items at the Contractor's expense, to the satisfaction of the Utility. Remove unclaimed utilities as directed.

C. Vertical Tolerance. Vertically layout and finish-grade the earthwork area to within 0.30 feet of the elevation(s) shown on the Drawings, and to smoothly transition vertically with the existing ground lines existing ground lines.

D. Horizontal Tolerance. Horizontal layout and construct the earth to within 0.5 feet of the true horizontal position indicated on the drawings, and smoothly transition horizontally with the existing ground lines. The principal edges of earthwork shall be constructed straight or smoothly curved as indicated on the drawings without readily noticeable waviness.

E. Grading Tolerance. Construct slopes within 5 percent of the designed slope ratio. Slopes shall be even, i.e., not convex nor concave when viewed up-and-down and across the face of the slope.

F. Excavation shall include removal of all waters that interfere with the construction work.

G. Excavated spoils shall be dumped directly into trucks for off haul, as native excavated soil cannot be used as backfill. Dumping of excavated materials on adjacent pavement will not be permitted.

3.2 DUST CONTROL

A. Dust control shall be in accordance with the Caltrans Standard Specifications Section 18. The Contractor shall keep the entire site of work, inclusive of pedestrian and vehicular routes through the work areas, continuously free of dust, by watering as follows:

1. Supply water and apply at locations necessary to control dust from excavated areas, from stacked materials, and from other materials in the amount as directed by the Town,.
2. The Contractor's dust control activities shall be in accordance with the applicable OSHA, CAL/OSHA, and State of California, Department of Environmental Protection regulations.
3. Use of soil binders shall be subjects to conformance with all project requirements and prior acceptance by the Town.

3.3 EXCAVATION

A. General. The CONTRACTOR shall submit an excavation plan for review before any excavation commences. Excavations in areas of pedestrian or vehicular traffic shall be open the minimum time necessary to complete the Work, but shall not exceed 4 days maximum before backfilling trench. Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the Work. The removal of said materials shall conform to the lines and grades shown or ordered. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

B. Steel Plates requirement outside of the fenced work zone. Steel plates of 1-inch minimum thickness with adequate trench bracing shall be used to bridge across trenches at roadways where trench backfill and temporary patch have not been completed during regular working hours. Safe and convenient passage for pedestrians shall be provided. The ENGINEER may designate a passage to be provided at any point deemed necessary. Access to fire stations, fire hydrant, and hospitals shall be maintained at all times. Steel plates shall only be allowed where specified herein.

C. Excavation beneath Paved Areas. Excavation under areas to be paved shall extend to the bottom of the aggregate base. After the required excavation has been completed, the exposed surface shall be scarified, brought to optimum moisture content and compacted.

3.3 PIPELINE AND UTILITY TRENCH EXCAVATION

A. General. Unless otherwise shown, ordered, or accepted by the ENGINEER, excavation for pipelines and utilities shall be vertical trenches, unless otherwise shown.

B. Existing utilities, maintenance holes, drainage structures, and other facilities shall be protected, supported, and kept in service.

C. Excavation and pipe laying shall proceed up station or upstream unless otherwise approved by the ENGINEER.

D. Trench Bottom. The bottom of the trench shall be excavated uniformly. The trench bottom shall be given a final trim, using a laser to set the string line for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe. Rounding out the trench to form a cradle for the pipe will not be required. Bell holes shall be excavated in the pipe bedding material as required to ensure uniform bearing of the pipe barrel on the bottom of the trench. Trench bottom shall be prepared as shown on the trench detail.

E. Open Trench. The maximum lengths of open trench permitted in any on location shall be the length necessary to accommodate the amount of pipe installed in a single day. The distance is the collective length at any location, including open excavation, pipe laying and appurtenance construction, and backfill that has not been temporarily resurfaced. All trench excavations shall be fully backfilled at the end of each day. Use of steel plates as open trench covers will not be permitted except as described below:

1. Trench plates will be allowed to cover a minimum area over the end of the last section of pipe installed each day, provided the trench is properly shored and the plates are within barricaded area approved by the ENGINEER. Temporary backfill of the trench in the plated area is not required. Trench plates will not be allowed in intersections and open traffic lanes.
2. In other special circumstances, but only with the prior approval of the ENGINEER and the TOWN.
3. When traffic plates are authorized, they shall be provided with non-skid coating and cold mix asphalt around the plate perimeter

F. Trench Over-Excavation. Where the Contract Documents indicate that trenches shall be over-excavated, they shall be excavated to the depth shown, and then backfilled to the grade of the bottom of the bedding.

G. Over-Excavation. If the bottom of the excavation is found to consist of soft or unstable material that is incapable of properly supporting the pipe or structure, the ENGINEER shall be advised immediately. At the ENGINEER's direction, such material shall be removed to the depth and for the lengths ordered. The trench shall then be backfilled to the grade of the bottom of the bedding with coarse bedding material wrapped in geotextile fabric as specified herein. When over-excavation is ordered by the ENGINEER, additional compensation will be provided to the CONTRACTOR.

1. The CONTRACTOR shall obtain the ENGINEER's written approval prior to over-excavating. Any over-excavating and resultant backfill and compaction without such approval shall be at the CONTRACTOR's expense. The quantity of approved unsuitable material excavated and its replacement shall be paid for as directed by the ENGINEER.

H. Shoring. The work specified in this section includes shoring systems for the support of excavations including, but not limited to, trench or structure excavations in depth of 5 feet or greater. The CONTRACTOR shall furnish, install, and remove upon completion of the required construction, unless shown otherwise, all systems of

supports, including all bracing and associated items to retain the sides of the excavations. The CONTRACTOR shall be responsible for the selection of methods, the design, construction and removal of all shoring systems. Shoring shall be required.

Design of ground support system and methods should be the sole responsibility of the CONTRACTOR. The CONTRACTOR'S ground support plan must take into consideration the challenging subsurface conditions at the site which include variable fill deposits, loose, water-bearing alluvial deposits, existing structures, and pipelines which have been abandoned. The CONTRACTOR should independently evaluate ground support system and make his own selection of appropriate ground support techniques which meet the project requirements. The ground support and dewatering systems are interdependent and, as such, the ground support and dewatering systems shall be submitted by the CONTRACTOR at the same time for review. The CONTRACTOR's ground support system must include a contingency plan to account for the adverse impacts of existing fill, water-bearing alluvial deposits, and structure remnants, where encountered.

The provisions specified hereunder shall be understood:

1. To complement, and not to substitute or diminish, the obligations of the CONTRACTOR for the furnishing of a safe place of work pursuant to the provisions of the Occupational Safety and Health Act of 1970 and its subsequent amendments and regulations, and for the protection of the Work, structures, and other improvements.
2. To represent a minimum requirement

a. for the number and types of means needed to maintain soil stability,
b. for the strength of such required means, and
c. for the methods and frequency of maintenance and observation of the means used for maintaining soil stability.

Excavation support shall include sheeting, shoring, bracing, and other means and procedures required to maintain the stability of soils.

3.4 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. The CONTRACTOR shall remove and dispose of all excess excavated material in a legal manner at a site located off-site as selected by the CONTRACTOR and reviewed by the ENGINEER.

3.5 BACKFILL-GENERAL

A. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any structure until the concrete has attained sufficient strength to withstand the loads imposed. Backfill around water-retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.

C. Except for materials being placed in over-excavated areas, backfill shall be placed after all water is removed from the excavation.

D. Place backfill in layers not to exceed 8 inches of loose material, and compact each layer to at least 95 percent laboratory maximum density, in such a manner as to

prevent wedging action or eccentric loading.

E. Backfill excavations when installations have been completed, inspected, and approved. Concrete shall have attained sufficient strength to withstand pressure of earth and compacting operation. Before proceeding, excavations shall be free of forms, debris and other foreign materials.

3.6 PLACING AND SPREADING OF BACKFILL MATERIALS

A. Backfill materials shall be placed and spread evenly in layers, loose depth 8 inches or less.

B. During spreading, each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Pipe zone backfill materials shall be manually spread around the pipe so that when compacted, the pipe zone backfill will provide uniform bearing and side support. All materials placed below 3 feet above the top of the pipe should be compacted with hand-compaction equipment. Materials placed above 3 feet above the top of the pipe shall be compacted using heavier, self-propelled compaction equipment.

C. Where the backfill material moisture content is too low to permit the specified degree of compaction, water shall be added before or during spreading until the proper moisture content is achieved. Jetting will not be permitted for compaction.

D. Where the backfill material moisture content is too high to permit the specified degree of compaction, the material shall be dried until the moisture content is satisfactory.

E. Storage of backfill materials overnight at the job site is prohibited, unless accepted by the TOWN.

F. Bell or coupling holes shall be provided. Do not shovel slice bedding material into the bell or coupling hole.

G. Before the pipe or conduit is laid, the bedding material shall be placed and compacted in conformance to the provisions in Section 19-3.02E, “Culvert Bedding,” of the Caltrans Standard Specification, Town of Woodside requirements and per West Bay Valley Standard Details. No jetting shall be permitted.

3.7 COMPACTION OF FILL, BACKFILL, AND EMBANKMENT MATERIALS

A. Each layer of backfill materials as defined herein, where the material is graded such that at least 10 percent passes a No. 4 sieve, shall be mechanically compacted to the specified percentage of maximum density. Equipment that is consistently capable of achieving the required degree of compaction shall be used and each layer shall be compacted over its entire area while the material is at the required moisture content. Lightweight tampers or vibrating plate compactors shall be used in pipeline and utility trenches to prevent damage to existing or new utilities.

B. Compaction of backfill adjacent to all subgrade structure walls shall follow a pattern of compaction that begins at the wall face and progresses outward to the outside edge of the excavation before beginning a new lift.

C. Flooding, ponding, or jetting shall not be used.

D. Class 2 Aggregate Base materials shall be compacted by means of at least 2 passes from a flat plate vibratory compactor. ¾" Crushed rock bedding shall be placed in lifts no greater than six (6) inches at a time.

E. Compaction Requirements. The following compaction test requirements shall be in accordance with ASTM D1557, or in accordance with ASTM D4253 and D4254, as applicable.

Location or Use of Fill	Minimum Percentage of Maximum Density
Aggregate base for AC pavement	95
Backfill beneath all structures, footings, slabs and pads	95
Backfill around all structures, footings, and slabs	90
Pipe zone backfill	90
Trench zone backfill in paved and unpaved areas	90
¾" crushed rock bedding material	n/a
Pipe bedding (excluding ¾" C.R.)	90
Over-excavated zones	90
Final zone backfill, beneath paved areas	95
Final zone backfill, beneath unpaved areas	90

F. Trench Backfill Requirements. The pipe has been structurally designed based upon the trench configuration. Where pipe embedment is disturbed after compaction, such as by the removal of sheeting and shoring, the Town may require re-compaction to the specified minimum limit.

G. If the allowable deflection specified for the pipe is exceeded, the CONTRACTOR shall expose and re-round or replace the pipe, repair all damaged lining and coating, and reinstall the pipe zone material and trench backfill as specified at no additional expense to the Town.

3.8 PIPE AND UTILITY TRENCH BACKFILL

A. Pipe Backfill. The pipe zone and pipe bedding is defined as that portion of the vertical trench cross-section lying between a plane 6 inches below the bottom surface of the pipe (i.e., the trench subgrade), and a plane at a point 12 inches above the top surface of the pipe. The coarse bedding is defined as that portion of pipe zone backfill material between the trench subgrade and the bottom of the pipe.

B. After compacting the bedding, the CONTRACTOR shall perform a final trim using a stringline for establishing grade, such that each pipe section when first laid will be

continually in contact with the bedding along the extreme bottom of the pipe.

C. The pipe zone shall be backfilled with the specified backfill material as specified in the Contract Documents. The CONTRACTOR shall exercise care to prevent damage to the pipeline coating, cathodic bonds, and the pipe itself during the installation and backfill operations.

D. Trench Zone. After the pipe zone backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the trench zone may proceed. The trench zone is defined as that portion of the vertical trench cross-section lying between a plane 12 inches above the top surface of the pipe and a plane at a point 30 inches below a paved area, or 24 inches below the finished grade of an unpaved area.

E. Final zone. Final zone is all backfill in the last 30 inches between the top of the trench zone and the bottom of the paved subgrade, and the last 24 inches between the top of the trench zone and the finish final grade in unpaved area.

F. If compaction fails to meet the specified requirements, the CONTRACTOR shall remove and replace the backfill at proper compaction or shall increase the compaction to specified level by other means acceptable to the ENGINEER. Subsequent tests required to verify that the reconstructed backfill meets the specified compaction shall be paid by the CONTRACTOR.

G. Install sewer-warning tape per Section 00 2600, Piping, General.

H. Periodic compliance tests may be made by the ENGINEER at no cost to the CONTRACTOR to verify that compaction is meeting the specified requirements.

3.9 DISPOSAL OF SURPLUS MATERIAL

A. Remove excess earth materials, unsuitable materials, and debris from the site and dispose of it in a legal manner. Location of disposal site and length of the haul shall be the CONTRACTOR's responsibility.

3.10 UTILITIES

A. Location.

1. A particular effort has been made to locate and indicate on the Contract Drawings all utilities and/or other facilities, which may conflict with, cross, or lie close to the Work. While the locations shown are believed to be reasonably correct, neither the ENGINEER nor the TOWN can guarantee the accuracy of adequacy of this information.
2. The CONTRACTOR shall, before proceeding with the Work, confer with all agencies and utilities that have or may have above-ground and/or underground facilities in the vicinity of the Work. The purpose of the Conference shall be to notify said agencies and utilities of the proposed construction schedule and locate and/or verify the locations of all facilities, including connections, in the area of the Work. The CONTRACTOR shall also arrange for all necessary suspension of service and make arrangements to physically locate and avoid interference with all existing facilities. The CONTRACTOR may make arrangements for alterations or relocations for his sole convenience (not actually required to complete installation); such

alterations or relocations shall be completely at the expense of the CONTRACTOR.

3. Where existing utilities and/or other facilities, above-ground and/or underground, are encountered during construction, they shall not be displaced or molested unless necessary. If it is necessary to relocate a utility or if a utility is disturbed or accidentally damaged in the prosecution of the Work, the CONTRACTOR shall notify the TOWN and the Owner or proper authority. The CONTRACTOR shall abide with the requirements of and cooperate with such Owner or authority (who may enter upon the Work at anytime) while protecting, repairing, replacing or relocating such utilities. All abandoned pipelines that are severed during the Work shall be immediately plugged by the CONTRACTOR with approved material, unless otherwise directed by the ENGINEER.
4. A 12-inch minimum clearance shall be maintained at all utility crossings. Adjustments to the pipe alignment and elevation will be made by the ENGINEER where exploratory work indicates the need.

B. Excavation around Utilities.
1. Excavation and other work under or adjacent to utilities shall not interfere with their safe operation and use.
2. CONTRACTOR shall carefully probe to determine the exact location of utility, and hand excavate where necessary to avoid damages.
3. In the event of damage incurred during construction to such structures property, CONTRACTOR shall immediately notify the Owners or proper authorities, and shall arrange for immediate repairs at his expense.

3.11 SHORING REMOVAL

A. Shoring Removal. Shoring shall be removed as soon as the trench backfill has been placed and compacted to a level adequate to support the trench walls, unless otherwise indicated. Compaction of the backfill shall be continuous throughout the shoring removal process in order to minimize the potential creation of voids between trench walls and compacted trench backfill. Alternatively, voids created by removal of shoring may be filled by allowing low-density concrete placed on top of backfill to flow into the voids or by grouting with air-entrained concrete grout. Shoring shall be completely removed prior to compaction of the top 4 feet of trench depth.

PART 4 -- MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. The work included for earthwork and excavation will not be measured separately for payment, except for as provided in the Bid Schedule for bedding materials, Class 2 Aggregate Bases and pavement restoration as specified elsewhere in these Specifications. Full compensation for the work of this section will be considered as included in the prices for work performed under other contract items listed in the schedule of bid prices in the Bid Form, and no additional compensation will be allowed.

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END OF SECTION 00 1600

SECTION 00 1700 - DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Section includes specifications for temporary dewatering systems.

1.02 SYSTEM DESCRIPTION

A. Remove water which accumulates in excavations during the progress of work so that all work can be done in the dry, unless otherwise approved by the Engineer. Keep excavated areas free from water while underground utilities or structures are constructed, while concrete is setting and until backfill or elements of the structure have been placed to a sufficient height to anchor the work against possible leakage or buoyant uplift forces. A height to anchor the work against buoyant uplift forces shall be considered sufficient when the dead load weight of the backfill or elements of the structure exceeds the uplift forces by a minimum factor-of-safety of 1.5.

B. In addition to the other requirements specified herein, design the dewatering systems to perform as follows:

1. Prevent damage to adjacent properties, buildings, structures, utilities, and other work as a result of settlement or other groundwater-related effects.

2. At all times, maintain groundwater levels over the entire excavation a minimum of 3 feet below the excavation grade.

C. At all times, have on the work site sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable. Dispose of water in accordance with the detailed requirements specified herein and so as to cause no injury to personnel or the public, damage to public or private property, nor menace to the public health.

D. Design dewatering system to prevent pumping fines from below grade or disturbing materials exposed at the excavation bottom.

E. Furnish container for construction dewatering complete with baffles for the purpose of filtering silt prior to discharge of water. Size container or containers to suit dewatering and storage demands.

F. If the approved methods include displacing groundwater as concrete or other work is placed in excavations, the dewatering system shall capture groundwater as it is displaced and follow the procedures herein for its containment, analysis, and discharge.

G. Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering.

1.03 SUBMITTALS

A. Submit dewatering plan including shop drawings and design data including the following elements:

1. The proposed type of dewatering system.

2. Arrangement, location, and depths of system components.

3. Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.

4. Types and sizes of filters.

5. Design calculations demonstrating adequacy of the proposed system and equipment.

6. Methods of disposal of pumped water.

7. Method of water quality monitoring.

8. Type of filtration and chemical treatment of contaminated water, as applicable.

1.04 DELIVERABLES

A. Submit copies of dewatering plan as required for work of this Section, including any permits required for disposal of pumped water.

PART 2 – PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 DEWATERING

A. Except as otherwise indicated in the Contract Documents, perform dewatering to accomplish a lowering of measured static ground water level to an elevation which is suitable for the construction of structures below grade.

B. When pumping is required to reduce groundwater levels, accomplish pumping in a manner that will not disrupt the surrounding environment.

C. Do not turn off the dewatering system in a manner that the upsurge in water weakens the subgrade for completed excavation and structure foundation work.

D. Construct, operate and maintain as required to complete the Work all necessary cofferdams, channels, pipes, flumes, drains, sumps, well points and protective works; and furnish, install, operate and maintain all necessary pumping and other equipment for dewatering the areas of Work suspected of containing hazardous

materials; and control all surface flow and groundwater as may be encountered while performing the Work. Remove all water that may accumulate in the excavation while the Work progresses so that all Work can be performed in dry conditions. All contaminated water shall be removed from the excavation before it is backfilled. The excavation shall be kept free from water until backfilling has progressed to a height above the water source.

E. Storage tank: Provide a minimum 2,500-gallon double-walled water storage tank on Site for the duration of the Work. If more storage capacity is needed, provide additional storage tanks on Site.

F. Water sampling and chemical analysis: Water samples shall be collected from the holding tanks and submitted to a State-Certified chemical analysis laboratory. Chemical analyses required for the samples shall at a minimum include: TPHg following EPA Test Methods 5030/8015 (modified); benzene, toluene, ethylbenzene, and total xylenes (BTEX) following EPA Test Method 8020; and chlorinated solvents following EPA Test Method 8010.

G. Perform additional chemical analyses that may be required for disposal or recycling of the water. Laboratory chemical analysis reports associated with the water samples shall be provided to Town of Woodside.

H. Remove storage containers, including those cleaned, and other dewatering facilities from the site at the completion of dewatering operations.

I. Excavated trench, after dewatering, may be sealed water tight per State Standard Specification at the option of the Contractor in lieu of continual dewatering.

3.02 CONTAINMENT, ANALYSIS, AND DISCHARGE OF GROUNDWATER EXTRACTED

A. Containment: Upon extraction, store groundwater extracted in the process of construction dewatering in containers prior to discharge or disposal of water, as applicable. Keep containers locked to prevent accidental or purposeful discharge of the water. Contain and store the water on-site and in such a manner that it will not interfere with the Contractor's existing or continued construction operations.

B. Analysis: Collect and analyze water samples taken directly from each storage container to verify that the extracted groundwater meets applicable discharge requirements. Number of samples taken per container shall be at the sole discretion of the Engineer.

C. Discharge Requirements: Discharge no water which exceeds regulatory requirements or the jurisdictional authority's discharge requirements.

D. Discharge: Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering. Subject to the discharge restrictions specified herein and upon written authorization from the jurisdictional authority, discharge effluent from dewatering directly into existing sanitary manholes, where said sewer system is in operating condition. Provide conduits to carry said effluent to nearest sanitary sewer manhole and drainage to the nearest storm drainage. Confirm that

manholes to be utilized are in operating condition. Release water in a manner that will not impact the Contractor's operations.

E. Disposal: In the event that extracted groundwater does not meet the discharge requirements criteria, provide for the disposal of the extracted groundwater in accordance with General Provisions 7.16, Disposal of Material Outside of the Work Site. Clean dewatering containers, piping, pumps, and other dewatering facilities contaminated as a result of the Work

F. Use: Extracted groundwater of sufficient quality as shown by test data may be used on site with Engineer's written approval for those purposes approved by the Engineer.

PART 4 -- MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Item of work required for dewatering will not be measured separately for payment and shall be considered to be included in the various contract bid items for which dewatering is or may be required.

END OF SECTION 00 1700

SECTION 00 1800 - WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for water pollution control including water pollution control maintenance.

B. Water pollution control shall conform to the requirements of the Town of Woodside, the West Bay Sanitary District, the plans and these technical specifications. Water pollution control maintenance work shall be considered as integral functional practices to implement water pollution control.

C. Failure to fully comply with the requirements of the permit shall subject the Contractor to all fines, damages and job delays incurred due to failure to implement the proper measures.

1.2 REFERENCES

A. Water pollution control work shall conform to the requirements in the “Construction Site Best Management Practices (BMP’s) Manual”.

B. State of California, Department of Transportation (Caltrans):
   1. Standard Specifications:
      a. Section 13 - Water Pollution Control
      b. Section 21 - Erosion Control and Highway Planting.

1.3 SUBMITTALS

A. The Contractor shall make a combined submittal of the Water Pollution Control Program and Water Pollution Control Plan (WPC Plan), which include all the requirements specified herein.

B. The submittal shall include the site plan of the WPC Plan updated to accurately show the actual site conditions at various phases of construction and the WPC Plan revised to reflect the actual site conditions as shown on the site plan.

C. Updated and revised WPC Plan shall be submitted no later than August 1 of any 1 year and shall be updated, revised and submitted by the first day of each month thereafter until and including March 31 of the following year. From April 1 to July 31, updates, revisions and number of submittals will be determined by the Town. The updated plan shall indicate any new construction work and the addition of any new temporary erosion control or slope protection facilities added or upgraded to accommodate the new earthwork.

D. Submit working or shop drawings for any additional unit descriptions (other water pollution control measures designated by the Contractor and included in the schedule of values) to the Town for review and approval.

E. The Contractor shall update and submit a water pollution control maintenance program and schedule to the Town for approval not less than 20 working days before the beginning of each water pollution maintenance period. If the Town determines

the submitted water pollution maintenance program and/or schedule is unacceptable, the Contractor shall submit a revised maintenance program and/or schedule to the Town for approval within 5 working days after receiving notice that previously submitted program and/or schedule is unacceptable.

F. In addition to the various water pollution control measures shown on the Plans and indicated herein, any further use of these measures as proposed on the Plans and schedule of values shall be approved by the Town before installation.

G. The Contractor shall submit a list of on-hand materials and their respective quantities to the Town for review.

H. The Contractor shall submit 2 sets of construction entrance working drawings to the Town for approval. The working drawings shall show complete construction entrance layout, construction details and installation and removal schedules.

1.4 SYSTEM DESCRIPTION - GENERAL

A. The Contractor's program to control water pollution shall be included in the WPC Plan to prevent, to the extent feasible, any net increase in pollution of storm water runoff from entering waterways.

B. The WPC Plan shall include a water pollution control program (narrative) that graphically indicates where water pollution control measures and temporary erosion control work will be used year round and during all phases of construction.

C. The water pollution control program shall be updated and revised whenever there is a proposed change in construction or operations which may affect the site drainage patterns or discharge of pollutants to surface waters, groundwater, or a separate municipal storm sewer system. The change will be recorded by amending (updating) the plan in accordance with the provisions for plan amendment, which includes revisions to the Water Pollution Control Program (narrative) and graphic changes to the WPC Plan.

D. The WPC Plan shall graphically show the use of temporary drainage inlet protection, check dams, temporary straw (slope protection), and temporary blankets in relation to other water pollution and temporary erosion control and slope protection work specified elsewhere in these technical specifications.

E. All areas of exposed earth created by the Contractor beyond what is shown on the Plans and referred to in the technical specifications shall also be subject to these provisions except that the Contractor shall be fully responsible for all costs and liabilities associated with slope protection work in these areas.

1.5 WATER POLLUTION CONTROL PROGRAM

A. The water pollution control program shall include the following:
   1. A schedule for implementing and maintaining water pollution control measures for all phases of the work.
   2. When temporary sediment basins or sediment traps are used to contain runoff, the following information will be required:
      a. Basin or trap calculations used in sizing these facilities. For design purposes, all soil particles 0.8 mil in size and larger shall be captured.

Basin efficiency will be evaluated in trapping all soil particles 0.8 mil or larger in size.

b. Soil loss calculations shall be based on a storm of at least a 10-year, 6-hour frequency.

c. The shed area contributing runoff to individual basins or traps.

d. The settling and storage depth of each basin or trap. A 24-in minimum depth for settling and storage will be required for sediment traps.

3. A description of the methods of temporary or permanent erosion control that will be implemented to stabilize permanent, temporary and on-going work.

B. The water pollution control program shall also direct attention to other sections in the WPC Plan, which apply to the program for water pollution control.

C. The water pollution program submitted as part of the WPC Plan shall include the Contractor's plans for temporary erosion control measures for all phases of the work. Refer to temporary erosion control requirements specified herein.

1.6 SYSTEM DESCRIPTION - WATER POLLUTION CONTROL PLAN

A. The WPC Plan shall include a site map that is a combination of the contract drainage, stage construction, and contour grading plans and showing water pollution control components. Contractor shall update this site map and the WPC Plan to accurately show the actual site conditions at various phases of construction.

B. The WPC Plan shall include graphic representation of conditions, measures, and features as specified and as required in the permit.

C. The site conditions, measures and facilities graphically shown on the plan and included in the schedule of values shall, at a minimum, include:

1. The Contractor shall include the following minimum quantities of water pollution control measures:

Silt Fencing	150 feet
Drainage Inlet Protection	2 each
Concrete Washout Area	1 each
Construction Entrance	1 each
Stockpile Cover	400 sq ft
Sand Bag	20 feet
Fiber Roll	150 feet

2. The current stage and phase of construction and all other planned improvements throughout the construction period.
3. All exposed graded surfaces, finished and unfinished construction slopes, stockpiles, haul roads and storage areas, top and toe of slope lines and drainage arrows shall be graphically shown.
4. Drainage patterns within each shed area (shown by slope arrows) and the drainage system or containment area where runoff will be conveyed for removal or storage. Drainage swales, temporary culverts, active and inactive drainage inlets, gutters and dikes, and any basin locations shall be clearly shown as a minimum.
5. Where offsite water enters or exits the site.

6. The Contractor shall focus on identifying, as a minimum, storage facilities, concrete washout areas and proposed earthen stockpile locations. Precautionary water pollution control measures shall also be shown and may consist of providing drainage inlet protection around or temporarily capping selected drainage systems within areas of active construction. The Town will, and Contractor shall, monitor the weather forecast to anticipate if inclement weather is approaching. Uncapping drainage inlets and providing measures to trap sediments should be installed before the storm. The Contractor shall reinstall precautionary measures as required after the storm event.
7. Any additional requirements of the permit as referenced elsewhere in this Section and not covered in the above noted items.

1.7 WATER POLLUTION CONTROL MAINTENANCE PROGRAM

A. The Contractor shall furnish sufficient personnel, materials and adequate equipment to perform the water pollution control maintenance work immediately and to work continuously until its completion.

B. Water Pollution Control Maintenance Work. Water pollution control maintenance work shall consist of maintaining water pollution control measures during the water pollution control maintenance periods as defined herein.

C. Each water pollution control maintenance period shall be through the duration of the construction period.

1.8 SYSTEM DESCRIPTION - WATER POLLUTION CONTROL MEASURES

A. Water pollution control measures shall be constructed and functioning year round throughout the construction period. From April 1 to September 14, the Contractor shall install water pollution control measures to prevent discharges into storm drain systems and natural drainage channels. The emphasis during this period will be to install precautionary measures in the event a storm occurs. However, water pollution control measures shall be installed and functioning as provided below. Water pollution control measures shall include the measures specified herein.

B. The Contractor shall install precautionary measures including drainage inlet protection around the immediate perimeter of each active storm drain system within construction work areas.

C. If work in any area has not progressed to a point where all or part of the facilities on the WPC Plan for that area can be constructed, the Contractor shall construct such supplementary temporary water pollution control facilities as are necessary to protect adjacent private and public properties and drainage systems.

D. No earthen materials shall be stockpiled within 50 feet of drainage inlets. All stockpiles of earthen materials shall have appropriate erosion control measures installed to abate and control erosion.

E. By September 15, water pollution control measures shall be constructed and functioning to prevent water pollution from areas where portions of the contract are completed for that year and no further earthwork is planned. In all areas where

earthwork and construction will continue during the September 15 through March 31 period, the following shall apply:

a. Water pollution control measures, hereafter noted as measures, shall be implemented as practicable to control runoff and to allow earthwork to continue. This may include removing and reinstalling erosion control measures to allow ingress or egress of construction equipment into work areas.

b. Special attention will be required to protect areas which have been cleared and grubbed before excavation or embankment operations, and which are subject to runoff during the period from September 15 to March 31. Temporary measures may include, but shall not be limited to: temporary desilting basins; contour graded ditches; temporary paved and unpaved ditches; and filter fabric fences to filter silt and sediment from runoff.

c. After each storm, desilting basins shall be checked against their design capacity and if necessary, silt and sediment shall be removed to restore capacity. Sediments removed shall be disposed of or relocated, stockpiled and ringed with silt fence material to prevent erosion back into retention areas.

d. Active drainage inlets where runoff is likely to go shall have drainage inlet protection installed around the immediate perimeter of the inlet as noted on the Plans. The perimeter of each individual work area shall have measures installed to control sediments that would otherwise leave the work area.

e. If there is no active drainage system within each individual work area, the Contractor shall submit a plan proposing measures to de-silt and remove runoff from active construction areas. This may include the use of sediment basins, sediment traps and a pumping system to remove de-silted runoff from basins or traps.

f. The minimum capacity of each desilting basin shall be constructed with a capacity of 1860 cuft/acre (slope measurement) of disturbed ground.

g. Staging and work areas shall be kept orderly with neat stockpiling of construction materials. Measures shall be installed at the entrance and exits of staging and work areas to control mud from entering the roadway pavement.

h. The Town will and the Contractor shall monitor the weather forecast on a daily basis. If rain is predicted within 48 hours, construction scheduling shall be modified, as required, to provide functioning water pollution control measures before the onset of the rains.

i. Water pollution control materials (silt fence) shall be stockpiled on the site in sufficient quantities to stabilize any problem areas within 24 hours. The Contractor shall replenish his stockpiles of material as required to quickly install measures before an anticipated rain, as determined by the Town.

j. The Contractor shall have adequate labor on hand to install and maintain water pollution control measures within 24 hours following notification by the Town.

1.9 SYSTEM REQUIREMENTS - TEMPORARY EROSION CONTROL

A. Temporary erosion control shall including constructing such facilities and taking such measures as are necessary to prevent, control, and abate water, mud, and erosion damage to public and private property as a result of the construction of this project. Temporary erosion control shall apply year round to all areas where earthen material is exposed and shall not be limited to those areas outlined in these technical specifications or as shown on the Plans.

B. All areas of exposed earth created by the Contractor beyond what is shown on the Plans and referred to in the technical specifications and areas cleared and grubbed before excavation or embankment operations which are subject to wind erosion and runoff shall also be subject to these technical specifications, except that the Contractor shall be fully responsible for all costs and liabilities associated with water pollution and temporary erosion control work in these areas.

C. As a minimum, the program shall provide for the following:
   1. If sediment basins are used, rainfall intensity expected from a storm of at least a 10-year 6-hour frequency/duration, shall be used to calculate basin capacity.

D. Construction or implementation of temporary erosion control measures shall be performed year round. By September 15 of each year such temporary erosion control features as are necessary to prevent damage during the forthcoming winter season shall be constructed and functioning. If the earthwork in any area has not progressed to a point where all or part of the facilities on the WPC Plans for that area can be constructed, the Contractor shall construct such supplementary temporary erosion control facilities as are necessary to protect adjacent private and public property.

E. The Contractor shall use the pollution control measures outlined in the Plans and referenced in these technical specifications as part of the overall program to control erosion and silt runoff. If the Contractor elects to modify the construction details, modified details shall be submitted to the Town for review. Approval to use modified erosion control facilities shall be obtained in writing from the Town. From September 15 to March 31, the Contractor shall comply with the requirements outlined in Water Pollution control measures for performing active construction.

F. Temporary erosion control facilities and measures to be used shall include the following:
   1. The Contractor shall conduct his operations in such a manner that storm runoff will be contained within the project or channeled into the storm drain system which serves the runoff area. Storm runoff from 1 area shall not be allowed to divert to another runoff area.
   2. Storm drain systems, toe of slope drains, and outlet structures shall be constructed and operating before, or concurrently with, constructing an embankment. Temporary down drains, drainage structures, and other devices shall be provided to channel storm runoff water into the respective permanent storm drain systems during construction. Permanent drainage structures, not fully completed, shall be modified as required to accept de-silted runoff.
   3. Embankment areas, while being brought to grade, and during periods of completion before final roadbed construction, shall be protected by various measures to eliminate erosion and the siltation of downstream facilities and adjacent areas. These measures may include the following:
      a. Temporary down drains, either in the form of pipes or paved ditches with protected outfall areas.
      b. Graded berms around areas to eliminate erosion of embankment slopes by surface runoff.
      c. Embankment slopes, not included as part of the roadway construction contract and constructed by the contractor for temporary

access roads, shall be compacted by track-walking the face of the slope in a direction perpendicular to the slope contours. Several passes may be required to adequately compact the slope face.

4. Excavation areas, while being brought to grade, shall be protected from erosion and the resulting siltation of downstream facilities and adjacent areas by the use of various temporary erosion control measures. These measures may include, but shall not be limited to:
   a. Check dams/Fiber rolls
   b. Silt fence
   c. Protection around inlets, which have not been brought up to grade.
   d. Protection around flared end sections.
5. Contour graded areas shall be protected against erosion and the resulting siltation of downstream facilities and adjacent areas during grading operations. Various measures may include, but shall not be limited to: the use of graded contour berms to control sheet flow; supplemental grading of large areas around temporary or unfinished inlet structures, such as inside ramp loops; and temporary ditch paving.

   All temporary erosion control facilities shall be maintained during temporary suspension of work periods.

1.10 SITE CONDITIONS

A. A copy of the WPC Plan, together with updates, revisions and amendments shall be kept at the construction site. At the request of the Town, the Contractor shall furnish multiple copies of the WPC Plan for distribution.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Materials (not all listed shall be used) shall conform to the provisions in Section 20-2, “Materials,” of the Caltrans Standard Specifications and these technical specifications.

B. Sediment Bag:
   1. Fabric: Sedimentation control fabric for sediment bags shall be a prefabricated sedimentation control fabric envelope with a woven polypropylene fabric and sewn with a double stitched seam using nylon thread. The fabric shall conform to the provisions in Section 88-1.03, “Filter Fabric,” of the Caltrans Standard Specifications.
   2. Bag: The sediment bag shall be sized to fit the catch basin or drop inlet and be complete with lifting hoops and dump straps attached at the bottom to facilitate emptying of the sediment bag. The sediment bags shall have a restraint cord approximately halfway up the bag to keep the sides away from the catch basin walls.

C. Rock Bag:
   1. Rock bag fabric shall be woven polypropylene, polyethylene or Polymide with a minimum unit weight of 0.03 lb/ft^2. The fabric shall have a mullen burst strength of at least 300 lb/in^2in accordance with ASTM D3786 and an ultraviolet (UV) stability exceeding 70 percent.

2. Rock bags shall have a length of 24in to 31in, width of 16in to 18in, thickness of 6in to 8in, and weight of 80lb to 120lb.
3. Rock bag fill material shall be non-cohesive, gravel, free from deleterious material.

D. Sedimentation Control Fabric: Sedimentation control fabric shall conform to the requirements in Section 88 of the Caltrans Standard Specifications and to the requirements under "Temporary Drainage Inlet Protection" elsewhere in these technical specifications.
1. Materials shall not have been used.

E. Rock for construction entrances shall be Class 3 permeable material and shall conform to the provisions in Section 68-1.025, "Permeable Material," of the Caltrans Standard Specifications and these technical specifications.

F. Reinforcing Fabric: Reinforcing fabric for construction entrances shall be manufactured from 1 or more of the following materials: polyester, nylon or polypropylene. Reinforcing fabric shall be woven, permeable and shall conform to the following specifications:

Characteristic	ASTM	Requirement
Grab Tensile Strength lb (Average of Warp and Fill) min.	D1682	190
Elongation, percent max.	D1682	35

1. The reinforcing fabric shall be furnished in an appropriate protective cover, which shall protect it from ultraviolet radiation and from abrasion due to shipping and handling.

G. Temporary Blanket. Temporary blanket shall conform to the provisions in Section 20-2, "Materials," of the Caltrans Standard Specifications and these technical specifications.

PART 3 - EXECUTION

3.1 TEMPORARY DRAINAGE INLET PROTECTIONS

A. Temporary drainage inlet protection shall be installed, maintained and later removed as shown on the Plans, as specified in these technical specifications, and as directed by the Town. Temporary drainage inlet protection shall be installed at each drainage system box location where runoff will enter the storm water system.

B. The Contractor shall use temporary drainage inlet protection as one of the various measures to prevent water pollution.

C. Sediment bags shall be installed by removing the drainage inlet grate, placing the sediment bag in the opening, and replacing the grate to secure the sediment bag in place. Removal of the bag shall be facilitated by the use of 10-inch long steel reinforcing bars placed through the lifting hoops.

D. Sediment bags installed, as part of temporary drainage inlet protection shall be emptied when the restraint cords are no longer visible. Emptying of the bags shall

be facilitated by the use of 10-inch long steel reinforcing bars placed through the dumping hoops. The sediment bag shall be emptied of material with a shovel and rinsed before replacement in the catch basin or drop inlet.

E. The storage capacity of the sump area around each drain inlet shall be maintained to provide for maximum capacity and as directed by Town of Woodside.

F. When no longer required for the purpose, as determined by the Town, temporary drainage inlet protection facilities shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the Worksite.

3.2 TEMPORARY FIBER ROLL

A. Temporary fiber rolls shall be installed as shown on the plans and in conformance with construction detail sheet.

B. Temporary fiber rolls shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. When no longer required for the intended purpose, as determined by the Town, temporary fiber rolls shall be removed from the site of the work.

3.3 TEMPORARY CONCRETE WASHOUT FACILITY

A. Temporary concrete washout facility shall be constructed, maintained and later removed as shown on the Plans, as specified in these technical specifications and as directed by the Town. The work shall consist of furnishing all materials and installing concrete washouts at locations identified on the plans and as directed by the Town.

3.4 TEMPORARY CONSTRUCTION ENTRANCE

A. Temporary construction entrance shall be constructed, maintained and later removed as shown on the Plans, as specified in these technical specifications and as directed by the Town. The work shall consist of furnishing all materials and installing construction entrances at points of construction ingress and egress for the purpose of reducing the amount of sediments and other pollutants tracked onto paved roadways.

B. Temporary construction entrances shall be removed immediately following completion of work at the above locations and as directed by Town.

C. The reinforcing fabric for construction entrances shall be handled and placed in accordance with the manufacturer's recommendations. A 24-inch minimum overlap will be required at adjoining pieces. Care shall be taken to install the fabric taut and aligned with as little wrinkling as possible. Should the fabric be damaged during placing, the torn or punctured sections shall be repaired as required and shall meet overlapping requirements. Damage incurred due to the Contractor's vehicles, equipment or operations shall be repaired by the Contractor at his expense.

D. A 35 inch skirt of reinforcing fabric shall extend beyond the cross sectional limits of the rock bed as shown on the WPC Plan.

E. The temporary construction entrance shall be graded to prevent runoff from leaving the construction site and flowing onto paved roadways.

F. The rock bed shall be spread to a minimum depth of 6 inches. Additional rock shall be added as directed by the Town to maintain the rock bed.

G. At the completion of work at each individual work area as determined by the Town, construction entrances shall be removed in their entirety.

3.5 TEMPORARY SILT FENCE

A. Wood posts shall be an integral part of the silt fence and shall be packaged with the silt fence fabric. Wood posts shall be a minimum of 4 ft in length.

B. Concrete footings for wood posts will not be required.

C. Temporary silt fences that are damaged from any cause during the progress of the work shall be repaired or replaced by the Contractor at his expense. The Contractor shall repair any damaged temporary silt fences as directed by Town.

D. When no longer required for the purpose as determined by the Town, temporary silt fence shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the Worksite.

3.6 TEMPORARY COVER

A. Temporary cover shall be furnished and installed, as specified in these technical specifications, as shown on the Plans and at locations designated by the Town.

B. Contractor shall use temporary cover as one of the various measures to prevent water pollution.

C. Temporary cover shall be installed at locations designated by the Town and shall be installed to control erosion on critical areas of unfinished earthwork slopes not currently identifiable.

D. When no longer required for the purpose as determined by the Town, temporary cover shall be abandoned or removed as directed by Town.

3.7 RESTORATION

A. Holes, depressions, sumps or any other ground disturbance caused by the removal of the drainage inlet protection facilities, check dams, shall be backfilled and repaired in accordance with the provisions in the second paragraph of Section 15-1.02, “Preservation of Property,” of the Caltrans Standard Specifications.

PART 4 -- MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. The work included for water pollution control and temporary erosion control measures will be measured for payment as a lump sum price.

B. The contract lump price paid for water pollution control and temporary erosion control measures shall include full compensation for furnishing all labor, materials,

tools, equipment and incidentals for doing all the work involved, complete and in place, as shown on the plans, as specified in these specifications and as directed by the Engineer.

END OF SECTION 00 1800

SECTION 00 2000 – ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing, Division 0 & 1, including Doc. 007200 General Conditions and technical specifications apply to this Section

B. Section Includes:

1. Asphaltic concrete paving, wearing, binder and base course for trench restoration.

1.2 DESCRIPTION OF WORK

A. Drainage swale as shown on the plan. (For material specification, refer to Section 00 4200 – Timber Lagging Retaining Wall)

B. Performance requirements:

1. Minimum thickness: 6 inch.

1.3 SUBMITTALS

A. General: Submit under the provisions of Document 007200, General Conditions, and Submittals.

B. Product Data: Submit product information for all proposed products.

C. Design Data: Submit mix design per Section 39 for each asphalt concrete mix and seal coat to be used.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans and Specifications.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 – PRODUCTS

2.1 FLEXIBLE PAVEMENT

A. Asphalt Cement: As shown on plans and in accordance with Caltrans Standard Plans and Specifications.

2.2 ASPHALT PAVING MIX

A. Use dry material to avoid foaming. Mix uniformly.

B. Asphalt mix: HMA Type A, with the grading of the combined aggregate conforming to 3/4-inch course grading, and as specified in Section 39 of the Caltrans Standard Specifications.

C. Mix Temperature: In accordance with Caltrans Standard Plans and Specifications

2.3 SOURCE QUALITY CONTROL AND TESTS

Test samples In accordance with Caltrans Standard Plans and Specifications.

PART 3 – EXECUTION

3.1 GENERAL

A. Protect all adjacent features to remain. Repair any damage or replace to satisfaction of Engineer.

3.2 EXAMINATION

A. Verify gradients and elevations of base.

B. Verify compacted asphalt, subgrade and subbase is dry and ready to support paving and imposed loads as specified for the material involved. Remove loose and un-compacted material in accordance with Caltrans Standard Specification Section 39.

3.3 PREPARATION

A. Apply primer in accordance with Caltrans Standard Plans and Specifications.

B. Use clean sand to blot excess primer.

C. Apply type SS1/SS1h tack coat in accordance with Caltrans Standard Plans and Specifications

D. Asphalt binder used in HMA Type A must be PG 64-16.

E. Coat surfaces of frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

F. Existing pavements shall be removed to clean straight lines, and seams shall be located at the edge of lanes and not in wheel paths.

3.4 INSTALLATION - ASPHALT PAVEMENT

A. Install asphalt concrete, in two lifts, as shown on plans and in accordance with Caltrans Standard Plans and Specifications.

B. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

C. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 ERECTION TOLERANCES

A. Flatness: In accordance with Caltrans Standard Plans and Specifications.

B. Scheduled Compacted Thickness: In accordance with Caltrans Standard Plans and Specifications.

C. Variation from Indicated Elevation: In accordance with Caltrans Standard Plans and Specifications.

D. Relative compaction to be 95% min.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Asphalt Concrete shall be measured by ton installed.

4.2 PAYMENT

A. No separate measurement and payment will be made for drainage swale. Full compensation for drainage swale as shown on the plan shall be considered to be included in the unit prices paid for Asphalt Paving.

END OF SECTION 00 2000

SECTION 00 2100 - SANITARY SEWAGE MANHOLE AND WET WELL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wet well, sanitary sewer gravity/force main

B. Pipes, fittings, accessories and bedding, drop manholes, and valve box, etc.

C. Related Sections
   1. Section 02400 – Concrete, Grout, and Precast Structures

1.2 REFERENCES

A. AASHTO T180 (American Association of State Highway and Transportation Officials) - Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18-in. Drop.

B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.

C. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.

D. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.

E. ANSI/ASTM D2729 – Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.

F. ASTM D1785 – Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.

G. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

H. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over structure, prior to subsequent backfill operations.

1.4 SUBMITTALS

A. General: Submit under the provisions of Document 00 7200, General Conditions, submittal.

B. Submit shop drawings and manufacturers data in accordance with the provisions of Division I, General Conditions

C. Shop Drawings: Indicate wet well, manhole locations, elevations, piping and sizes and elevations of penetrations.

D. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

E. Copy of Certificate or Report showing that the Precast Concrete Manufacturer conforms of this specification.

F. Certificates and Compliance. Certificates of compliance shall be provided for all products and materials proposed to be used under this Section as specified in the referenced standards of the following supplemental requirements:

G. Calculation and Details of Precast Concrete Structural Sections, including buoyancy calculations to be provided and sealed by a Professional Engineer, registered in the California, employed by the Manufacturer showing or charting the following:

1. Manufacturer's Part No. or Catalogue No.
2. Inside diameter and height excluding base slab
3. Wall thickness and base or top thickness where applicable
4. Handling weight and lifting hole or loop description and locations
5. Wire size, spacing, location, and steel area provided per vertical foot
6. Reinforcing bar grade, size, spacing and location.
7. Design load for Flat Slab.
8. Concrete mix number and design strength.
9. Height, width, slope and annular space of the tongue and groove.

H. Pipe Connector Details, Material Specification and pipe installation procedure.

I. Joint Material Details and Material Specifications. Calculations showing the Flexible Joint Sealant cross section.

J. Lifting Device and Hole Details that include design loads.

K. Structural analysis design calculations for Flab Slab Top Precast Components, performed in accordance with the Reference of this Specification, showing that allowable stresses with not be exceeded. All calculations must be sealed by a Professional Engineer, registered in the State of California.

L. Calculations or test results verifying that the lifting device components and holes are designed in accordance with OSHA Standard.

M. Concrete 28 day compression strength results for every day production of Precast Components for the project was performed, showing the required strength according to the guidelines established in ACI 318.

N. Reinforcing and Cement mill reports for materials used in the Manufacture of Precast Components for this project.

1.5 CLOSEOUT SUBMITTALS

A. Accurately record actual locations embedded items, utilities, and components which are concealed from view. Submit to the Town of Woodside at project closeout

B. Project Record Documents: Record location of pump stations, control panel, pipe runs, connections, manholes, valve box, cleanouts, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

D. All tests and inspection reports and all transit mix delivery slips

1.6 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated.

1.7 COORDINATION

A. Coordinate the Work with termination of sanitary sewer laterals at property lines, connection to sewer mains, and trenching.

1.8 QUALITY ASSURANCE

A. Per work in accordance with ACI301, California Plumbing Code.

B. Maintain one copy of latest construction documents on site; including design drawings, approved shop drawings and permit drawings, and special inspection and testing agreement.

C. Acquire cement and aggregate from same source for all work.

D. Perform Sewer Work in accordance with West Bay Sanitary District and Town of Woodside Standards.

PART 2 PRODUCTS

2.1 WET WELL and MANHOLE MATERIALS

A. Reinforcing steel shall be ASTM A615 Grade 60 deformed bar, ASTM A706. Welded wire fabric shall conform to latest edition of CRSI Manual of Standard Practice.

B. Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars are not allowed

C. Barrel Sections: Wet well and Manhole barrel sections are to be pre-cast 72-inch and 48-inch diameter reinforced concrete, respectively, per the PLANS. Barrel sections are to be lined with CIM 1000 Urethane Coating (See Section 00 2300), or approved equal, to be installed during barrel casting process. Joints to be sealed per the manufacturer's specifications. Manhole/Wet Well bases to be coated with the same or similar approved coating material.

D. Precast Flat Slab Top Section shall be designed for HS-20 traffic loading as defined in ASTM C890.

E. Wet Well Lid: Lid shall be precast with opening to accommodate the Flygt Safety Hatch. Dimensions are shown on the PLANS. Lid shall have the CIM 1000 Urethane Coating installed at the casting plant.

F. Flygt Safety Access Hatch. The contractor shall provide and install one Flygt Safety Access Hatch, Model FLE-HD, 36”x48” with Safety Grate system. Hatch shall be H-20 rated. Refer to the Manufacturer’s specifications for exact dimensions and installation instructions. The Contractor shall place the order for these items well in advance of the construction start date to insure that there is no delay in construction due to lack of these parts.

G. Flygt 4-in Discharge Mounting Elbow. The contractor shall provide and install two (2) Flygt 4-in diameter ninety degree (90°) discharge mounting elbows in the wet well. These items are specific to the Flygt 3127 submersible pumps (with 4-in discharge) and must be ordered from ITT Flygt or a distributor. The Contractor shall place the order for these items well in advance of the construction start date to insure that there is no delay in construction due to lack of these parts.

H. Pump Equipment: The Contractor will be responsible for providing two Flygt submersible pumps and all associated electrical motor cables to the Contractor for installation into the wet well. All pump controls and wiring are to be installed under this contract for this project.

I. Pump Guide Rails. Two sets of stainless steel pump guide rails will be installed by the Contractor in the wet well. Each guide rail pair will consist of 2-in diameter stainless steel pipe mounted to the top of the wet well with upper guide rail brackets. The upper guide rail brackets will be fastened to the wet well lid with stainless steel bolts with drilled holes filled with epoxy.

J. Wet Well Cable Brackets. The contractor shall install two stainless steel cable hooks in the wet well lid. Hooks will be sized to accommodate the motor cable and float cables.

K. Wet Well Vent. The wet well vent shall be 4-in diameter PVC SDR 26 pipe, sloping toward the wet well at two percent (2%), as shown on the PLANS. The steel casing for the vent pipe shall be Schedule 40 steel pipe, with a bituminous coating applied on all areas below the ground surface and painted with a weatherproof paint, per the PLANS. A 4-inch PVC Ball Valve, Nibco or approved equal, shall be installed on the vent pipe per the PLANS.

2.2 MANHOLES

A. Concentric Manholes, Sanitary Manhole, including frames and covers shall conform to the West Bay Sanitary District Standard Details and Town of Woodside.

B. Outside and Inside Sanitary Sewer Drop Manholes: When fall across a manhole exceeds 2' from the invert of the upper to the invert of the lower pipe, an outside or inside drop shall be constructed. The outside/inside drop shall be constructed of SDR-26 PVC pipe and gasket PVC fittings. The drop pipe shall be supported with stainless steel straps spaced 4' apart. If the drop pipe is less than 4' in length, a minimum of two straps shall be installed, evenly spaced on the length of the pipe. The lower fitting shall be supported by a concrete pad which is poured on compacted dirt.

C. Manhole Sections: Reinforced precast concrete in accordance with ASTM C478 with resilient flexible gaskets in accordance with ASTM C923.

D. Covers: Heavy Duty, Non Rocking, Solid, Pressure Type, Bolt down cover, labeled "Sewer". Frames and covers shall be certified by the manufacturer for use under AASHTO HS-20 loading conditions as a minimum. Frames and covers shall be smooth, well-cleaned and give a bituminous coating which is tough and tenacious when hot and not tacky or brittle.

E. Base Pad: Cast-in-place concrete of type specified in Structural Cast-In-Place Concrete.

F. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe sections.

G. Pipe Entry: Furnish openings as indicated on Drawings

2.3 SEAL EXISTING MANHOLE COVERS

A. Existing manholes on Town Center Pump Station, as shown on the PLANS, shall have the frames and covers cleaned of all dirt and debris. The Contractor shall apply a layer of silicone sealant, DAP Silicone Sealant (Clear), or approved equal, on the mating surface between the manhole frame and cover to provide an airtight seal. All existing pick holes or openings in the manhole covers shall be sealed in a similar manner to provide an airtight seal.

2.4 CONCRETE MATERIALS

A. Cement: ASTM C150, Caltrans Standard Specifications Section 90, Type II, and shall be provided by one manufacturer.

B. Water: Clean, potable, and not detrimental to concrete. Contractor may obtain water from Cal Water with a temporary meter connected to a fire hydrant.

2.5 ADMIXTURES

A. No admixtures shall be allowed without written acceptance by the Town. Admixtures that have a negative impact on concrete finish shall not be used. When more than one admixture is used, admixtures shall be compatible. Provide letter from admixture manufacturer that it is appropriate for proposed mix design.

B. Air Entrainment: ASTM C260; “Daravair”, “Micro-Air”, manufactured by W.R. Grace, Master Builders or equal.

2.6 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94.

B. Addition of water to the mix after leaving the plant is not permitted.

C. Provide concrete to the following criteria:

1. Normal Weight Aggregate.
2. Water/Cement Ratio (maximum): 50 percent by weight.
3. Aggregate Size (maximum): 1-1/2 inch.
4. Slump: 4 inches.
5. Drying Shrinkage Limit: 0.04 percent. Drying shrinkage limit is percentage of change in length after 21 days of drying when tested per ASTM C157.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located

B. Verify trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on approved drawings.

C. Inspect Precast Structure Components prior to unloading from the delivery truck.

D. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION & INSTALLATION

A. Product Delivery, Storage, and Handling: Coordinate delivery with the manufacturer. Handle and store the Precast Components in accordance with ASTM C891 and the manufacture’s recommendations using method that will prevent damage to the components and their joint surfaces.

B. Coordinate placement of inlet and outlet pipe or sleeves required by other sections

C. Do not install structures where site conditions induce loads exceeding structural capacity of structures.

D. Protect and adjust to finished grade all dry wells, drains, clean-outs, valve boxes, manholes etc.

E. Excavate and provide shoring as required and as specified elsewhere in this specification.

F. Backfill over excavation with ¾" crushed rock. Remove large stones or other hard matter, which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

A. Place bedding material at trench bottom, level materials in continuous layer not exceeding six (6) inches compacted depth, compact to 95 percent.

B. Maintain optimum moisture content of bedding material to attain required compaction density.

C. Use 8 inch thick Class 2 Aggregate Base for bedding below concrete manhole and wet well base.

3.4 FIELD QUALITY CONTROL

A. Request inspection prior to and immediately after placing bedding.

B. Compaction Testing: In accordance with ANSI/ASTM D1557.

C. Pressure Test for Gravity Sewers: Test in accordance with manufacturer's recommendation. PVC pipe shall be air pressure test in accordance with the test procedures outlined in Green Book Section 306-1.4.4, Amendment 3061.4.4.1, and the low Pressure Air Test for Sanitary Sewers as published by the National Clay Pipe Institute. The test shall be made only after the line has been properly installed including any necessary test fittings, and backfilled.

D. Test plugs shall be carefully placed at each end of the section of the line to be tested. When all necessary test equipment is in place, a compressed air supple shall be attached within the line and increased to four (4) pounds per square inch (4 psi). After the air supply is securely turned off or disconnected, there shall be a two (2) minute waiting period to allow stabilization of air within the sewer line before the actual test period begins. Air may be added only to maintain a pressure of 4.0 psig. When the internal pressure decreases to 3.5 psig, timing shall start and the seconds counted until the pressure has decreased to 2.5 psig.

E. Minimum permissible pressure holding times for sewer main, with or without laterals, are listed in the NCPI Air Test Tables, as published in the latest National Clay Pipe Institutes "Low Pressure Air Test for Sanitary Sewers (Procedures and Tables)." The maximum length of a line that may be tested at one time shall be five hundred (500) feet, or the length between any two (2) adjacent manholes, or where otherwise directed by the District Engineer. After completion of the test, the air pressure shall be released slowly through the valve, which is incorporated in the test equipment. Air test plugs shall not be removed until the air pressure is no longer measurable.

F. Pressure tests for sewer force mains: The allowable leakage shall be zero (0).

All leak points shall be located and stopped. All defective pipes, fittings, valves and other appurtenances discovered shall be removed and replaced with sound material and tests repeated until the leakage is zero (0).

G. Deflection Test: Test in accordance with manufacturer's recommended tolerances.

H. Flushing and Cleaning Sewer Lines: After all surface restoration and repairs have been completed newly installed mains shall be flushed and cleaned of all debris by use of a "MacWane Ball" and sand ells to trap foreign materials in accordance with the methods set forth in the Standard Specifications of the Town of Woodside.

I. Watertightness shall be tested with a minimum head of 20 feet of water above invert for 30 minutes per the Town of Woodside, Caltrans Standard Specification Section 61 "Culvert and Drainage Pipe Joints" and the California Plumbing Code Section 1109 "Testing".

J. When tests indicate Work does not meet specified requirements, remove work, replace to satisfaction of the Town representatives and retest.

K. Provide free access to Work and cooperative with the Town, Town's representatives, and Special Inspector.

3.5 PROTECTION OF FINISHED INSTALLATION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

B. Protect manhole channels with temporary (two-piece) ½ inch thick plywood covers to remain in place until all work is complete and ready for acceptance. Until standard cast frames and covers are in place, manholes shall be protected with a suitable steel plate over the top in addition to plywood covers at the base.

C. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

D. Repair or replacement of defective concrete will be determined by the Town.

E. No additional compensation will be allowed for repair of defective concrete

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. The contract unit price paid for rehabilitation of existing wet well will be paid per each.

B. Concentric Manhole, Inside Drop Manhole, 72" Wet Well Barrel, 72" diameter precast wet well top (frame), and Flygt 48" x 60" Safety Hatch Cover (FLE-HD) will be measured per each.

4.2 PAYMENT

A. Item of work required for re-channelization of the bottom of existing sanitary sewer manhole will be measured separately for payment and shall be considered to be included in the payment made for Rehabilitate Existing Wet Well (Section 00 2100).

END OF SECTION 00 2100

SECTION 00 2300 - CIM 1000 URETHANE COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. High-performance coatings for concrete wet wells and manholes used for the containment of wastewater. High-performance coating rapidly cures to form a seamless, abrasion resistant, and chemical resistant waterproof liner. Coating will be installed at the precast wet well and manhole manufacturer's facility prior to shipping to the project site. Additional coating materials shall be applied as necessary by a qualified installer on the project site per the manufacturer's specifications.

1.2 RELATED SECTIONS

A. 00 2100 Sanitary Sewage Manhole and Wet Well.

1.3 REFERENCES

A. ACI 201.1R – Guide for Making a Condition Survey of Concrete in Service.

B. ASTM C836 – High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.

C. ASTM C957 – High Solids Content, Cold-Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface.

D. ASTM D36 – Softening Point of Bitumen (Ring-and-Ball Apparatus).

E. ASTM D412 – Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers – Tension.

F. ASTM D624 – Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

G. ASTM D648 – Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.

H. ASTM D751 – Coated Fabrics.

I. ASTM D822 – Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

J. ASTM D1117 – Evaluation Nonwoven Fabric.

K. ASTM D1682 – Breaking Load and Elongation of Textile Fabric.

L. ASTM D2240 – Rubber Property – Durometer Hardness.

M. ASTM D3786 – Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method.

N. ASTM D4060 – Abrasion Resistance of Organic Coatings by the Taber Abraser.

O. ASTM D4258 – Surface Cleaning Concrete for Coating.

P. ASTM D4259-88 – Abrading Concrete.

Q. ASTM D4263 – Indicating Moisture in Concrete by the Plastic Sheet Method.

R. ASTM D4285 – Indicating Oil or Water in Compressed Air.

S. ASTM E96 – Water Vapor Transmission of Materials.

T. ICRI 03732 – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymers Overlays.

U. SSPC-SP10/NACE No. 2 – Near-White Blast Cleaning.

V. SSPC-SP6/NACE No. 3 – Commercial Blast Cleaning.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data, including surface preparation, application, and curing.

B. Samples: Submit 3-inch by 1-inch samples for approval by the Engineer, if required.
   1. Cured high-performance coating, 60 mils thick.
   2. Reinforcing fabric and joint cover sheet.

C. Applicator's Project References: Submit list of completed project references.

D. Certification of Applicator's Supervisor: Submit for applicator's supervisor a certificate indicating completion of manufacture's contractor training program.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Applicator: Use applicator experienced in the application of the specified high-performance coating for a minimum of 2-years on projects of similar size and complexity. Provide a list of completed projects including project name and location, name of engineer, name of coating manufacturer, and approximate quantity of coating applied.
   2. Applicator's Supervisor: Employ a supervisor during all phases of the work that had successfully completed manufacturer's contractor training program.
   3. Applicator's Personnel: Employ persons trained for the application of high-performance coating.
   4. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM standards.
   5. Applicators shall use approved specialty equipment adequate in size, capacity and number sufficient to accomplish the work of this Section in a timely manner.

B. Regulatory Requirements: Comply with environmental regulations.

C. Pre-Application Meeting:

1. Not Required.

1.6 DELIVERY, STORAGE, AND HANDLNG

A. Delivery:
1. Deliver materials to the site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
2. Do not deliver material to site more than one month before use.

B. Storage:
1. Store the material in accordance with manufacturer's instructions.
2. Store materials indoor in an area well ventilated and protected from damage.
3. Do not store material near open flame, sparks, or hot surfaces.
4. Store materials on raised platforms and covered by waterproofing covers.
5. Keep material containers closed.

C. Handling: Protect materials during handling and application to prevent damage.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not apply in wet weather or when rain is imminent.

B. Apply when the surface is a minimum 50 degrees F and a minimum of 5 degrees F above dew point. Consult manufacturer for application instructions if the ambient or surface temperature is below 50 degrees F.

C. Do not apply to porous substrates when substrate or ambient temperatures are rising.

D. Do not apply to porous substrates when substrate is in direct sunlight.

E. Do not apply over substrates that are frozen or contain frost.

1.8 WARRANTY

A. Provide a 5-year material and 1-year labor warranty.

1.9 SAFETY

B. Applicator shall perform his work in a manner to protect the health and safety of all workmen and the public
C. All work shall be in accordance with standard industry safety practices.
D. All work, including entry into confined spaces shall be performed in strict compliance with current OSHA regulations.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. C.I.M. Industries Inc., 23 Elm Street, Peterborough NH 03458. Phone (603) 924-9481. Toll Free (800) 543-3458. Fax (603) 924-9482.

2.2 HIGH-PERFORMANCE COATINGS

A. High-performance coating: CIM 1000. Two-component, high solids, elastomeric asphalt modified urethane. Designed for spray, squeegee, or roller application.
   1. Elastomeric Waterproofing, ASTM C836 and C957: Exceeds all criteria.
   2. Solids by volume: 88 percent.
   3. Volatile Organic Compounds (VOC): 0.76 pounds per gallon (92 g/L).
   4. Mullen Burst Strength, ASTM D751, 50 mils in CIM Scrim: 150 pounds per square inch.
   5. Tear Strength, ASTM D624, Die C: 150 pounds per inch.
   6. Tensile Strength, ASTM D412, 100-mil sheet: 900 pounds per square inch.
   7. Extension to Break, ASTM D412: 400 percent.
   8. Recovery from 100 Percent Extension:
      a. After 5-minutes: 98 percent.
      b. After 24-hours: 100 percent.
   9. Coating Performance, Crack Bridging:
      a. 10 Cycles at minus 15 degrees F (minus 26 degrees C): Greater than 1/8-inch.
      b. After Heat Aging: Greater then 1/4-inch.
   10. Coating Performance, Weathering, ASTM D822: 5000 hours: no cracking.
   11. Softening Point, ASTM D36: Greater than 325 degrees F (160 degrees C).
   12. Deflection Temperature, ASTM D648: below minus 60 degrees (minus 50 degrees C).
   13. Service Temperature: minus 60 degrees F to 220 degrees F (minus 50 degrees C to 105 degrees C).
   14. Hardness, ASTM D2240, Shore A, 77 degrees F (25 degrees C): 60.
   15. Permeability to Water Vapor, ASTM E96, Method E, 100 degrees F (38 degrees C), 100-mil sheet: 0.03 perms.
   16. Abrasion Resistance, Weight Loss, ASTM D4060: 1.2 mg.
   17. Adhesion to Concrete, Dry, Elcometer: 350 pounds per square inch.
   18. Color: Black.

B. Primer: CIM 61 BG Epoxy Primer. Two-component, high solids, epoxy primer. Use as a primer coat on dry, porous substrates such as concrete.
   1. Solids by Volume: 80 percent mixed.
   2. Volatile Organic Compounds (VOC): 1.41 pounds per gallon (170 g/L).

C. Bonding Agent: CIM Bonding Agent. Organosilane compound dispersed in isopropyl alcohol. Ensures a continuous and uniform bond between surfaces. Use the bonding agent over non-porous surfaces such as steel, except where primer has been installed. Do not use where solvent cleaners are prohibited.
   1. Solids by Volume: Less then 1 percent.
   2. Volatile Organic Compounds (VOC): 6.4 pounds per gallon (743 g/L).

D. Patching Material: CIM 1000 Trowel Grade. Liquid applied, chemical and corrosion resistant urethane elastomer, chemically thickened to allow trowel application with minimum sag. Use as a crack filler and for application to vertical surfaces and cold joints.
   1. Elastomeric Waterproofing, ASTM C836 and C957: Exceeds all criteria.

2. Solids by volume: 89 percent.
3. Volatile Organic Compounds (VOC): 0.74 pounds per gallon (88 g/L).
4. Mullen Burst Strength, ASTM D751, 50 mils in CIM Scrim: 150 pounds per square inch.
5. Tear Strength, ASTM624, Die C: 150 pounds per inch.
6. Tensile Strength, ASTM D412, 100-mil sheet: 800 pounds per square inch.
7. Extension to Break, ASTM D412: 300 percent.
8. Recovery from 100 Percent Extention:
   a. After 5-minutes: 98 percent.
   b. After 24-hours: 100 percent.
9. Coating Performance, Crack Bridging:
   a. 10 Cycles at minus 15 degrees F (minus 26 degrees C): Greater than 1/8-inch.
   b. After Heat Aging: Greater then 1/4-inch.
10. Coating Performance, Weathering, ASTM D 822: 5000 hours: no cracking.
11. Softening Point, ASTM D36: Greater than 325 degrees F (160 degrees C).
12. Deflection Temperature, ASTM D648: below minus 60 degrees (minus 50 degrees C).
13. Service Temperature: minus 60 degrees F to 220 degrees F (minus 50 degrees C to 105 degrees C).
14. Hardness, ASTM D2240, Shore A, 77 degrees F (25 degrees C): 60.
15. Permeability to Water Vapor, ASTM E96, Method E, 100 degrees F (38 degrees C), 100-mil sheet: 0.03 perms.
16. Abrasion Resistance, Weight Loss, ASTM D4060: 1.2 mg.
17. Adhesion to Concrete, Dry, Elcometer: 350 pounds per square inch.
18. Color: Black.

E. Reinforcing Fabric and Joint Cover Sheet: CIM Scrim. Stitch bonded polyester. Compatible with coating materials.
   1. Weight: 3 ounces per square yard (100 g/m²).
   2. Tensile Strength, ASTM D1682: 57.1 pounds (30 kg).
   3. Elongation, ASTM D1682: 61.65 percent.
   4. Mullen Burst Strength, ASTM D3726: 176.8 pounds per square inch (1,215 kPa).
   5. Trapezoid Tear Strength, ASTM D1117: 16.1 pounds (7.2 kg).

PART 3 EXECUTION

3.1 INSPECT

A. Inspect substrate and adjacent areas where high-performance coating will be applied. Notify the Engineer of conditions that would adversely affect the application or subsequent utilization of the high-performance coating. Do not proceed with application until unsatisfactory conditions are corrected.

3.2 PROTECTION

A. Protect adjacent work and surrounding areas from contact with high-performance coating.

3.3 SURFACE PREPARATION FOR WET WELL

A. Prepare surface in accordance with manufacturer's instructions.

B. Provide clean, dry, and structurally sound concrete surface. All surface of the structure shall be cleaned with a high pressure water het sprayer with an operating pressure of at least 3,500 psi. Pressure washes the structure to remove all dirt, grease, sand, and surface contaminants on the wall and floor leaving a clean damp surface.

C. New Concrete:
   1. Ensure concrete has a minimum compressive strength of 3,000 psi, is dry, and is free of release agents and curing compounds before application of high-performance coating.
   2. Remove surface laitance and expose the underlying aggregate consistent with ICRI CSP 4 to 6 in accordance with ICRI 03732.

D. Abrasive Blasting:
   1. Prepare concrete surface to receive high-performance coating by abrasive blasting.
   2. Remove dirt, soil, grease, oil, paint, coatings, form release agents, curing compounds, laitance, loose material, unsound concrete, and other foreign materials that would inhibit performance of high-performance coating in accordance with ASTM D4258 and by abrasive blasting.
   3. Obtain a firm, sound concrete surface in which bug holes are fully opened or repaired.
   4. Remove sharp concrete edges and projections.
   5. Perform abrasive blasting in accordance with ASTM D4259-88.
   6. Receive approval by Engineer of blasting media.
   7. Maintain air supply for abrasive blasting free of oil and water in accordance with ASTM D4285.
   8. Expose aggregate to obtain a profile of ICRI CSP 4 to 6 in accordance with ICRI 03732.

E. Repair concrete surface to be free of holes. Fully open bug holes before repair. Repair defects in the concrete surface, such as bug holes, air pockets, and honeycomb by filling and smoothing off with patching material, epoxy patching compound, or grout. Abrasive blast repaired surfaces.

F. Ensure substrate is clean and dry in accordance with manufacturer's instructions. Remove surface laitance from concrete surface to expose aggregate to obtain a profile of ICRI CSP 4 to 6 in accordance with ICRI 03732.

G. Repair cracks in concrete surface with material suitable for type and width of crack, compatible with substrate and high-performance coating, and approved by the Engineer.

H. The interior wall surface shall be air-dried. The relative humidity of the wall surfaces shall be less than 100% of the ambient environment. The structure may not show damp surfaces prior to the application of the lining.

I. Moisture Tests: Do not apply primer or high-performance coating to concrete surface unless two or more of the flowing moisture tests confirm appropriate moisture levels for properly prepared substrates:
   1. Plastic Sheet Method (ASTM D4263): Pass/Fail.
   2. Relative Humidity Test: Less than 75 percent relative humidity at 70 degrees F.
   3. Calcium Chloride Test: Less than 5 pounds per 1,000 square feet per 24 hours.
   4. Radio Frequency Test: Less than 5 percent moisture.

3.6 APPLICATION

A. Apply primer to concrete surface a minimum of 5-mils wet thickness. A Uniform coating free of holidays or pinholes is necessary to minimize outgassing effects curing the application of the high-performance coating to porous surfaces such as concrete. Surfaces may require additional coats to obtain a pinhole free finish.

B. Allow primer to cure in accordance with manufacturer's instructions before top coating with the high-performance coating.

C. Apply high-performance coating in accordance with manufacturer's instructions.

D. Keep material containers tightly closed until ready for use.

E. Keep equipment, air supplies, and application surfaces dry.

F. Mix and apply when high-performance coating is above 60 degrees F (15 degrees C).

G. Do not use adulterants, thinners, or cutback solutions.

H. Blend and mix 2-component materials in accordance with manufacturer's instructions. Do not thin. Do not hands mix components

I. Maintain air supply for material spray application free of oil and water in accordance with ASTM D4285.

J. Apply high-performance coating directly to a clean and dry surface or to reinforcing fabric. Vertical surfaces will require multiple coats.

K. Apply a 6 to 12-inch wide strip of joint cover sheet over cracks over 1/8-inch wide, non-working joints, and edges. Adhere center joint cover sheet over all joints by applying a tack coat of the high-performance coating.

L. Apply sufficient high-performance coating to achieve 60-mils wet film thickness for containment of wastewater.

M. Joint Lines:
   1. Prepare for joint lines should rain or other conditions require work stoppage or extended delay.
   2. Install joint lines clean and straight. Install overlap 6-inches minimum to ensure an impervious joint.

3. Severely abrade with wire brush or sandpaper and apply bonding agent to all areas where the high-performance coating has cured beyond its recoat window.

N. Recoating:
1. Recoat the high-performance coating system within the recoat window to obtain maximum interlayer adhesion to build specific thickness.
2. Immersion Service: Minimize areas to be recoated outside the recoat window, except at joint lines.
3. Non-Immersion Service: Severely abrade with wire brush or surface grinder, apply bonding agent, and recoat, if high-performance coating has cured more than the recoat window. Acceptable adhesion can only be achieved through aggressive abrading.

3.7 CURING

A. Cure high-performance coating in accordance with manufacturer's instructions.

B. Curing Time:
1. Allow sufficient time for solvents to evaporate from the cured high-performance coating before placing into service.
2. Allow minimum solvent release time of 24-hours to 48-hours at 60 degrees F (15 degrees C) for a 60-wet mil coating thickness.

C. Receive approval of cured coating by Engineer.

3.8 FIELD QUALTIY CONTROL

A. Provide inspection services by an independent inspection firm throughout all phases of surface preparation, application, and curing of the high-performance coating.

3.9 CLEANING

A. Remove and dispose of all temporary materials used to protect adjacent work and surrounding areas.

B. Immediately remove and clean high-performance coating materials from surfaces not intended to receive the materials.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

CIM 1000 Urethane Coating will not be measured separately for payment.

Full compensation for CIM 1000 Urethane Coating shall be considered to be included in the various contract item of work for which there is a bid item (manhole, new and existing wetwell) and no separate payment will be made therefore.

END OF SECTION 00 2300

SECTION 00 2400 - CONCRETE, GROUT, AND PRECAST STRUCTURES

PART 1 GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all materials for concrete and grout work in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete and grout in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1, General Requirements

B. Section 00 1600, Earthwork and Excavation

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

ACI 304R	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 347R	Guide to Formwork for Concrete
ASTM A185	Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
ASTM A615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C33	Concrete Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C143	Slump of Portland Cement Concrete
ASTM C150	Portland Cement
ASTM C309	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM D994	Preformed Expansion Joint Filler for Concrete (Bituminous Type)

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the

margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that material to be used comply with information specified herein.

C. Mix Designs. Prior to beginning the Work, the CONTRACTOR shall submit to the ENGINEER, for review, preliminary concrete mix designs which shall show the proportions and graduations of all materials proposed for each class and type of concrete specified. The mix designs shall be designed by an independent testing laboratory acceptable to the ENGINEER. All costs related to such mix design shall be borne by the CONTRACTOR. This Specification sets the minimum requirements for mix design that meets all requirements specified herein.

D. Certificate of Compliance. Certificates of compliance shall be provided for all products and materials proposed to be used under this section.

E. Delivery Tickets. The CONTRACTOR shall provide delivery tickets at the time of delivery of each load of concrete. Each delivery ticket shall be accompanied by batch tickets automatically produced by the batching equipment, indicating quantities of each ingredient. Each delivery ticket shall, in addition, state the mix number, total yield in cubic yards, date and time of day, to the nearest minute, corresponding to when the batch was loaded, when it was dispatched, when it arrived at the job, and the time that unloading began.

1.5 CONSTRUCTION TOLERANCES

A. The CONTRACTOR shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed WORK is within the tolerances shown on the Drawing and as specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Permissible deviations for cast-in-place concrete structures shall not exceed ± ¼-inch.

PART 2 PRODUCTS

2.1 GENERAL

A. Unless otherwise specified concrete shall conform to Caltrans Standard Specifications Sections 40 and 90, and have a minimum 28-day compressive strength of 4,500 psi, a maximum aggregate size of 1.0 inch, a minimum of six sacks of cement per cubic yard, and a maximum water to cement ratio of 0.45 by weight.

B. Concrete used for curb, gutters, sidewalks, and thrust blocks shall have a minimum 28-day compressive strength of 3,000 psi, a maximum aggregate size of 3/4 inches, a minimum of five sacks of cement per cubic yard, and a maximum water to cement ratio of 0.50 by weight.

C. All concrete shall have an air entrainment of 4.0 ±1.0 percent.

D. Grout types shall be as indicated in the Contract Documents.

E. Lean concrete shall have a minimum 28-day compressive strength of 2,000 psi, a maximum aggregate of 3/4 inches, a minimum of 4 sacks of cement per cubic yard, and a maximum water to cement ratio of 0.60 by weight.

F. Concrete slurry backfill shall be a minimum of one sack of cement per cubic yard, per the Plans.

2.2 FORMS

A. Concrete forms shall be metal, wood, plywood, or other approved material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade indicated. Metal forms shall be an approved type that will accomplish such results.

B. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork.

C. Lumber shall be Douglas Fir or Southern Pine, construction grade or better.

2.3 REINFORCEMENT STEEL

A. Reinforcement steel shall be deformed bars conforming to ASTM A615 Grade 60 or ASTM A706. Welded wire fabric shall conform to latest edition of CRSI Manual of Standard Practice.

2.4 CONCRETE MATERIALS

A. Cement: Portland cements Type II conforming to ASTM C150. One brand of cement shall be used throughout the project.

B. Water: Clean and free from oil, acid, alkali, organic matter, or other deleterious substances and shall contain no more than 50 ppm chlorides as Cl- no more than 50 ppm sulfates as SO4-2.

C. Aggregates:
1. Natural aggregates shall be free from deleterious coatings, conforming to ASTM C33, together with all referenced ASTM Standard Specifications, except as modified herein. Aggregates shall not be potentially reactive as defined in Appendix XI of ASTM C33. Aggregates shall be thoroughly and uniformly washed before use.
2. Fine aggregates shall conform to ASTM C33. Materials finer than the 200 sieve shall not exceed 4 percent. Use only clean, sharp, natural sand.
3. Coarse aggregate shall be: 1) natural gravels, 2) a combination of gravels and crushed gravels, 3) crushed stone, or 4) a combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension). Materials finer than the 200 sieve shall not exceed 0.5 percent.

D. Ready-Mixed Concrete: Ready-mixed concrete shall conform to the requirements of ASTM C94.

2.5 CURING COMPOUND

A. Liquid membrane-forming curing compound shall be clear or translucent, suitable for spray application and shall conform to ASTM C309, Type 1.

2.6 EXPANSION JOINT FILLER

A. Expansion joint filler shall be 1/2-inch thick, asphalt-impregnated, expansion joint material, conforming to ASTM D994.

2.7 GROUTS

A. Epoxy Grout. Epoxy grout for bonding reinforcing bars to existing concrete structures shall be manufactured by, or approved equal:
   1. Adhesive Engineering, Concresive No. 1001
   2. Sika Chemical Corp., Sikastix 350, 370, or 390, as applicable

B. Ordinary Type Grout (Dry Pack). One part Portland cement to 2 parts fine sand. Add sufficient water to form a damp formable consistency.

C. Non-Shrink Grout. Non-shrink grout shall be nonmetallic, nonages-liberating type, as manufactured by, or approved equal:
   1. Master Builders, Master Flow 713
   2. UPCO Company, UPCON, High Flow

D. Cement Grout. Cement grout shall be composed of one part cement, two parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.

2.8 BONDING AGENT

A. Bonding agent shall be manufactured by, or approved equal:
   1. W. R. Grace and Company, Cambridge, MA
   2. Sika Chemical Corp., Lyndhurst, NJ
   3. Adhesive Engineering Company, San Carlos, CA

B. Product shall be recommended by manufacturer as suitable to meet job requirements with regard to surface, pot life, set time, vertical or horizontal application, forming restrictions, etc. Furnish manufacturer's specific instructions for this job application, and obtain ENGINEER's approval prior to application.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavation, backfill and compaction shall be in accordance with Section 00 1600, Earthwork.

3.2 FORMS

A. Construct all form work in accordance with ACI 347. Before placing the concrete, the contact surfaces of forms shall be coated with a suitable non-staining form coating

compound or shall be given two coats of nitro-cellulose lacquer. All excess coating shall be removed by wiping with cloths.

3.3 REINFORCEMENT

A. All reinforcement shall be provided as indicated together with all necessary ties, spacers, supports, and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from loose rust, scale, oil, grease, and other coatings and foreign substances that would reduce or destroy the bond.

3.4 MIXING

A. Concrete mixing shall conform to ACI 304, current edition, and to the other requirements specified herein.

B. Concrete shall be discharged at the job within 1-1/2 hours after the water has been added to the cement and aggregates mixture. Concrete may be machine mixed at the job site or ready mixed at the CONTRACTOR's option, and shall conform to the following requirements:

1. Site Mixing: Concrete produced at the site shall be mixed in a batch mixer with a capacity of not less than 1/2 cy. The minimum mixing time for each batch (from the time when all solid materials and water are in the drum) shall be 1-1/2 minutes for mixers of 1 cy capacity or less; for mixers of larger capacity, the mixing time shall be increased 30 seconds for each additional 1/2 cy or fraction thereof. The mixer shall revolve at a uniform peripheral speed of about 200 rpm. The entire batch shall be discharged before the mixer is recharged.
2. Ready Mixed Concrete: All concrete constituents for ready mixed concrete shall be batched at the central plant. All central plant and rolling stock equipment and methods shall conform to the requirements of ASTM C94, as applicable.

3.5 EMBEDDED ITEMS

A. All reinforcement, anchor bolts, sleeves, inserts and similar items shall be set and secured in the forms where shown on the Drawings or by shop drawings and shall be acceptable to the ENGINEER before any concrete is place. Accuracy of placement is the responsibility of the CONTRACTOR.

B. Anchor bolts shall be accurately set and shall be maintained in position by templates while being embedded in concrete.

3.6 PLACING

A. No concrete shall be placed after there is evidence of initial set. Concrete placement will not be permitted when weather conditions prevent proper placement and consolidation. Consolidation of concrete shall be with internal concrete vibrators supplemented by hand-spading, rodding, and tamping. Vibrating equipment shall be adequate to thoroughly compact the concrete. Concrete shall be compacted, screeded to grade, and prepared for the specified finish.

3.7 CURING

A. Curing shall begin as soon as free water has disappeared from concrete surfaces after placing and finishing. Curing materials shall be applied and maintained so as to protect the concrete from moisture loss. Water used in curing shall be potable. Curing shall be accomplished by moist curing method. Unformed surfaces shall be covered with absorptive materials wetted before placing. Absorptive materials or forms used in curing shall be kept continually wet.

3.8 FIELD SAMPLING AND TESTS

A. The CONTRACTOR shall be responsible for the quality of the materials and workmanship of the placement of the concrete. Sampling, preparation of test specimens, and testing will be the Contractor's responsibility.

3.9 SLUMP

A. Concrete consistency shall be determined by slump tests in accordance with ASTM C143. At least one test shall be made at the commencement of the concrete placement and at the time standard test cylinders are molded.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Concrete pad and PCC dike will be measured for payment as a lump sum bid item.

B. Precast concrete vaults and boxes will be measured for payment per each of various types listed in the bid schedule.

4.2 PAYMENT

A. The contract lump sum price paid for concrete pad and pcc dike shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved including reinforcement, drill and bond dowels per plans, complete and in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

B. The contract unit price paid for various boxes and vaults per each shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved including cover as specified herein and per plans, complete and in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 2400

SECTION 00 2500 - SUBMERSIBLE PUMPS AND EQUIPMENT

PART 1 GENERAL

1.1 THE REQUIREMENT

A. CONTRACTOR shall furnish and install two (2) new submersible pumps. CONTRACTOR to provide discharge base elbows, guide bar assemblies, shackles and chains for pulling pumps, and accessories at the Pump Station. Pumps shall be complete and operable in accordance with the requirements of this specification.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 2100 Sanitary Sewage Manhole and Wet Well

1.3 ENVIRONMENTAL CONDITIONS

A. The equipment furnished under this Section will be installed in wastewater lift stations located at sea level. Temperatures are expected to range between 0 degrees C and 40 degrees C with relative humidity varying from 30 to 100 percent (condensing).

1.4 QUALITY ASSURANCE

A. Equipment provided under this Section shall be end products of one manufacturer in order to achieve standardization for operation, maintenance, spare parts and manufacturer's service.

B. The pumps shall be capable of operating continuously at the specified operating conditions without cavitation or damaging vibration, as tested in accordance with the American Hydraulic Institute standards for testing.

1.5 CONTRACTOR SUBMITTALS

A. Submittals shall be in accordance with Division 1.

B. A copy of this specification sections, with any addendum updates included, and all referenced and applicable sections, with any addendum updates includes, shall be submitted with each paragraph check-marked to indicate specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justifications(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with not further consideration.

C. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

D. The following information shall be included in the submittal. Submittals shall show compliance with Contract Documents:

1. Dimensional drawings of the base elbow assemblies and guide rails. Provide a material specification list describing materials used in the manufacturer of the pump and base elbow.

E. Submit installation guides prior to installing equipment.

1.6 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Not Used.

1.7 SHIPMENT AND DELIVERY

A. Prepare and load all material and articles for shipment in a manner that shall protect the equipment from damage in transit, shall include a packing list, and shall be responsible for and make good any and all damage. During shipping the rotating elements shall be suitably supported to protect bearings.

B. All accessories and spare parts shall be packed separately in containers plainly marked "ACCESSORIES ONLY" or "SPARE PARTS ONLY". All packing materials shall be fire retardant. A packing list listing the contents of each container shall be placed in a moisture-proof envelope and securely fastened to the outside of the container.

1.8 EXPERIENCE

A. Not Used.

1.9 UNIT RESPONSIBILITY

A. The manufacturer of the pump shall have unit responsibility for the complete motor and pump.

PART 2 PRODUCTS

2.1 SUPPLIER

A. The manufacturer’s model numbers listed on the DRAWINGS. Any modifications required to meet these specifications shall be made to the manufacturer’s standard product.

2.2 PUMPS

A. Two (2) Flygt submersible pumps and motor cables

2.3 SUBMERSIBLE PUMP DESIGN AND MATERIALS OF CONSTRUCTION

A. CONTRACTOR shall provide discharge elbows for permanent installation in the wet well. The pumps shall automatically connect to the discharge connection elbow when lowered into place. Pumps shall be easily removable for inspection or service, requiring no bolts, nuts or other fastenings to be removed for the purpose and no need for personnel to enter the wet well. Sealing of the pumping unit to the discharge elbow shall be accomplished by a simple linear downward motion of the pumps with the entire weight of the pumping units guided to and pressed tightly against the discharge elbow with a metal-to-metal watertight contact. Sealing of the discharge interface by means of a diaphragm, O-ring, or other device will not be acceptable. No

portion of the pump shall bear directly on the floor of the sump. Guide bars, which shall steer the pump into proper contact with the discharge elbow, shall be non-adjustable and shall not bear the weight of the pump.

2.4 GUIDE BARS AND BRACKETS

A. Two guide bars shall be provided by the CONTRACTOR for each pump raising and lowering the pumping units. The guide bars shall not support any portion of the weight of the pump. Guide bars shall be of the diameter and length recommended by the pump manufacturer for proper installation. Guide bars shall be Type 316 Stainless steel, and shall be suitable for guiding new pumps. Single guide bars or guide rope is not acceptable. All components of the guide bar system except actual guide bars shall be provided under this specification. The lower guide bar holders shall be integral with the discharge elbow. The upper guide bracket shall be furnished to support and align the rails at the top of the wet well. Intermediate support brackets shall be provided as necessary to eliminate deflection of the guide bars. Connection to the walkway platform shall be coordinated by the CONTRACTOR.

B. The pump unit shall be guided on the bars by a guide bracket that shall be an integral part of the pump. Upper guide bar brackets, safety hooks, and cable holder shall be fabricated from Type 316 stainless steel.

2.5 LIFTING CHAINS AND FITTINGS

A. Each pump shall be fitted with a sufficient length of Type 316 stainless steel lifting chain capable of lifting the pump and motor. The necessary fittings shall be Type 316 stainless steel. Cable is not an acceptable substitute. Provide two Type 316 stainless steel shackles per pump.

2.6 MIX-FLUSH VALVE

A. The mix-flush valves shall be mounted directly on the pump volutes to direct part of the pumped discharge to flush solids into suspension at the start of each pumping cycle. The valves shall be positioned on the pump volutes to provide a non-clogging flow operation. The pump volutes shall have a special mounting flange to allow for the proper flow exit angle and to strengthen the volute wall in order to withstand the shock loads imposed by the valves. The valves and the volute locations are specific to certain pump models. Two mix-flush valves shall be placed at each duplex pump station. The valve manufacturer and the pump manufacturer must both certify the use of the valves on the pumps being used. Each manufacturer must include a written warranty certifying the use of the valves on the pumps. The pumps shall have a cast boss on their volute machined to accept the valves.

B. The valve shall be open at the beginning of each pumping cycle and close under full pump discharge pressure after a pre-selected time. The valve shall be operated by the liquid being pumped through a self-contained hydraulic system. No external power source should be required to operate the valve. The valve shall be controlled by hydraulic pressure from the pump, external electrical, hydraulic or pneumatic lines shall not be allowed. A means of adjustment should be provided to achieve a 30 second flushing period for different head and flow conditions.

C. Mix-flush valve shall have a cast-iron body containing a cast-iron or polyurethane ball. The valve shall be fully automatic operating entirely on the pressure in the pump. It shall have no electrical components or cables. The membrane under the

ball shall be nitrile rubber with rape seed oil that regulates the length of flushing.

D. Mix-flush valve shall be manufactured by, or approved equal:
   1. Flygt, Flush Valve, sized to fit pump (coordinate with the Town)

PART 3 EXECUTION

3.1 MANUFACTURER'S SERVICES

A. The CONTRACTOR is responsible for obtaining manufacturer's services required to perform the WORK and services specified herein. No additional compensation will be provided for these services.

3.2 INSTALLATION

A. Pumps shall be installed in accordance with the manufacturer's recommendations. Install pump with proper clearance between the bottom of the pump and the floor, per manufacturer’s recommendations. Factory trained personnel shall inspect the installation and provide start-up services. The manufacturer shall state in writing that the installation is in accordance with the manufacturer's recommendation. CONTRACTOR shall obtain manufacturer's services as stated herein.

B. CONTRACTOR shall furnish and install two (2) submersible pumps and motor cables including discharge base elbows, guide bar assemblies, and accessories as shown on the plans. Pumps shall be complete and operable in accordance with the requirements of this specification.

3.3 MIX-FLUSH VALVE

A. The mix-flush valves shall be installed on the pumps as shown in the Contract Documents and in accordance with the manufacturer’s instructions.

3.4 FIELD TEST

A. The CONTRACTOR and TOWN of WOODSIDE shall coordinate to field test and verify performance of each pump and motor. The CONTRACTOR shall coordinate with the Town schedule the test date.

B. The final adjustments and inspections shall be made by factory-trained and authorized service personnel other than sales representatives, who also shall inspect the installation and test operation. CONTRACTOR shall include in bid, allowance for factory-trained service personnel to adjust all of the said equipment to be installed by CONTRACTOR until this equipment has been tested by the CONTRACTOR and the results of these tests are satisfactory to the ENGINEER or his/her designated representative.

C. Prior to field test, CONTRACTOR shall submit for review and approval a copy of the proposed field test procedure.

D. The tests shall demonstrate that the equipment has been properly installed, aligned and connected, is free of mechanical defects, electrical defects, excessive vibration, and that the control system performs as specified and meets all operating criteria. The ENGINEER or his/her designated representative shall be present during testing. All parts shall operate satisfactorily in all respects and in accordance with the specified requirements for the full duration of the test period. If any part of a unit

shows evidence of unsatisfactory or improper operation during the test period, correction or repairs shall be made by the CONTRACTOR and the full operational test shall be redone for that unit after all parts operate satisfactorily.

3.5 FINAL TEST (FUNCTIONAL ACCEPTANCE TEST)

A. A field functional acceptance test shall be made of the entire pumping system, including instruments, controls, alarms, control strategy, motors, new pumps, and valves, to ensure compliance with the performance specified herein.

B. The pumping station shall operate as described under the control strategy outlined in the instrumentation specification.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Pump installation and testing will be measured for payment as a lump sum bid item.

4.2 PAYMENT

A. The contract lump sum price paid for pump installation and testing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved including reinforcement, guiderails, all mounting hardware required for the installation of pumps, electrical and communication hookup, drill and bond dowels per plans and testing, complete and in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 2500

SECTION 00 2600 - PIPING, GENERAL

PART 1 GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install all piping systems in accordance with the requirements of the Contract Documents. Each system shall be complete with all necessary fittings, hangers, supports, anchors, expansion joints, flexible connectors, valves, accessories, lining and coating, testing, excavation, and backfill, to provide a functional installation.

B. No tie-ins to the existing system shall be made or existing flow diverted into the new pipeline until the CONTRACTOR has an approved tie-in plan.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 1600, Earthwork and Excavation

B. Section 00 2700, Ductile Iron Pipe

C. Section 00 2800, Polyvinyl Chloride (PVC) Pipe

D. Section 00 2900, Valves, General

E. Section 00 3000, Check Valves

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. This Section contains references to the following documents. In case of a conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail. The latest edition of the following references at the time of bid shall be used:

ANSI/AWS D1.1	Structural Welding Code
AWWA M11	Steel Pipe Design and Installation Manual
MSS SP	Pipe Hangers and Supports-Materials, Design and Manufacture
ASTM D1784	Rigid PVC Compounds and Chlorinated PVC Compounds
ASTM D1785	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2464	Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

ASTM D2466	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2564	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM D2774	Underground Installation of Thermoplastic Pressure Piping
ASTM D3034	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3139	Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals
ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F402	Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F656	Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM F679	Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F913	Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In.
ASTM F68	Copper Tubing and hose bibs

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. The CONTRACTOR shall submit complete shop drawings and certificates, test reports, and affidavits of compliance, for all piping systems as specified in the individual piping sections. The shop drawings shall include all necessary dimensions and details on pipe joints, fittings, fitting specials, valves, appurtenances, design calculations, and material lists.

C. The CONTRACTOR shall submit double-line drawings of each piping support system, locating each support and hanger, including seismic bracing, identifying the type of catalog number or shop drawing detail number, and showing anchor locations and identifying them by shop drawing detail number.

D. The CONTRACTOR shall submit as part of the shop drawings a statement from the pipe fabricator certifying that all pipes will be fabricated subject to a recognized Quality Control Program. An outline of the program shall be submitted to the ENGINEER for review prior to the fabrication of any pipe.

E. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

F. The CONTRACTOR shall furnish the manufacturer's instructions for installation of equipment.

G. Certification of all materials, properly executed by the manufacturer, shall be available to show compliance with the Specification for materials being furnished.

H. The CONTRACTOR shall provide details of procedures and the schedule to be used for hydrostatic testing of installed pipelines.

1.5 QUALITY ASSURANCE

A. General. To assure uniformity and compatibility of piping components in grooved-end piping systems, fittings, and couplings shall be furnished by the same manufacturer. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance and manufacturer's service.

B. Inspection.

1. All pipe shall be subject to inspection at the place of manufacture. During the manufacture of the pipe, the ENGINEER shall be given access to all areas where manufacturing is in progress and shall be permitted to make all inspections necessary to confirm compliance with the Specifications.
2. The CONTRACTOR shall notify the ENGINEER of the production schedule in sufficient time so that factory inspection can be arranged. Factory inspection will be made after the manufacturer has performed satisfactory checks, adjustments, tests, and operations. The extent of factory inspection and testing shall be as specified herein below and in the respective piping sections of these Specifications.
3. The manufacturer shall make available for the ENGINEER's use such gauges as are necessary for inspection. The manufacturer shall provide the ENGINEER with such assistance as is necessary for the handling of pipe and fittings.
4. Approval of pipe at the factory only allows the manufacturer to ship the equipment to the site, and does not constitute final acceptance by the ENGINEER. Unless otherwise specified, the TOWN will pay for expenses incurred for the factory test witness visits. The cost of performing the tests in the factory shall be included in the CONTRACTOR's bid.

C. Tests. Except where otherwise specified, all materials used in the manufacture of the pipe shall be tested in accordance with the applicable Specifications and Standards. Welds shall be tested as specified. The CONTRACTOR shall perform all tests at no additional cost to the TOWN.

D. Welding Requirements. All welding procedures used to fabricate pipe shall be prequalified under the provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or spiral welds for pipe cylinders, reinforcing plates and ring flange welds, and plates for lug connections.

E. Welder Qualifications. All welding shall be done by skilled welders, welding operators, and tackers who have had adequate experience in the methods and materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent, local, approved testing agency not more than 6 months prior to commencing work on the pipe. Machines and electrodes similar to those used in the Work shall be used in qualification tests. The CONTRACTOR shall furnish all material and bear the expense of qualifying welders.

1.6 MANUFACTURER'S SERVICE REPRESENTATIVE

A. Where the assistance of a manufacturer's service representative is advisable, in order to obtain proper pipe joints, supports, or special connections, the CONTRACTOR shall furnish such assistance at no additional cost to the TOWN.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery at Site. All materials that will not be installed the same day as delivered to the site shall be stored in the original manufacturer's packaging. Loose items with no original packaging shall be boxed to protect the products from scratches, abrasion, or breakage.

B. Protection Prior to Installation.

1. All products shall be protected from excessive heat and from moisture during storage and handling.
2. All plastic materials shall be stored out of direct sunlight.
3. Store pipe and fittings on suitable supports to prevent damage, rolling, and contamination from dirt. Protect all machined surfaces exposed during shipment and storage from weather and dirt by bolting on plywood covers and covering with membrane covers. Protect all exposed gaskets from weather and dirt with membrane covers. Loose gaskets shall be properly stored in boxes to prevent them from damage and the sun.
4. Bedding materials may be stockpiled on the jobsite or may be arranged to be delivered as the need occurs. Project schedule shall not be impeded due to insufficient materials on the jobsite.
5. Damaged and unprotected or improperly stored materials will not be accepted for payment as materials on hand.

1.8 JOB CONDITIONS

A. Tools, Supplies, and Services. Provide needed tools, supplies, and services to handle materials and accomplish work.

B. Scheduling. Coordinate the extent of work and available labor force so that the Work undertaken can be made safe by the end of the Workday and before the arrival of adverse weather.

C. Safety. Provide and maintain at all times, signs, flag persons, barricades, warning lights, ladders, railings, and other safety items needed to protect the personnel and work.

1.9 CLEANUP

A. After completion of the Work, all remaining pipe cuttings, joining and wrapping materials, and other scattered debris, shall be removed from the site. The entire piping system shall be handed over in a clean and functional condition.

PART 2 -- PRODUCTS

2.1 GENERAL

A. All pipes, fittings, and appurtenances shall be furnished in accordance with the Plans, and as specified herein.

B. Pressure Rating. All piping systems shall be designed for the maximum expected pressure as shown on the piping schedule.

2.2 PIPING SCHEDULE

A. CONTRACTOR shall field verify existing pipe and joint type for existing pipes to be connected to.

B. Where joint type specifically shown on Drawings, then that joint type shall be used.

C. Piping systems to be installed under this Contract, include the following:

Abbreviation	Use	Piping	Fittings/Joints[A]	Test Pressure[B]
AR	Air Release (new)	Buried: PVC, Sch 80	Same as pipe/ solvent weld	85 psi
		Exposed: PVC, Sch 80	Same as pipe/ solvent weld	85 psi
D	Drain (new)	Buried: PVC, Sch 80	Same as pipe/ solvent weld	5 psi
EBD	Emergency Bypass Discharge (new)	Exposed: Ductile iron, Class 53, CML, amine cured epoxy coated	Same as pipe/ flanged	85 psi
PD	Pump Discharge (new)	Exposed: Ductile iron, Class 53, CML and amine cured epoxy coated within wet well and vaults	Same as pipe/ flanged	85 psi
		Buried: Ductile iron, Class 52, CML and asphaltic coated & polywrapped	Same as pipe/ flanged	85 psi
SS	Sanitary Sewer (existing)	Buried: Vitrified Clay	Same as pipe/ field verify	N/A
	Sanitary Sewer (new)	Buried: PVC, ASTM F679 SDR 26	Same as pipe/ push-on bell and spigot	See Spec. 15064

SSFM	Forcemain (new PVC)	Buried: PVC C900	Same as pipe/ solvent weld	85 psi
	Forcemain (new DIP)	Exposed: Ductile iron, Class 53, CML and amine cured epoxy coated within flowmeter vault	Same as pipe/ flanged	85 psi
		Buried: Ductile iron, Class 52, CML and asphaltic coated & polywrapped	Same as pipe/ flanged	85 psi

A. Joints shall be as shown in the pipe schedule, unless specifically shown otherwise on drawing or specified in Specifications.

B. All piping shall be tested with water as the test medium, except for SS which shall be tested with air.

2.3 SLEEVE-TYPE FLEXIBLE COUPLINGS

A. Construction. Sleeve-type flexible couplings shall be provided where shown on the Contract Documents. Sleeve-type flexible couplings shall be of steel, without pipe stop, and shall be of sizes to fit the pipe and fittings shown. The middle ring shall be not less than 1/4-inch in thickness and shall be a minimum of 7 inches long. The followers shall be single-piece contoured mill section welded and cold expanded as required for the middle rings. They shall be of sufficient strength to accommodate the number of bolts necessary to obtain adequate gasket pressures without excessive rolling. The shape of the follower shall be of such design as to provide positive confinement of the gasket. Sleeve-type flexible couplings shall be manufactured by, or approved equal:
1. Dresser, Style 38 or 138
2. Smith-Blair, Style 411

B. Pipe Preparation. The ends of the pipe, where specified or shown, shall be prepared for flexible steel couplings. Plain ends for use with couplings shall be smooth and round for a distance of 12 inches from the ends of the pipe, with outside diameter not more than 1/64-inch smaller than the nominal outside diameter of the pipe. The middle ring shall be tested by cold-expanding a minimum of one percent beyond the yield point, to proof-test the weld to the strength of the parent metal. The weld of the middle ring shall be subjected to air test for porosity.

C. Gaskets. Gaskets for sleeve-type couplings shall be rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions. The gaskets shall be immune to attack by impurities normally found in water, wastewater, and wet well ventilation air, and shall be suitable for use with temperatures at 180 degrees F. All gaskets shall meet the requirements of ASTM D2000, AA709Z, meeting Suffix B13 Grade 3, except as noted above.

D. Buried couplings shall include stainless steel nuts, bolts, washers, and tie rods.

E. Sleeve-type couplings shall be sized for specific pipe material indicated in pipe schedule.

F. Reducing and/or transition couplings shall be used to join new pipe to existing pipe

where shown on the Drawings. CONTRACTOR shall field verify existing pipe dimensions prior to ordering materials.

G. Where cement mortar coated pipe is to be provided with couplings, cement mortar coatings shall be left back for coupling. Pipe shall be coated with amine-cured epoxy at location of coupling and cement mortar coating intersection. Pipe lining shall be repaired due to welding of tie rods to piping.

2.4 FLANGE COUPLING ADAPTERS

A. Flange adapters shall be fabricated from high strength steel. Flanges shall be supplied to AWWA C207 as well as all ANSI standards. Compression ends shall have wedge gasket for efficient sealing. Gasket material shall be suitable for raw wastewater. All miscellaneous metalwork items shall be Type 316 stainless steel.

B. Pipe ends shall be properly prepared for accepting the flange adapter in accordance with manufacturer’s recommendations. The outside diameter and pipe type shall be verified prior to ordering adapters. Flange adapters shall be lined and coated with fusion bonded epoxy, Protective Coatings.

C. Where cement mortar coated pipe is to be provided with couplings, cement mortar coatings shall be left back for coupling. Pipe shall be coated with amine-cured epoxy at location of coupling and cement mortar coating intersection. Pipe lining shall be repaired due to welding of tie rods to piping.

D. Flange adapters shall be manufactured by, or equal.
1. Dresser, Style 128.
2. Smith-Blair

2.5 WALL PENETRATIONS

A. All piping penetration of walls shall be as shown on the Contract Documents. It shall be the CONTRACTOR's responsibility to verify the size and location of all structure penetrations prior to making core drills. CONTRACTOR shall x-ray existing walls and slabs prior to core drilling.

2.6 PIPE MARKINGS

A. All exposed piping in valve boxes shall be provided with labels showing contents of the pipeline and flow direction. Labels shall be black text on white background. Labels shall be suitable for pipe material and temperature. Labels shall be manufactured by, or equal:
1. Brady Labels

2.7 PIPING IDENTIFICATION

A. Identification of Exposed Piping.

1. Identification of all exposed pipe shall be accomplished by color-coding and by lettering as specified in Part 3 here, and in Section 09800, Protective Coatings.
2. Each pipe identification shall consist of a printed label identifying the name of the pipe contents and a flow arrow to indicate direction of flow in the pipe. All labels shall be preprinted on pressure-sensitive adhesive-backed vinyl cloth or plastic tape. Arrows shall be die-cut of the same type of material as the labels.

3. Letter sizes and colors for lettering, arrows, and a background shall conform to ANSI A13.1.
4. Preprinted identification devices shall be as manufactured by W. H. Brady Co., Seton Nameplate Corp., or equal.

B. Identification of Valves and Short Pipe Lengths.

1. Identifying devices for valves and the sections of pipe that are too short to be identified as indicated shall be identified with metal or plastic tags as specified herein.
2. Metal tags shall be of stainless steel with embossed lettering. Plastic tags shall be of solid black plastic laminate with white embossed letters. All tags shall be designed to be firmly attached to the valves or short pipes or to the structure immediately adjacent to such valves or short pipes.

2.8 PIPE FLANGES

A. Flanges. Flanges shall conform to either ANSI/AWWA C207 Class D or ANSI B16.5 150-lb. class. Where the design pressure is greater than 150 psi, up to a maximum of 275 psi, flanges shall conform to either ANSI/AWWA C207 Class E, Class F, or ANSI B16.5 150-lb. class. Flanges shall have flat faces and shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise shown. Attachment of the flanges to the pipe shall conform to the applicable requirements of ANSI/AWWA C207. Flanges for miscellaneous small pipes shall be in accordance with the standards specified for these pipes.

B. Blind flanges. Blind flanges shall be in accordance with ANSI/AWWA C207, or with the standards for miscellaneous small pipes.

C. Flange coating. All machined faces of metal blind flanges and pipe flanges shall be coated with a temporary rust-inhibitive coating to protect the metal until the installation is completed.

D. Flange bolts. Studs and bolts shall extend through the nuts a minimum of 1/4-inch. All bolts and nuts shall be Type 316 stainless steel.

E. Flange gaskets. Gaskets for flanged joints shall be full-faced, 1/16-inch thick compressed sheets of aramid fiber base, with nitrile binder and non-stick coating, suitable for temperatures to 700 degrees F, a pH of one to eleven, and pressures to 1000 psig. Blind flanges shall have gaskets covering the entire inside face of the blind flange and shall be cemented to the blind flange. Ring gaskets shall not be permitted. Flange gaskets shall be suitable for service including raw wastewater.

F. Flange gasket suppliers, or approved equal:
1. John Crane, Style 2160
2. Garlock
3. Klinger

G. Flange Insulating Joints. Where shown or where existing flange insulating joints are removed, flange insulated joints shall be used to insulate the pipe. Insulating joints shall also be provided between dissimilar pipes. The insulation shall include non-conductive full-faced gaskets and sleeves and washers for the bolts. Insulating joints shall be provided for flange and plain end where required.

2.9 VALVES

A. Valves shall be the same size as the pipelines in which they are installed, unless specifically sized.

B. Install no valve with its stem pointing down, unless specifically shown on the Drawings.

2.10 PIPE SLEEVE

A. Pipe sleeves shall be provided where pipelines pass through new concrete walls that are to be watertight. The sleeves shall be non-metallic, non-corrosive, thermoplastic material and shall be formed to have a water stop and anchor plate at least 4 inches larger than the main outside diameter. The sleeves shall be as manufactured by, or equal:
   1. Link-Seal Century Line
   2. Thunderline Corporation

2.11 LINK SEALS

A. Link seals shall be as manufactured by, or equal:
   1. Thunderline Corporation

B. Seals shall be modular mechanical type, consisting of interlocking rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber bolt around the pipe.

C. Bolts and nuts shall be stainless steel.

D. Tightening the bolts shall cause the rubber sealing elements to expand and provide a watertight seal.

E. The seal shall be constructed to provide electrical insulation.

2.12 WARNING TAPE

A. Identification of SSFM piping shall be accomplished by color-coded warning tape consisting of a minimum 2-inch wide plastic tape with lettering giving a warning and a description of the pipe function (i.e., “WARNING, SEWER LINE BURIED BELOW”). For pipe diameters larger than 12 inches, the warning tape shall be a minimum of 6 inches wide. The warning tape shall be green for SSFM piping.

B. Warning tape manufacturer shall be, or approved equal:
   1. Thor Enterprises
   2. Calpico

2.13 PIPE SUPPORT SYSTEMS

A. General.
   1. Piping shall be supported to accommodate loading, expansion, and contraction.
   2. No attempt has been made to show all required pipe supports on all locations. The absence of pipe supports and details on Contract Documents shall not relieve the CONTRACTOR of the responsibility for providing them where required.
   3. Where piping connects to equipment, it shall be supported by a pipe support and not by the equipment.

4. Pipe support system components shall withstand the dead loads imposed by the weight of the pipes filled with water, plus any insulation, and shall have a minimum safety factor of 5. At each support, every pipe shall be provided with a pipe clamp or guide. The CONTRACTOR shall size and place all pipe support systems, and shall submit load calculations and pipe support design and locations to the ENGINEER for review prior to installation.
5. No punched strap, wire, or other makeshift devices will be accepted.
6. All exposed hangers, rods, clamps, protective shields, metal framing support components, and hanger accessories shall be hot dip galvanized. Submerged or potentially submerged (i.e., below grade within a structure, such as above the wet well; this does not include locations within the pump station building) components shall be Type 316 stainless steel.
7. All pipe supports shall be in accordance with the Contract Documents or as directed by the ENGINEER.

B. Vertical Pipe Supports.
1. Where exposed pipes change from horizontal to vertical, the pipes shall be supported on the horizontal runs within 2 feet of the change in direction.
2. For vertical runs exceeding 10 feet, pipes shall be supported by a base elbow.
3. All vertical pipes shall be supported at intervals of no more than 8 feet, on wall rests, and at all points necessary to ensure rigid construction.
4. All pipe supports shall be in accordance with the Contract Documents or as directed by the ENGINEER.

C. Special Supports. Any required pipe supports for which the supports specified in this Section are not applicable shall be fabricated or constructed from standard structural steel shapes, concrete, and anchor hardware similar to items previously specified herein and shall be subject to the approval of the ENGINEER.

2.14 THREADED INSULATING CONNECTIONS

A. General. Threaded insulating bushings, unions, or couplings, as appropriate, shall be used for joining threaded pipes of dissimilar metals, threaded piping from exterior to interior, and for piping systems where corrosion control and cathodic protection are involved.

B. Materials. Threaded insulating connections shall be of nylon, Teflon, poly-carbonate, polyethylene, or other non-conductive materials, and shall have ratings and properties to suit the service and loading conditions.

2.15 PIPE THREADS

A. All pipe threads shall be in accordance with ANSI/ASME B1.20.

PART 3 -- EXECUTION

3.1 GENERAL

A. All pipes, fittings, and appurtenances shall be installed in accordance with the requirements of the Contract Documents. If the CONTRACTOR desires to change any of the piping layouts shown on the Contract Documents, it shall submit to the ENGINEER, for approval, CONTRACTOR's detailed proposed layouts.

B. Any pipe that does not meet the Specifications or has been rejected shall be

removed from the jobsite and disposed of by the CONTRACTOR at no extra cost to the TOWN.

C. Where new fittings are to be cut into or attached to existing piping or where connections are to be made to existing piping, the CONTRACTOR shall furnish and install the necessary sleeves, flanges, nipples, couplings, fittings, etc. needed to accomplish the cutting-in or connections, whether specifically indicated on the Contract Documents or not.

D. Lines under low head shall be laid flat or with a continuous grade so that there will be no air traps or humps in them, except at the ends where means for venting shall be provided.

E. All pipe that will operate under pressure shall be properly blocked at all fittings where the pipeline changes direction, changes size, or ends, using concrete thrust blocks in trenches and suitable anchors in structures. The concrete shall be placed so that the pipe joints and fittings will be accessible.

F. Upon completion of installation, piping systems shall be flushed and cleaned.

G. All rigid polyvinyl chloride (PVC) pipe shall be cut square, burrs removed, made up, and installed in accordance with the pipe manufacturer's recommendations, as approved. Offset shall be as recommended by the manufacturer for the maximum temperature variation between time of solvent welding and final use.

H. Pipe shall not be laid when the temperature is below 40 degrees F, nor above 120 degrees F when exposed to direct sunlight. Ends to be joined shall be shielded from direct sunlight prior to and during the laying operation.

I. Provide adequate ventilation when working with pipe joint solvent cement.

J. Wyes shall be 8 inch by 4 inches of the same material as the main line pipe and shall have the same type gasket connections. Tees will not be allowed.

K. Bend shall be standard 4 inch, 11.25o (1/8) pipe bends. Bends and joints shall be as specified for service pipe.

L. All wyes, bends, service pipe and other appurtenances shall be provided as required for each connection. All joints shall be installed so as to provide watertight connections.

M. Wye joints shall be installed as directed, with the branch turned to the proper direction. Wyes shall be firmly supported by methods and materials used for bedding of main line pipe. Branch of wyes shall be installed at an angle 45 degree to the spring line unless grade requirement dictate otherwise.

N. Coupler band shall be stainless steel banded Mission "Arc Shield", Fernco "shear-ring" or approved equal.

3.2 EXCAVATION AND TRENCHING

A. Perform all excavations for pipelines and appurtenances, of whatever substances encountered, to the depths indicated in the Contract Documents.

3.3 INSTALLATION

A. General.

1. Each pipe and fitting shall be carefully inspected before the exposed pipe or fitting is installed or the buried pipe or fitting is lowered into the trench. The laying of all pipe shall be in finished trenches free from water or debris. The lining and protective coating shall be inspected, and all damaged areas patched in the field with material similar to the original. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.
2. Clean out fittings, valves, and pipe sections before installing.
3. Furnish and assemble pipe and fittings to provide accurate alignment for joints.
4. Make all joints watertight.
5. Use an anti-seize compound on all bolt threads. Manufacturer's instruction for application shall be followed. The anti-seize compound shall be designed to prevent rusting and seizure of bolt threads and to prevent galling of stainless steel.
6. Provide temporary plugs or bulkheads for closure of the open ends of piping whenever work is stopped.
7. Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.
8. In laying pressure pipelines, the deflection in a standard joint shall not exceed 50 percent of manufacturer's recommendation. Deflections beyond 50 percent of manufacturer’s recommendations shall require special bends or fittings. Departure from and return to established alignment and grade shall not exceed 1/6-inch per linear foot of pipe, and at no point shall the maximum departure from established line and grade be greater than 1-inch.
9. Each section of pipe shall be lowered into the trench, utilizing a sling or other device, in a manner that shall prevent injury to the pipe, coating, lining, or joints. In placing pipe in the trench, the pipe shall be held by the lowering device at the balancing point of the section. It shall not be dragged on the bottom of the trench, but shall be supported while being fitted into the adjacent section. Supporting the pipe on blocks, or blocking of any nature, either temporary or otherwise, will not be allowed.
10. It is the responsibility of the CONTRACTOR, when the pipeline and appurtenances are finally laid, to see that all joints are protected and that any damage to the coating or lining of the pipe and fittings has been adequately repaired or replaced in order to preserve their integrity for corrosion protection.
11. Repairs of defects that are discovered as a result of inspection or tests shall be made with new materials. Caulking of screwed joints, cracks, or holes will not be accepted. Tests shall be repeated after defects have been eliminated.
12. The Piping Schedule lists the pressures at which all lines shall be tested.

B. Buried Pipe.

1. Do not deviate more than 1-inch from line or 1/4-inch from grade, unless reviewed and accepted by the ENGINEER. Measure for grade at the pipe invert, not at the top of the pipe, because of permissible variation in pipe wall thickness.
2. Grade the bottom of the trench by hand to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and for bedding when specified or indicated. Remove hard spots that would prevent a

uniform thickness of bedding. Before laying each section of the pipe, check the grade with a straight edge and correct any irregularities found. The trench bed shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of lifting tackle.

3. At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides where necessary to permit easy visual inspection of the entire joint.
4. Provide and maintain ample means and devices at all times to remove and dispose of all water entering the trench during the process of pipe laying. The trench shall be kept dry until the pipe laying and jointing are completed.
5. When the pipe laying is not in progress, including the noon hours, the open ends of pipe shall be closed by approved means, and no trench water, animals, or foreign material shall be permitted to enter the pipe.
6. Minimum pipe cover in the trench shall be 3 feet unless otherwise indicated.
7. All buried pipe shall be prepared as hereinbefore specified and shall be laid on the prepared granular base and bedded to ensure uniform bearing. No pipe shall be laid in water or when, in the opinion of the ENGINEER, trench conditions are unsuitable. Joints shall be made as herein specified for the respective types. Take all precautions necessary to prevent uplift and floating of the pipe prior to backfilling.
8. Where pipe is to be connected to concrete structures, the connection shall be made as shown on the Contract Documents. If the connection is not shown, make connection such that a standard pipe joint is located no more than 18 inches from the structure.
9. Before excavation is started for any run of underground piping, the CONTRACTOR shall locate and expose all existing structures, piping, conduit, etc., which intersect the line of the piping, to avoid possible damage to these during excavation operations and so that it may be determined if there will be any conflicts in location. In the event of conflicts in location or grade or both, between new piping and existing piping, the CONTRACTOR shall make adjustments in location or grade of new piping as directed by the ENGINEER.

C. Exposed Pipe.

1. Where not detailed, exposed pipe shall be installed in straight runs parallel to the axes of the structures. Pipe runs shall be horizontal and vertical, except that gravity lines shall have a minimum slope of not less than 0.5 percent, unless otherwise specified.
2. No exposed piping shall be erected until all equipment to which the pipe is to be attached has been installed and it can be determined where piping and fittings shall be located to make a neat, efficient arrangement.
3. The Contract Documents shall be taken as diagrammatic for piping that is not shown in detail. Sizes of piping and their locations are indicated, but it is not intended to show every offset and fitting nor every structural difficulty that will be encountered during the installation of the Work.
4. The alignment of pipes shall be varied from that indicated on the Contract Documents, without extra expense to the TOWN where necessary to avoid structural or mechanical difficulties or to avoid the work of any other trades. The CONTRACTOR shall furnish such parts and pieces as may be necessary to provide a complete and operable system.
5. Pipework shall be suspended and supported in such manner as to prevent sagging or overstressing of pipe and connections and, furthermore, shall be supported so that no item of the piping system will transfer any load or stress to any equipment.

6. Pipe and fittings shall be assembled so there will be no distortion or springing of the pipelines. Flanges, unions, flexible couplings, and other connections shall come together at the proper orientation. The fit shall not be made by springing any piping nor shall orientation alignment be corrected by taking up on any flange bolts. Flange bolts, union halves, flexible connectors, etc. shall slip freely into place. If the proper fit is not obtained, the piping shall be altered to fit.
7. Piping shall be made up with a sufficient number of unions or flanged joints to permit ready breaking of lines as necessary for inspection and maintenance, in addition to such joints as are definitely shown on the Drawings.

3.4 TESTING

A. General.

1. Conduct pressure and leakage tests on all newly installed pipelines. Furnish all necessary equipment, instrumentation, and material including temporary plugs and blind flanges and make all taps in the pipe, as required. The ENGINEER will monitor the tests. Contractor shall notify the Engineer forty eight (48) hours prior performing any testing.
2. Where any section of pipe is provided with concrete thrust blocking, do not make the pressure test until at least 5 days have elapsed after the thrust blocking is installed. If high-early cement is used for thrust blocking, the time may be reduced to 3 days. When testing PVC piping, slowly fill the section of pipe to be tested with water and allow standing for 24 hours under slight pressure to allow the PVC pipe to accommodate swelling/absorption. Refill with makeup water before test.
3. Conduct the tests on piping after the piping has been completely installed, including all thrust blocks and anchors.
4. Hydrostatic testing. Expel all air from the piping system prior to testing and apply and maintain the test pressure hereinafter specified by means of a hydraulic force pump. Valve off the piping system when the test pressure is reached, the pressure test is conducted for 2 hours, reopening the isolation valve only as necessary to restore the test pressure. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required maintaining the test pressure may be measured accurately.
5. Repairs of defects that are discovered as a result of inspection or tests shall be made with new materials. Caulking of screwed joints, cracks, or holes will not be accepted. Tests shall be repeated after defects have been eliminated at no additional cost to the TOWN.
6. The Piping Schedule lists the pressures at which all lines shall be tested.
7. Lines to be tested with air shall be tested in accordance with Section 00 2800, Polyvinyl Chloride (PVC) Pipe. Allowable rate for the loss of one (1) pound pressure drop from (3.5 psig to 2.5 psig) per 100’ of line is as follows:

4” – 18.0 seconds	12” – 88.8 seconds	24” – 201.6 seconds
6” – 42.0 seconds	15” – 123.6 seconds	27” – 247.2 seconds
8” – 67.2 seconds	18” – 134.4 seconds	30” – 268.8 seconds
10” – 78.0 seconds	21” – 180.0 seconds	33” – 314.4 seconds

8. Exposed Pipe. Leakage shall be zero at the test pressure hereinafter specified throughout the duration for exposed piping. Conduct testing and maintain the testing pressure for two hours continuously.

C. Buried Pipe.
   1. Pipelines shall be tested and visually examined for leaks. Leakage shall be zero at the specified test pressure. All details of the testing procedure shall be subject to the review of the ENGINEER.
   2. Plug all connections with gasket caps or plugs securely fastened or backed to withstand the internal test pressure. Such plugs or caps shall be removable, and their removal shall provide a bell suitable for making a flexible jointed lateral connection or extension.
   3. Pressure tests shall be made by filling the system for two hours continuously.
   4. For hydrostatic tests, the pipe test section may be filled 24 hours prior to the time of testing, if desired, to permit normal absorption into the pipe walls to take place.

E. New pipelines that are to be connected to existing pipelines shall be tested by isolating the new pipe.

F. Force Main Testing

   1. Provide test pumps, test plugs, pipe, and gages. Make necessary piping connections.
   2. Fill the force main with potable water and flush before testing to remove entrapped air. Other water sources may be used if approved by the Engineer.
   3. Insert taps as required to remove air. Plug taps after the completion of tests
   4. Use a test pressure of 1.5 times the working pressure at the lowest point along the test section, but not less than 50 psi.
   5. Pressurize the test section and allow it to stabilize prior to beginning the leakage test.
   6. Maintain pressure to within 5 psi of the test pressure by pumping in potable water as required.
   7. Leakage is the quantity of water that must be supplied into the test section to maintain pressure within 5 psi of the specified test pressure during a 2 hour test period.
   8. The maximum allowable leakage rate for 4 inches pipe diameter is (0.19 gallon per hour per 1,000 feet of pipe).
   9. If the test indicates leakage greater than allowed, locate, repair, or replace damaged or defective pipe, and repeat test until the requirement are met.

3.5 CLEANING

A. Care shall be exercised during fabrication to prevent the accumulation of weld rod, weld splatter, pipe cuttings and filings, gravel, cleaning rags, etc., within piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter the physical properties of the material being cleaned.

B. Following assembly and testing, but prior to final acceptance, all pipelines shall be flushed with high velocity water or flushed with a cleaning ball. All accumulated construction debris and other foreign matter shall be removed. Flushing velocities shall be a minimum of 2.5 feet per second. Accumulated debris shall be removed through drains 2-inches and larger or by dropping spools and valves.

C. All leaks shall be repaired and all leaking lines retested as approved by the

ENGINEER.

D. The CONTRACTOR shall perform the deflection “mandrel” test for the sanitary sewer system as specified herein. If the amount of allowable pipe deflection is exceeded, the CONTRACTOR shall uncover the pipe and shall improve the quality of the pipe zone backfill material and/or compaction to the extent that the allowable pipe deflection is not exceeded.

E. CCTV Inspection will be performed by the Contractor at no cost to the Owner. All sanitary sewer systems shall clean prior to CCTV inspection. Contractor shall notify the Ownner 48 hours prior performing CCTV.

3.6 PIPELINE IDENTIFICATION

A. All labels and identification tags shall be installed in accordance with the manufacturer’s printed instructions, and shall be neat and uniform in appearance. All such tags or labels shall be readily visible from all normal working locations.

B. Valve tags shall be permanently attached to the valve or structure by means of 2 stainless steel bolts or screws.

C. Tracer wire shall be used for all force main piping. Tracer wire shall extend 6 inches above pipe and shall be located inside valve boxes or vaults. The tracer wire shall be secured to the pipe at intervals no greater than 10 feet.

D. Warning tape identifying the pipe similar to the identification used for exposed pipe shall be installed with all buried force main piping. The tape shall be placed directly at the top of the Pipe Zone.

3.7 DISTRIBUTING MATERIALS

A. Distribute materials along the trench only as will be used each day unless otherwise approved by the ENGINEER. Store materials in a manner that will not be a hazard to traffic or to the public in general, will not obstruct access to adjacent property, or will not obstruct other Contractors working in the area.

3.8 HANDLING AND TRANSPORTATION

A. During loading, transportation, unloading, storage, and laying, every precaution shall be taken to prevent damage to the pipe and linings. Trucks, trailers, or railway cars used for transporting pipe shall be provided with bolsters between each layer of pipe curved to fit the outside of the pipe.

B. Lifting of pipe during unloading shall be done using two slings placed at the quarter points of the pipe sections. Pipe may be lifted into the trench using one sling near the center of the pipe, provided the pipe is guided to prevent uncontrolled swinging and no damage will result to the pipe or harm to the Workers. The slings shall bear uniformly against the pipe. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. Any unit of pipe that, in the opinion of the ENGINEER, is damaged beyond repair shall be removed from the site of the Work and replaced with another unit.

C. Pipe and fittings shall not be stored on rocks or gravel, or other hard material that might damage the pipe or lining and coating. No pipe shall be allowed to rest on the

bell end of the pipe. This shall include storage areas and along the pipe trench.

D. Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

3.9 PIPE PREPARATION AND HANDLING

A. Each pipe and fitting shall be carefully inspected before being installed. The interior and exterior shall be inspected, and all damaged areas patched in the field with material equal to the original. Any pipe system that in the opinion of the ENGINEER is damaged beyond repair shall not be used and shall be promptly removed from the site. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.

B. Use proper implements, tools, and facilities for the safe and proper protection and installation of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.

3.10 SERVICE CONNECTIONS

A. Service saddles shall have a bearing area of sufficient width along the axis of the pipe so that the pipe will not be distorted when the saddle is made tight. An internal shell cutter shall be used to drill through the corporation stop to minimize PVC shavings, retain the coupon, and reduce stress. Single fluted shell cutters or twist drills will not be allowed. Lubricate the cutting and tapping edges of the tool with cutting lubricant. Make the cuts slowly and use the follower very lightly. Do not force cutter through pipe wall. Shell cutter shall have sufficient throat depth to handle the heavy wall PVC pipe.

B. Tapping of any existing main shall be coordinated with the ENGINEER. A minimum of 48 hours' notice shall be given to the ENGINEER before installation. The ENGINEER shall be present during the tapping process. After completion of the tap, the coupon shall be given to the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

Measurement and payment for various pipes are specified elsewhere in this specification, except as follows:

Measurement for 1" copper water service line shall be measured by lineal foot in place. The contract unit price paid for copper water service line shall include full compensation for labor, material, excavation, and backfill including but not limited to hose bib as shown on the plans and connecting to existing service line.

END OF SECTION 00 2600

SECTION 00 2700 - DUCTILE IRON PIPE

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. This Section covers the work necessary to furnish and install, complete the ductile iron pipe and fittings as shown on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 2600, Piping, General

B. Section 00 2800, Polyvinyl Chloride (PVC) Pipe

1.3 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

C. Submit list of pipe and fittings to be used, which includes the following information, where applicable:
   1. Manufacturer
   2. Inside diameter, outside diameter, schedule
   3. Material
   4. Pressure Rating
   5. Catalogue Information
   6. Drawings/Part List

D. Certification. The CONTRACTOR shall furnish a certified letter stating that the pipe and fittings meet all applicable AWWA standards and that the required AWWA hydrostatic pressure test is performed.

E. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

F. Submittal information shall be in accordance with Section 00 2600, Piping, General.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery at Site. All material, which will not be installed the same day, as delivered to the site shall be stored in the original manufacturer's packaging. Loose items with no original packaging shall be boxed to protect the products from scratches, abrasions, or breakage.

B. Protection Prior to Installation. All products shall be protected from excessive heat and from moisture during storage and handling.

1.5 QUALITY ASSURANCE

A. Inspection
1. All pipes shall be subject to inspection at the place of manufacture in accordance with the provisions of the referenced standards, as supplemented by the requirements herein. The CONTRACTOR shall notify the ENGINEER in writing of the manufacturing starting date not less than 14 calendar days prior to the start of any phase of pipe manufacture.
2. During the manufacture of the pipe, the ENGINEER shall be given access to all areas where manufacturing is in progress and shall be permitted to make all inspections necessary to confirm compliance with the Specifications.

B. Testing
1. Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of the referenced standards as applicable.
2. The CONTRACTOR shall perform said material tests at no additional cost to the TOWN. The ENGINEER shall have the right to witness all testing conducted by the CONTRACTOR, provided that the CONTRACTOR's schedule is not delayed for the convenience of the ENGINEER.
3. In addition to those tests specifically required, the ENGINEER may request additional samples of any material including lining and coating samples for testing by the TOWN. The additional samples shall be furnished at no cost to the TOWN.

1.6 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. The following references are part of this Section. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail. The latest edition of the following references at the time of bid shall be used.

ASTM A47	Ferritic Malleable Iron Casting
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for

	High Pressure Service
ASTM D2000	Classification System for Rubber Products in Automotive Applications
AWWA C104	Cement-Mortar Lining for Ductile-Iron and
(ANSI A21.4)	Gray-Iron Pipe and Fittings for Water
AWWA C105	Standard for Polyethylene Encasement for
(ANSI A21.5)	Ductile-Iron Piping for Water and Other Liquids
AWWA C110 (ANSI C21.10)	Ductile Iron and Gray Iron Fittings for Water and Other Liquids
AWWA C111	Rubber Gasket Joints for Ductile-Iron and
(ANSI A21.11)	Grey Iron Pressure Pipe and Fittings
AWWA C115 (ANSI A21.15)	Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges
AWWA C116 (ANSI A21.16)	Protective Fusion Epoxy Coating for Ductile Iron Fittings
AWWA C150	Thickness Design of Ductile Iron Pipe
(ANSI A21.50)	
AWWA C151 (ANSI A21.51)	Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
AWWA C153 (ANSI A21.53)	Compact Ductile Iron Fittings for Water or Other Liquids, 3” through 64”
AWWA C600	Installation of Ductile-Iron Water Mains and their Appurtenances
AWWA C606	Standard for Grooved and Shouldered Type Joints
AWWA M11	Structural Welding Code
ANSI B2.1	Pipe Threads
ANSI B16.1	Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Buried ductile iron pipe and fittings shall be Class 52 except for threaded pipe which

shall be class 53. Exposed ductile iron pipe shall be Class 53 conforming to the requirements of AWWA C150 and AWWA C151. Flange fittings shall conform to the requirements of AWWA C110. Bell joint fittings shall comply to the requirements of AWWA C110 or AWWA C153. Flanged ductile iron pipe and fittings shall conform to the requirements of AWWA C115.

2.2 JOINTS

A. General. Pipe and fitting joints shall be as indicated on the Drawings and specified in the pipe schedule. In general, exposed joints shall be flanged.

B. Flanges. Flanges shall be threaded in accordance with ANSI B2.1, with thread diameters adjusted to conform to ductile iron pipe outside diameters. Flanges shall be ductile iron with bolt circle and bolt holes conforming to Class 125 per ANSI B16.1. Flange gaskets shall be as specified in Section 00 2600, Piping, General.

2.3 LINING

A. Interior surfaces of pipe and fittings shall be cement mortar-lined in accordance with AWWA C104 unless otherwise shown on drawings. Cement shall be ASTM C150, Type II or V, low alkali, containing less than 0.60% alkalies. Lining thickness shall be a minimum of 1/8-inch for pipe 12 inches or less in diameter.

2.4 COATING

A. Exposed piping and fittings shall be painted as specified in Section 09800, Protective Coatings.

B. Unless otherwise specified, the exterior of all buried pipe and fittings shall be coated with asphaltic material as specified in AWWA C151.

C. The exterior of all buried pipe and fittings shall be wrapped with poly-wrap

2.5 PIPING EXPANSION PROVISIONS

A. Flexible couplings shall be provided for piping systems where shown. The CONTRACTOR may install additional flexible couplings to facilitate piping installation, provided that CONTRACTOR submits complete details describing location, pipe supports, and hydraulic thrust protection.

B. Flexible couplings for use with the ductile iron pipe shall have Type 316 stainless steel bolts and nuts.

C. Flexible couplings shall be as specified in Section 00 2600, Piping, General.

2.6 WARNING TAPE

A. Warning tape shall be in accordance with Section 00 2600, Piping, General.

2.7 MARKINGS

A. The CONTRACTOR shall legibly mark all pipes and specials 12 inches in diameter

and larger in accordance with the submitted laying schedule and marking diagram. Each pipe shall be numbered in sequence and said number shall appear on the laying schedule and marking diagram in its proper location for installation. All special pipe sections and fittings shall be marked at each end with top field centerline.

PART 3 - EXECUTION

3.1 GENERAL

A. Pipe shall be installed in accordance with AWWA C600.

B. Upon completion of installation, piping systems shall be flushed and cleaned as specified in Section 00 2600, Piping, General.

3.2 TESTING

A. Testing shall be as specified in Section 00 2600, Piping, General.

3.3 HANDLING, TRANSPORT, AND STORAGE

A. The pipe shall be handled by use of wide slings, padded cradles, or other devices, acceptable to the ENGINEER, designed and constructed to prevent damage to the pipe coating/exterior. The use of chains, hooks, or other equipment that might injure the pipe coating/exterior will not be permitted. All other pipe handling equipment and methods shall be acceptable to the ENGINEER.

B. The CONTRACTOR shall be fully liable for the cost of replacement or repair of the pipe that is damaged.

C. Stockpiled pipe shall be supported on wood supports. The pipe shall not be rolled and shall be secured to prevent accidental rolling.

3.4 CUTTING PIPE

A. Cut pipe with milling type cutter, rolling pipe cutter, or abrasive saw cutter. Do not flame cut.

B. Dress cut ends of pipe in accordance with the type of joint to be made.

C. Dress cut ends of pipe for flexible couplings, flanged coupling adapters, and grooved end pipe couplings as recommended by the coupling or adapter manufacturer.

3.5 PIPE JOINTS

A. Join pipe in accordance with the manufacturer's printed instructions. Provide all special tools and devices, such as special jacks, chokers, and similar items required for proper installation.

3.6 INSTALLATION OF FLEXIBLE COUPLINGS

A. Prior to installation, thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean set for the gasket. Care shall be taken that the gaskets are wiped clean before they are installed. If necessary, flexible couplings and flanged coupling adapter gaskets may be lubricated with soapy water or manufacturer's standard

lubricant before installation on the pipe ends. Install in accordance with the manufacturer's recommendations. Bolts shall be tightened progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness. Workmen tightening bolts shall be equipped with torque-limiting wrenches or other type approved for use by the ENGINEER.

3.7 CLEANING

A. Care shall be exercised during fabrication to prevent the accumulation of weld rod, weld spatter, pipe cuttings and filings, gravel, cleaning rags, etc., within piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter the physical properties of the material being cleaned.

B. Following assembly and testing and prior to final acceptance, the CONTRACTOR shall thoroughly clean all of the new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. Flushing velocities shall be a minimum of 3 feet per second. Debris cleaned from gravity pipelines shall be removed from the lowest outlet. If, after this cleaning, obstructions remain, they shall be removed. After the pipelines are cleaned and if the ground-water level is above the pipe, or following a heavy rain, the ENGINEER will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired by the CONTRACTOR.

4.1 MEASUREMENT

A. Ductile Iron Pipe will be measured for payment per lineal foot.

4.2 PAYMENT

A. The contract unit price paid for ductile iron pipe per lineal foot shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved including excavation and backfill as specified herein and per plans, complete and in place including but not limited to flexible couplings, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 2700

SECTION 00 2800 - POLYVINYL CHLORIDE (PVC) PIPE

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. This Section covers the Work necessary to furnish, install, test, and complete the polyvinyl chloride (PVC) pipe and fittings as shown on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 2600, Piping, General

B. Section 00 2700, Ductile Iron Pipe

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. The following references are part of this Section. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail. The latest edition of the following references at the time of bid shall be used.

Plastic Pipe Materials Classification and Installation and Testing Procedure.

ASTM D1784	Rigid PVC Compounds and Chlorinated PVC Compounds
ASTM D1785	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2464	Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2564	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM D2774	Underground Installation of Thermoplastic Pressure Piping
ASTM D3034	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3139	Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals
ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F402	Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings

ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F656	Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM F679	Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F913	Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In.

1.4 CONTRACTOR SUBMITTALS

A. Submittals for items specified herein shall be submitted by the CONTRACTOR and shall be in accordance with Division 1, Equipment, General, and Section 00 2600, Piping, General.

B. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

C. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

D. Submit list of pipe and fittings to be used, which includes the following information, where applicable:
   1. List of Pipe Fittings to be Used
   2. Manufacturer
   3. Model Number, if applicable
   4. Size and Schedule
   5. Material
   6. Pressure Rating
   7. Catalog Data
   8. Drawings

E. Certificates and Compliance. Certificates of compliance shall be provided for all products and materials proposed to be used under this Section as specified in the referenced standards and the following supplemental requirements:

F. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

1.5 QUALITY ASSURANCE

A. Tests. Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of this Section, and as specified in the referenced standards, as applicable.

B. The CONTRACTOR shall have said material tests performed at no additional cost to the TOWN. The ENGINEER shall have the right to witness all testing provided that the CONTRACTOR's schedule is not delayed for the convenience of the ENGINEER.

C. In addition to those tests specifically required, the ENGINEER may request additional samples of any material for testing by the TOWN. The additional samples shall be furnished at no additional cost to the TOWN.

1.6 DELIVERY, STORAGE, AND HANDLING

A. All plastic materials should be stored out of direct sunlight.

B. Delivery at Site. All materials that will not be installed the same day as delivered to the site shall be stored in the original manufacturer's packaging. Loose items with no original packaging shall be boxed to protect the products from scratches, abrasion, or breakage

PART 2 -- PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

A. All PVC pipe and fitting shall be suitable for use with raw wastewater.

B. 1/2-inch through 4 inches:

1. PVC pipe shall be C-900, Class 150, or SDR 26.0, as shown on the DRAWINGS, unless shown otherwise.
2. Pipe shall be joined using solvent cement in accordance with ASTM D2564 and ASTM D1784. Primers used on solvent cement joints shall be in accordance with ASTM F656, and handling of primers and solvent cements shall conform to ASTM F402. Solvent cements shall comply with the requirements for potable water use. Threaded and flanged joints shall be used where required. Manufacture and viscosity shall be as recommended by the pipe and fitting manufacturer to assure compatibility.
3. Threaded Lubricant. Threaded lubricant shall be teflon tape. Lubricant, if required, shall be suitable for lubricating the parts of the joints in the assembly. The lubricant shall have no deteriorating effects on the gasket and pipe material.

4. Solvent Cement. All connections to be joined by PVC (polyvinyl chloride) solvent cement shall be industrial grade and shall conform to ASTM D2564 and shall bear a dated stamp on the container indicating the date of manufacture. Manufacture and viscosity shall be as recommended by the pipe and fitting manufacturer to assure compatibility. PVC flanges shall be supplied with all necessary gaskets, bolts, and nuts. Gaskets shall be full face, 1/16-inch thick Viton. Primers used on solvent cement connections shall be in accordance with ASTM F656 and handling of primers and solvent cements shall conform to ASTM F402.

C. Force main Pipe:

1. Force main piping shall conform to AWWA C900 meeting DR 25 for PVC pipe with cast-iron outside diameters.
2. All piping shall be continuously marked in conformance with the appropriate ASTM.
3. Joining of PVC pipe shall be with elastomeric gasket bell ends or couplings. The bell ends shall be integral thickened bell end or an integral sleeve-reinforced bell end. The bell end joints shall have a minimum wall thickness of the bell or sleeve-reinforced bell equal, at all points, to the DR (dimension ratio) requirements for the pipe. The minimum wall thickness in the ring groove and bell-entry sections shall equal or exceed the minimum wall thickness of the pipe barrel.
4. One PVC coupling, manufactured of the same material and by the same manufacturer as the pipe, shall be furnished with each length of pipe together with two (2) rubber rings. The couplings shall be designed so as to ensure a watertight joint with the pipe. The couplings body and sockets shall have a wall thickness equal to the pipe barrel thickness with which the coupling is to be used.
5. All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (elastomeric gaskets) shall be manufactured to conform with the requirements of ASTM F477.
6. Deflections at joints shall not exceed 50 percent of maximum deflection recommended by the manufacturer. No deflection at joint shall be allowed for joints that are over-belled or not belled to the stop mark. Joint deflection has not been designed and substituting joint deflection for special fittings shown on the Drawings is not permitted.
7. Bending of pipe shall not exceed recommendations of AWWA or manufacturer's printed recommendations.

D. Force main fittings shall be PVC as specified below:

1. PVC. PVC pressure fittings shall be manufactured in accordance with AWWA C900 and shall be DR 18 with CI pipe outside diameters. Elbows 45 degrees and less and all tees and crosses shall be cast or formed as a single piece or from pieces, formed from single pipe pieces and solvent welded to form durable, stable pressure rated fittings. All fittings shall be manufactured with integral bell and spigot joints and shall comply with ASTM D3139. Fittings shall be provided with elastomeric gaskets complying with ASTM F477. Fittings shall be PVC pressure fittings as manufactured by Nyloplast, or equal. Where non-standard angle PVC pressure fittings are required, custom made fittings to the required angulation shall be made.

E. Gravity Sewer Pipe.

1. Gravity sewer pipe shall conform to ASTM F679 with integral bell gasketed joints. Polyvinyl chloride (PVC) pipe shall be manufactured from rigid, unplasticized polyvinyl chloride compound complying with ASTM D1784, Type 1, Grade 1 (Class 12454-B or 12364) and shall have a SDR of 26 and minimum stiffness of 115 psi.
2. Joints. Unless otherwise indicated or shown on the Contract Drawings, PVC pipe and fittings shall have gasketed or solvent welded joints. Elastomeric gaskets shall conform to ASTM F477. All gaskets shall be suitable for corrosive air from the wet well and temperatures up to 200 degrees F. Where PVC pipe and fittings connect to valves, flexible connectors, or fans, and where shown on the Drawings, connections shall be made with flanges, unless shown otherwise. Adapter flanges may be used for connection.

2.2 RESTRAINED JOINTS

A. General. Unless otherwise shown on the drawings or directed by the ENGINEER, all thrust at buried elbows, tees, valves, and other fittings shall be accommodated with thrust blocks.

B. Restraints. Restraints for PVC pipe and PVC fitting shall conform to the recommendations of the pipe and fittings manufacturers, respectively. Restraints shall be sized to accommodate the highest allowable pressure of the adjoining pipe.

PART 3 -- EXECUTION

3.1 GENERAL

A. Upon completion of installation, piping systems shall be flushed and cleaned as specified in Section 00 2600, Piping, General.

B. All rigid polyvinyl chloride (PVC) pipe shall be cut square, burrs removed, made up, and installed in accordance with the pipe manufacturer's recommendations, as approved. Offset shall be as recommended by the manufacturer for the maximum temperature variation between time of solvent welding and final use.

C. Pipe shall not be laid when the temperature is below 40 degrees F, nor above 120 degrees F when exposed to direct sunlight. Ends to be joined shall be shielded from direct sunlight prior to and during the laying operation.

D. Provide adequate ventilation when working with pipe joint solvent cement.

3.2 TESTING

A. Testing shall be as specified in Section 00 2600, Piping, General.

B. Prior to inspection and testing, stabilize piping by bringing it approximately to operating temperature before testing.

C. A 24-hour cure period shall be required for solvent welded joints before the system is pressure tested.

D. All leaks shall be repaired and all leaking lines retested as approved by the ENGINEER.

E. The CONTRACTOR shall perform the deflection "mandrel" test for the sanitary sewer system as specified herein. If the amount of allowable pipe deflection is exceeded, the CONTRACTOR shall uncover the pipe and shall improve the quality of the pipe zone backfill material and/or compaction to the extent that the allowable pipe deflection is not exceeded.

F. All sanitary sewer systems shall be tested as specified. All sanitary sewer gravity lines shall be tested for leakage using a low pressure air test. All leakage tests shall be completed and approved prior to placing of permanent surfacing. When leakage exceeds the amount allowed, the CONTRACTOR, at his expense, shall locate the leaks and make the necessary repairs or replacements to reduce the leakage to the

specified limits, in accordance with the Specifications. Any individually detectable leaks shall be repaired regardless of the results of the tests.

G. During flushing of the sewer lines, the maintenance hole at the low end of the new line shall be plugged and incoming water pumped to a drain point approved by the TOWN. Before the plug can be removed, all sand, silt, gravel, and other foreign material shall be completely removed from the maintenance manhole.

H. Deflection. All PVC non-pressure pipe shall be tested for deflection obstructions and protruding laterals by passing a “mandrel” from the nearest downstream structure to the nearest upstream structure. The “deflection test” procedure shall be acceptable to the ENGINEER. The “mandrel” diameter shall be 95 percent of the pipe inside diameter.

I. Air Pressure Test. The CONTRACTOR shall furnish all materials, equipment, and labor for making an air test. Air test equipment shall be approved by the ENGINEER.

1. The CONTRACTOR may conduct an initial air test of the sewer main line after densification of the backfill but prior to installation of the laterals. Such tests will be considered to be for the CONTRACTOR’S convenience and need not to be performed in the presence of the ENGINEER.
2. Each section of the sewer shall be tested between successive maintenance manholes by plugging and bracing all openings in the main sewer line and the end of all laterals. Prior to any air pressure testing, all pipe plugs shall be checked with a soap solution to detect any air leakage. If any leaks are found, the air pressure shall be released, the leaks eliminated and the test procedure started over again.
3. The final leakage test of the sewer main line and laterals shall be conducted in the presence of the ENGINEER.
4. The test procedure shall be conducted by first increasing the pressure within the line to approximately 4 psi using a compressed air supply. After the air supply is turned off or disconnected, there shall be a two minute waiting period to allow stabilization of air within the sewer line before the actual test begins. In no case shall the test pressure within the line be less than 3.5 psi when the test begins. The allowable air pressure loss shall not exceed 1 psi. After completion of the test, the air pressure shall be released slowly and the test plugs shall not be removed until the air pressure is no longer measurable. The test periods for all sewer pipes other than VCP shall be determined using the Ramseier's equation, as follows:

$$T = 0.085 * (DK)/Q$$

Where: T = Shortest time, in seconds, allowed for the air pressure to drop to 1.0 psig.
K = 0.000419 DL, but not less than 1.0.
Q = 0.0015 cubic feet/minute/square feet of internal surface.
D = Nominal pipe diameter in inches.
L = Length of pipe being tested in feet.

5. At the CONTRACTOR’S option, joints may be air tested individually, joint by joint, with the use of specialized equipment. The CONTRACTOR shall submit its joint testing procedure for the ENGINEER’S review prior to testing. Prior to each test, the pipe at the joint shall be wetted with water. The maximum test pressure shall be 3.0 psi. The minimum allowable pressure drop shall be 1.0 psi over a 30-second test period.

J. TV Inspection. All sanitary sewer systems shall be TV inspected. In all paved areas the TV inspection must be coordinated by the CONTRACTOR to allow sufficient time for the TV inspection to be performed prior to the final lift of asphalt paving being placed. The TOWN or approved TV testing company will perform the TV inspections. The CONTRACTOR shall repair all problems revealed by the TV inspection. The CONTRACTOR shall coordinate with the ENGINEER to arrange for a compatible time to conduct the inspection.

3.3 HANDLING, TRANSPORT AND STORAGE

A. All pipes shall be handled and packaged in such a manner as to provide adequate protection for the pipe and the pipe ends during transportation from manufacturer and supplier to the site.

B. Pipe, fittings, and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, and accessories shall be cleaned and shall be maintained in a clean and sanitary condition. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe, fittings, or any other material be dropped or dumped into trenches.

C. The pipe shall be handled by devices designed and constructed to prevent damage to the pipe.

D. The CONTRACTOR is fully responsible for the cost of replacement or repair of pipe that is damaged.

E. Stockpiled pipes shall be supported on wood supports. Space supports to prevent pipe bending. When pipes are stacked, the weight of the upper pipes shall not cause deformation of the lower pipes.

F. Store solvent cement in tightly sealed containers in a cool place.

G. Pipe shall be stored, if possible, at the jobsite in unit packages provided by the manufacturer. Caution is to be exercised to avoid compression damage or deformation to bell ends of the pipe. Pipe shall be stored in such a way as to prevent sagging or bending and protected from exposure to direct sunlight by covering with an opaque material while permitting adequate air circulation above and around the pipe. Gaskets shall be stored in a cool, dark place, out of the direct rays of the sun, preferably in original cartons. Pipe, fittings, or accessories improperly stored are subject to rejection by the ENGINEER.

3.4 INSTALLATION

A. The installation of plastic pipe valves, fittings and tubing shall be in strict accordance with the manufacturer's technical data and printed instructions, including the use of expansion joints and/or expansion loops, necessary for the piping to tolerate a 100 degree F change in operating temperature or any straight run of greater than 40 feet.

B. All laying, jointing, testing for defects and for leakage shall be performed in the presence of the ENGINEER and shall be subject to his/her approval before

acceptance. All material found during the process to have defects will be rejected and the CONTRACTOR shall promptly remove such defective materials from the site of the work.

C. Particular care should be taken to avoid overstressing or breaking of the pipe at the sleeves.

D. Metal piping shall not be threaded into plastic fittings, valves, or couplings, nor shall plastic piping be threaded into metal valves, fittings, or couplings.

E. Pipe shall be laid and installed per Section 00 2600, Piping, General, the manufacturer's instruction, and AWWA M23. Wherever the provisions of this section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

F. Solvent Weld Joints. Solvent welding shall be done in accordance with ASTM D2855 and ASTM F402.

G. Pipe conforming to AWWA C900 and AWWA C905 shall be installed per AWWA C605 unless specified otherwise.

H. Bell and spigot pipe shall be laid with the bell end pointing in the direction of laying. Pipe shall be set to grade in straight lines, taking care to avoid the formation of any dips or low points. Pipe shall not be laid when the conditions of trench or weather are unsuitable as determined by the ENGINEER. At the end of each day's work, open ends of pipe shall be closed temporarily with water-tight, expandable type plugs.

I. Pressurized lines laid on a downhill grade shall be blocked and held in place until sufficient support is furnished by the following pipe to prevent movement. Waterlines shall be laid uphill on grades exceeding 10 percent.

J. Pipe shall be supported at its proper elevation and grade, care being taken to secure firm and uniform support. Wood support blocking will not be permitted. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recessed excavation to accommodate bells and joints. Anchors and supports shall be provided where necessary and where indicated on the Drawings for fastening work into place. Fittings shall be independently supported.

K. Joints shall be installed according to manufacturer's recommendations. Trenches shall be kept free of water until joints have been properly made. The maximum combined deflection at any coupling shall be in accordance with the manufacturer's printed recommendations.

L. Pipe shall be cut by means of saws, power driven abrasive wheels, or pipe cutters that will produce a square cut. No wedge-type roller cutters will be permitted. After cutting, the end of the pipe shall be beveled using a beveling tool, portable type sander, or abrasive disc.

M. All necessary precautions shall be taken to prevent uplift or floating of the pipe prior to the completion of the backfilling operation. The CONTRACTOR shall assume full responsibility for any damage due to this cause and shall, at his own expense, restore and replace the pipe to its specified condition and grade if it is displaced due to floating.

N. Each pipe elastomeric gasket joint shall be installed in conformance with the manufacturer's printed recommendations.

O. Pipe, fittings, and accessories shall not be stored in direct sunlight. Pipe shall be stored in such a manner as to prevent sagging or bending. Pipe supports shall be properly and adequately supported and anchored so as to maintain the supported loads in proper position under all operating conditions without unnecessary movement or strain on any piece of equipment. Thrust blocks shall be provided where necessary to resist system pressure on fittings.

P. Any section of pipe that has been dented or damaged or in another way found to be defective, either before or after placing, shall be replaced with sound pipe without additional expense to the TOWN.

Q. All piping shall have a sufficient number of unions to allow convenient removal of piping and shall be as approved by the ENGINEER.

R. Particular care should be taken to avoid overstressing or breaking of the pipe at the sleeves.

S. Underground installation of PVC pipe, fittings and valves shall be as specified below and in ASTM D2274.

T. Where place pipe passes through walls, wall penetrations shall be made as shown on the Drawings.

U. All plastic pipe to valves and metal pipe connections shall be made using flanged connections. Metal piping shall not be threaded into plastic fittings, valves, or couplings, nor shall plastic piping be threaded into metal valves, fittings or couplings.

3.5 PAINTING

A. All unburied polyvinyl chloride (PVC) piping shall be coated with Protective Coatings.

3.6 PIPELINE IDENTIFICATION

A. Buried force main shall be provided with detectable marking tape as specified in Section 00 2600, Piping, General.

3.7 SUPPORTS AND HANGERS

A. Pipe supports shall be as specified by the Plans, manufacturer's recommendations and in accordance with Section 00 2600, Piping, General.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. PVC pipe will be measured on a lineal foot basis for the various sizes and types listed in the Bid Form.

4.02 PAYMENT

A. The contract price paid per linear foot for various PVC pipe listed in the Bid Form shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in excavating, installing pipe and backfilling, including but not limited to flexible couplings, complete in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

B. The contract price paid for wye and band coupling per each shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved, complete in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 2800

SECTION 00 2900 - VALVES, GENERAL

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, coating, lining, installing, adjusting, and testing of all valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are shown, the CONTRACTOR shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.

B. The provisions of this Section shall apply to all valves and valve operators as specified herein in these Specifications and as shown on the plans. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other Sections of the Specifications.

1.2 RELATED WORK

A. Not Used

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. The following references are part of this Section. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of the most stringent shall prevail. The latest edition of the following references at the time of bid shall be used:

ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys.
ANSI/ASME B1.20.1	General Purpose Pipe Threads (Inch).
ANSI/ASME B31.1	Power Piping.
ASTM A36	Specification for Structural Steel.
ASTM A48	Specification for Gray Iron Castings.
ASTM A126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
ASTM A536	Specification for Ductile Iron Castings.

ASTM B61	Specification for Steam or Valve Bronze Castings.
ASTM B62	Specification for Composition Bronze or Ounce Metal Castings.
ASTM B148	Specification for Aluminum-Bronze Castings.
ASTM B584	Specification for Copper Alloy Sand Castings for General Applications.
ANSI/AWWA C500	Gate Valves for Water and Sewage Systems.
ANSI/AWWA C506	Backflow Prevention Devices-Reduced Pressure Principle and Double Check Types.
ANSI/AWWA C507	Ball Valves 6 Inches Through 48 Inches.
AWWA C508	Swing-check Valves for Waterworks Service, 2 Inches Through 24 Inches NPS.
ANSI/AWWA C509	Resilient-Seated Gate Valves, 3 Through 12 NPS, for Water and Sewage Systems.
AWWA C550	Protective Interior Coatings for Valves and Hydrants.

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

C. Shop Drawings. Shop drawings of all valves and operators, as shown or as specified, including associated wiring diagrams and electrical data, shall be furnished.

D. Valve Labeling. The CONTRACTOR shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label. Valve labels shall be similar to equipment nameplates as specified herein.

E. The valve manufacturer shall furnish detailed technical information as required by the ENGINEER for evaluating the quality of the valves and as required by the CONTRACTOR for proper valve installation. The technical information shall include complete dimensions, weights, and material lists. No valve will be approved for installation until the required information has been received and reviewed.

F. The CONTRACTOR shall furnish to the pipe suppliers, after valves are selected, the face-to-face dimensions of all valves to be installed in pipelines so that the pipe may be fabricated to the proper length.

1.5 QUALITY ASSURANCE

A. Valve Testing. Unless otherwise specified, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.

B. Bronze Parts. Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B62.

C. Like items of equipment specified herein shall be the end product of one manufacturer in order to achieve standardization for operation, maintenance, spare parts and manufacturer's service.

D. The manufacturer of valves as specified herein and in Division 15 shall be responsible for the purchase, coordination, and testing of the valve systems, including valves, actuators, and appurtenances.

E. Submittals shall be integrated and shall demonstrate that all systems elements have been fully coordinated.

1.6 STORAGE AND MAINTENANCE OF DELIVERED EQUIPMENT

A. The CONTRACTOR shall supply the same equipment (i.e., manufacturer, make, and model number) as specified. Submittals shall be submitted for all like equipment at the same time regardless of where or when the equipment is to be installed. The manufacture of all said equipment shall also be performed at the same time. The delivery of all said equipment shall also be at the same time.

B. The equipment delivered prior to installation shall be stored where it is protected from theft, vandalism, and deterioration due to the elements.

C. All equipment delivered in excess of sixty (60) days prior to its installation date shall be accompanied by manufacturer's maintenance instructions outlining all requirements to maintain the equipment in top condition while in storage. The CONTRACTOR shall provide the manufacturer with all the target installation dates. The CONTRACTOR shall also provide the ENGINEER with a copy of all such maintenance instructions.

1.7 SEISMIC ANCHORAGE

A. All equipment and appurtenant facilities shall be seismically anchored.

PART 2 -- PRODUCTS

2.1 VALVES

A. General.

1. The CONTRACTOR shall furnish all valves, valve-operating units, stem extensions, and other accessories. All valves of the same style or type shall be furnished by a single manufacturer. All valves shall have the name of the maker and the working water pressure for which they are designed cast in raised letters upon some appropriate part of the body. All valves and gates shall be new and of current manufacture. All shut-off valves, 6-inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes and covers containing position indicators, and valve extensions.
2. Wherever stainless steel is specified in this Section, it shall be AISI Type 316, unless otherwise specified.
3. Gate and globe valves shall be installed with stems horizontal or vertical above the pipe, except as specifically indicated otherwise.

B. Valve Flanges. The flanges of valves shall be in accordance with Section 00 2600, Piping, General.

C. Gate Valve Stems. Bronze gate valve stems shall be of bronze to ASTM B62, containing not more than 5 percent of zinc nor more than 2 percent of aluminum. For valve stems with a minimum tensile strength of 60,000 psi, a minimum yield strength of 40,000 psi, and an elongation of at least 10 percent in 2 inches.

D. Protective Coating. Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves 4-inch and larger, as well as the exterior surfaces of all valves, shall be coated as specified in Section 09800, Protective Coatings. Flange faces of valves shall not be coated. The valve manufacturer shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications.

E. Manual Valve Operators. Each manually operated valve shall be provided with a hand wheel or lever operator unless specifically shown otherwise. Any valve installed with the valve operator center line more than 5-foot 0-inches above the operating floor shall be provided with a chain wheel operator. Manual valve operators shall be designed for not less than 125 percent of the operating torque required for the service. Hand wheels shall be sized to require an operating force of not more than 40 pounds, and shall have arrows cast thereon to indicate the direction of rotation for opening the valve.

F. Valve Operators (Other Than Manual). Where shown, certain valves shall be furnished with operators, provided by the valve manufacturer. All operators of a given type shall be furnished by the same manufacturer. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Unless otherwise specified, operators shall be in accordance herein and in Division 15.

G. Bolts and Miscellaneous Metalwork. Where dissimilar metals are being bolted, stainless steel bolts shall be used. Underground bolts shall be Type 316 stainless steel, unless specifically noted to the otherwise.

PART 3 -- EXECUTION

3.1 VALVE INSTALLATION

A. General. All valves, operating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the manufacturer's written instructions and as shown and specified. Valves shall be firmly supported to avoid undue stresses on the pipe.

B. Access. All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members, handrails, piping, etc.

D. Valve Accessories. Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the CONTRACTOR to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on Shop Drawing Submittals.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. The work performed for Fitting, Valves, Quick Connector, wetwell air vent and Miscellaneous Appurtenances will be measured on a lump sum basis

4.02 PAYMENT

A. The contract lump sum price paid for Fitting, Valves. Wetwell air vent, Christy P52 Box with 3 foot extension and N52D3 Lid and Christy G12 with traffic lid, and Appurtenances listed in the Bid Form shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in excavating, installing pipe and backfilling, complete in place, as shown on the plans, as specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 2900

SECTION 00 3000 - CHECK VALVES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install all check valves in the types and sizes shown and specified, complete and operable, including coating, appurtenances, and accessories, in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 2900, Valves, General

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section; provided, that for Building Codes, the latest edition of the code, as adopted as of the date of award by the agency having jurisdiction, shall apply to the Work.

B. The following references are part of this Section. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail. The latest edition of the following references at the time of bid shall be used:

ASTM A126 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

ASTM A148 Specification for Steel Castings, High Strength, for Structural Purposes.

ASTM A276 Specification for Stainless and Heat-Resisting Steel Bars and Shapes.

ASTM A536 Specification for Ductile Iron Castings.

1.4 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the

specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

1.5 STORAGE AND MAINTENANCE OF DELIVERED EQUIPMENT

A. The CONTRACTOR shall supply the same equipment (i.e., manufacturer, make, and model number) as specified. Submittals shall be submitted for all like equipment at the same time regardless of where or when the equipment is to be installed. The manufacture of all said equipment shall also be performed at the same time. The delivery of all said equipment shall also be at the same time.

B. The equipment delivered prior to installation shall be stored where it is protected from theft, vandalism, and deterioration due to the elements.

C. All equipment delivered in excess of sixty (60) days prior to its installation date shall be accompanied by manufacturer's maintenance instructions outlining all requirements to maintain the equipment in top condition while in storage. The CONTRACTOR shall provide the manufacturer with all the target installation dates. The CONTRACTOR shall also provide the ENGINEER with a copy of all such maintenance instructions.

1.6 MANUFACTURER/SUPPLIER'S SERVICES

A. A manufacturer/supplier's representative shall be present at the job site for a minimum of one half man day, travel time excluded, for assistance during installation, equipment startup, and testing. Additional requirements for training are specified herein.

PART 2 -- PRODUCTS

2.1 SWING OR BALL CHECK VALVES (2 INCHES OR LARGER)

A. Equipment Requirements. All check valves except as otherwise indicated below shall be swing check valves and shall be of the lever and weight type, designed for a water-working pressure of 150 psi, unless otherwise shown on the Project Drawings or piping schedule, and shall have a flanged cover piece to provide access to the disc. All ferrous surfaces of valves shall be factory fusion bonded epoxy lined and coated in conformance with AWWA C550, C213, and Section 09800, Protective Coatings.

B. All check valves shall be designed for operation in either horizontal or vertical flow up position.

C. For check valves 2 inches in size and larger, the valve body and cover shall be ASTM A126, Class B, cast-iron, flanged end. The valve seat shall be stainless steel (ASTM A276) and locked in place with stainless steel screws and be field replaceable without the use of special tools. The disc and seats shall be field replaceable without disconnecting either inlet or outlet flanges.

D. The valve disc shall be ductile iron, ASTM A536 or cast-iron, ASTM A126, Class B utilizing a double clevis and connected to a ductile iron disc arm. Disc arm shall be ductile iron, ASTM A536. The disc seat shall be resilient Buna-N and shall be easily

replaceable in the field without the use of special tools. Disc seat shall provide for water tight shut-off. Hinge pins shall be stainless steel. The lever and weight shall be so constructed and so positioned that it can operate without interference by any piping, supports, or equipment.

E. The pivot shaft shall be continuous stainless steel, and fully extended from the body. Four mounting holes shall be provided on the side of the valve body for future provisions of air or oil cushion cylinder. The shaft supplied shall be sized to accommodate forces generated by the dampening unit (oil or air) that will create the largest forces.

F. Check valves shall be suitable for intended use.

G. Swing check valves shall be as manufactured by, or approved equal:

1. Apco Valve, Series 6000, CLW

2. Golden Anderson Industries, Fig. 220-DS

H. Ball check valves shall be as manufactured by, or approved equal:

1. Flomatic Ball Check Valve, Model 408

I. CONTRACTOR shall verify valve dimensions to ensure the valves fit into the valve box and are accessible for maintenance and can operate without interference by any piping, supports, walls, or equipment.

2.2 SPARE PARTS AND SPECIAL TOOLS

A. CONTRACTOR shall provide special tools and a list of recommended spare parts with price list.

PART 3 -- EXECUTION

3.1 GENERAL

A. All check valves shall be installed in strict accordance with the manufacturer's instructions.

3.2 PAINTING

A. All check valves shall be factory painted. Where surfaces have been shop painted but have been damaged during delivery, storage or assembly, or where shop coats have deteriorated, these surfaces shall be properly cleaned and retouched or repainted with matching paint.

B. Ferrous internal surfaces of valves, 4 inches and larger, which will be in contact with wastewater shall be lined Protective Coatings.

3.3 VALVE INSTALLATION

A. General. All valves and accessories shall be installed in accordance with the manufacturer's written instructions and as shown and specified. Valves shall be firmly supported to avoid undue stresses on the pipe.

B. Access. All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and piping and structural members.

C. Check valves shall be field adjusted by manufacturer’s representative to provide for no backflow and no slamming on closure.

PART 4 - MEASUREMENT AND PAYMENT

Measurement and Payment for valves are as specified in Section 2900 of these specifications.

END OF SECTION 00 3000

SECTION 00 3100 - MISCELLANEOUS VALVES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install miscellaneous valves as shown and as specified herein, complete and operable including accessories and, where designated, operators, all in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00 2900, Valves, General

1.3 CONTRACTOR SUBMITTALS

A. A copy of this specification section, with any addendum updates included, and all referenced and applicable sections, with any addendum updates included, shall be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (□) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for1any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

B. Submittals shall be provided to confirm that materials to be used comply with information specified herein.

C. Submit complete valve fabrication drawings with parts list, material specification, dimensions, and construction details for all parts used in the construction of the valves and operators in accordance with the requirements. Prior to manufacture, submit for approval drawings, dimensions, and parts list with materials of the valves and operators.

PART 2 -- PRODUCTS

2.1 SEWAGE AIR RELEASE VALVE

A. Sewage air release valve shall perform the function of automatically exhausting quantities of air accumulated in the system. The air release portion shall automatically exhaust small amounts of entrained air under operating pressures that may accumulate in the system.

C. Valves shall be designed for minimum 150 psi water-working pressure, unless otherwise shown.

C. Sewage air release valves shall be designed to minimize clogging.
   1. Sewage air release valves shall be manufactured by Vent-O-Mat, RGX.

2.2 KNIFE VALVE

A. Knife valves shall be sized as shown on the Plans.
   1. Knife valves shall be manufactured by DeZurik, Cast Stainless Steel Knife Gate Valves.

2.3 PVC BALL VALVE

A. PVC ball valve used on the 3-inch PVC SDR26 air jumper and 4-inch wet well vent shall be sized and located as shown on the Plans.
   1. PVC ball valve shall be manufactured by Nibco, Schedule 40 PVC 4660-S or 4660-T, depending on application, or approved equal.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. All valves shall be installed in accordance with the Supplier's printed recommendations and operating manuals shall be furnished with all valves.

B. The CONTRACTOR shall field adjust the flow limiting assembly so that the incoming flow to the air gap tank matches the maximum outgoing flow that the water pump will pump.

PART 4 - MEASUREMENT AND PAYMENT

Measurement and Payment for valves are as specified in Section 2900 of these specifications.

END OF SECTION 00 3100

SECTION 00 3200 – GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work Included:
1. Provide all required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, and test equipment, and satisfactorily complete all electrical work shown on the Drawings, included in these Specifications, or required for a complete and fully operating facility. In addition, provide wiring and connections to existing equipment and for the equipment that will be provided under other sections of these Specifications.
2. Provide all conduit for the Instrumentation and Controls specified in Section 00 3400. Provide all Instrumentation and Control as specified in Section 00 3500. All other necessary Instrumentation and Controls wire shall be provided as herein specified and specified elsewhere in these specifications.
3. Auxiliary Devices: Provide conduit and wire for power and control for all auxiliary devices such as solenoid valves, pressure switches, and instruments that are included as part of a manufacturer's packaged system as specified herein and specified elsewhere in these specifications. Contractor shall be responsible for conduit and wire to these auxiliary devices even if not specifically shown on the Drawings or specified herein.

B. Work Specified in Other Sections:
1. Section 00 2500: Submersible pumps and equipment
2. Section 00 4100: Instrumentation and Control

D. Safety: Conduct operations in accordance with NFPA 70E, Standard for Electrical Safety Requirements for Employee Workspaces.

E. Order of Work:
1. The Contractor’s first order of work for the electrical, instrumentation and control work shall be to provide submittals for the long-lead items - the electric service/control cabinet, the generator and the BAAQMD application.
2. The estimated time needed to obtain the new electric service/control cabinet is approximately 10 weeks. Section 3800 states that the Contractor shall submit the BAAQMD application within 15 days of the notice to proceed.
3. The Contractor, in cooperation with the Town, shall initiate coordination with PG&E and AT&T soon after receiving the notice to proceed.

1.02 SUBMITTALS

A. Shop Drawings:
1. General: Submit Product Review or Product information shop drawings for materials and equipment as required under each Specification section.
2. For Product Review submittals, submit a single, complete submittal package for all electrical, instrumentation and control equipment. The submittal package shall be organized by Specification section. Include separators and tabs or other means of identifying each section of the submittal.

B. As-Built Shop Drawings: Revise manufacturer's shop drawings to show any construction changes. Prior to final acceptance, deliver one complete set to the

Engineer for his favorable review. After such review, provide copies of all CAD produced drawings on magnetic media satisfactory to the Engineer in AutoCAD DWG format.

C. Operation and Maintenance Manuals:
   1. Furnish manuals for all electrical, instrumentation and control equipment specified in the equipment Specifications.
   2. In each manual, include equipment descriptions, record shop drawings, operation and maintenance instructions, parts ordering data and ratings for the equipment furnished for this project.

D. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.

1.03 QUALITY ASSURANCE

A. Electrical equipment, materials, and installation methods shall conform to all applicable local and state codes as well as the editions of the following in effect on the date of issuance of the Contract Documents.
   1. National Electrical Code (NEC)
   2. National Electrical Safety Code (NESC)
   3. Occupational Safety and Health Act (OSHA) standards
   4. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association (NETA)

B. Variances: In instances where two or more codes are at variance, the most restrictive requirements 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). The revisions of these standards in effect on the date of issuance of the Contract Documents shall apply.

D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the authority having code enforcement jurisdiction. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. Contractor's Expense: Obtain and pay for all required bonds, insurance, licenses, permits and inspections, and pay all taxes, fees and utility charges that will be required for the electrical construction work.

1.04 DRAWINGS

A. Drawings: The Electrical Drawings are diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or material, the requirements or descriptions in this Specification shall take precedence in the event of conflict.

1. Locations of equipment, inserts, anchors, motors, panels, pull boxes, manholes, conduits, stub-ups, fittings, lighting fixtures, power and convenience outlets, exterior lighting units and ground wells are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verifies scaled dimensions on Drawings.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the 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 Engineer for favorable review.

4. Resolution of conflicting interpretations of the Contract Documents shall conform to Division 1, General Conditions.

B. As-Built Drawings:
1. Maintain a complete and accurate record set of Drawings for the electrical construction work.
2. Record all work that is installed differently than shown on the Drawings.
3. Upon completion of the work, transfer all marked changes to a clean set of full-size Drawings with red ink. Mark the Drawings "AS-BUILT DRAWINGS" and submit them to the Engineer when the electrical work is completed.
4. Locate all underground conduits by accurate field-measured dimensions from walls and corners, etc., of surrounding structures.

1.05 FACTORY TESTS

A. Submit reports of factory tests and adjustments performed by equipment manufacturers to the Engineer prior to field testing and adjustment of the equipment. These reports shall identify the equipment and show dates, results of tests, measured values and final adjustment settings. Provide factory tests and adjustments for equipment where factory tests are specified in the equipment Specifications.

1.06 INSPECTIONS

A. The Engineer may inspect the fabricated equipment at the factory before shipment to job site. Provide the Engineer with sufficient prior notice so that an inspection can be arranged at the factory.

B. Inspection of the equipment at the factory by the Engineer will be made after the manufacturer has performed satisfactory checks, adjustments, tests and operations.

C. Favorable review of the equipment at the factory only allows the manufacturer to ship the equipment to the project site. The Contractor shall be responsible for the proper installation and satisfactory startup operation of the equipment to the satisfaction of the manufacturer and the Engineer.

1.07 COORDINATION

A. Coordinate the electrical work with the other trades, code authorities, utilities, and the Owner.

B. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the plant and privately owned facilities.

C. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 JOB CONDITIONS

A. Operations:
1. Keep all power shutdown periods to a minimum.
2. Carry out shutdowns only after the schedule has been favorably reviewed by the Engineer.

B. Construction Power:
1. Make all arrangements for the required construction power.
2. When required, provide all equipment, materials and wiring in accordance with the applicable codes and regulations.
3. Upon completion of the project, remove all temporary construction power equipment, material and wiring from the site as the property of the Contractor.

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.

1.10 DAMAGED PRODUCTS

A. Notify the Engineer in writing in the event that any equipment or material is damaged.

B. Obtain prior favorable review by the Engineer before making repairs to damaged products.

1.11 OPTIONAL EQUIPMENT

A. For optional or substituted equipment, refer to Division 1, General Conditions.

1.12 LOCATIONS

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located, as defined in Paragraph B. herein.

B. Definitions of Types of Locations:
1. Dry Locations: All those indoor areas which do not fall within the definitions below for Wet, Damp, Hazardous, or Corrosive Locations and which are not otherwise designated on the Drawings.
2. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.
3. Hazardous Locations: All areas in which fire or explosion hazards may exist, normally or accidentally, due to flammable gases or vapors,

flammable liquids, combustible dust, or ignitable fibers or flyings. These areas are shown on the Drawings, together with the Class and Division designations as defined in the NEC, determining the enclosure types and wiring methods 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 favorably reviewed by the Engineer prior to installation.

B. It is the intent of these Specifications and Drawings to secure high quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses, which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed, braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details.

C. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble-free service. Light-duty, fragile and competitive grade devices of doubtful durability shall not be used.

2.02 NAMEPLATES

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings and the model designation.

B. Identify each piece of equipment and related controls with a rigid laminated engraved phenolic nameplate. 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 screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscription is indicated on the Drawings, furnish nameplates with an appropriate inscription furnished by the Engineer upon prior request by the Contractor.

C. Each control device, including pushbuttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.

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. Provide stainless steel fasteners in Corrosive Locations. When fastening to existing walls, floors, and

the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is 3/16-inch.

2.04 PAINTING

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 Engineer.

B. Wiring System: Paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed. Paint finishes shall include proper surface preparation, prime coat and a final finish coat, and shall conform to Section 09960.

2.05 ENCLOSURES

A. Unless otherwise noted, provide enclosures as follows:
   1. Dry Locations: NEMA Type 1
   2. Wet Locations: NEMA Type 4 or 4X
   3. Hazardous Locations: NEMA Type 7

PART 3 - EXECUTION

3.01 REQUIREMENTS

A. All electrical installations shall conform to the codes and standards outlined in this Section.

3.02 WORKMANSHIP

A. Assign a qualified representative who shall supervise the electrical construction work from beginning to completion and final acceptance.

B. Perform all labor using qualified craftsmen, who have had experience on similar projects. Provide first-class workmanship for all installations.

C. Ensure that all equipment and materials fit properly in their installations.

D. Perform any required work to correct improperly fit installations at no additional expense to the Owner.

3.03 EXCAVATION AND BACKFILL

A. Provide the excavations for electrical equipment foundations and trenches for conduits as shown on the Drawings.

B. Exercise caution during all excavation work and avoid damage to existing underground pipes. Exercise extreme caution when working near existing electrical conduits and facilities. Field verifies the location of all electrical facilities before proceeding with any nearby work.

C. Refer to Section 00 1600 of these Specifications for all excavation and backfilling work.

3.04 CONCRETE

A. Where shown on the Drawings or specified, provide the required concrete installations for conduit encasement and equipment foundations.

B. Refer to Section 00 2400, Concrete, Grout and Precast Structures, of these Specifications for all concrete work.

3.05 CONDUCTOR IDENTIFICATION

A. Identify all wires and cables in conformance with the requirements of Sections 00 3500. This requirement applies to all equipment provided under this contract, regardless of Division, as well as to all conductors provided or worked on during this contract.

3.06 INSTALLING EQUIPMENT

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Install all floor-mounted equipment on 3-inch-high reinforced concrete pads. The Contractor, suppliers, and fabricators shall take this requirement into consideration when designing, fabricating, and installing panels, motor control centers, and other enclosures so that height above the floor of the operating handles of electrical devices meets the requirements of these Specifications and applicable codes.

3.07 CUTTING, DRILLING, AND WELDING

A. Provide any cutting, drilling, and welding that is required for the electrical construction work.

B. Structural members shall not be cut or drilled, except when favorably reviewed by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.

C. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel.

D. Perform patch work with the same materials as the surrounding area and finish to match.

3.10 FIELD TESTS

A. Give sufficient notice to the Engineer prior to any test to permit witnessing the test.

B. It is the intent of these tests to ensure that all electrical equipment is operational within industry and manufacturer's tolerances and is installed in accordance with the Contract Documents and manufacturer's instructions. The tests and inspections shall determine the suitability for energization.

C. Submit a test report which includes the following:
   1. Name of project, name of person performing test, and date of test
   2. Description of equipment tested

3. Description of test
4. List of test equipment used and calibration date
5. Test results
6. Conclusions and recommendations
7. Appendix, including appropriate test forms

The test report shall be bound and its contents certified. Submit the completed report directly to the Engineer no later than thirty (30) days after completion of the test unless directed otherwise. Number of reports to be submitted for review shall be the same as the number required for shop drawing submittals.

D. Safety practices shall include, but are not limited to, the following requirements:
1. Occupational Safety and Health Act of 1970, OSHA.
2. Accident Prevention Manual for Industrial Operations, Seventh Edition, National Safety Council, Chapter 4.
3. Applicable state and local safety operating procedures.

E. Retesting will be required for all unsatisfactory tests after the equipment or system has been repaired. Retest all related equipment and systems if required by the Engineer. Repair and retest equipment and systems, which have been satisfactorily tested but later, fail, until satisfactory performance is obtained.

F. Putting Equipment and Cables into Service: Submittal and favorable review of the specified factory and field tests shall occur before the Contractor is permitted to place the respective equipment or cable into service.

G. Miscellaneous Tests
1. Insulation Resistance, Continuity, and Rotation: Perform routine insulation resistance, continuity and rotation tests for all distribution and utilization equipment including all motors 1/2 horsepower and larger prior and in addition to tests performed by the testing laboratory specified herein. Supply a suitable and stable source of test power to the test laboratory at each test site. The testing laboratory shall specify requirements. Notify the testing laboratory when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling. All testing shall be performed in the presence of the Engineer. The testing laboratory shall be responsible for implementing all final settings and adjustments on protective devices and tap changes. Any system material or workmanship that is found defective on the basis of acceptance tests shall be reported directly to the Engineer. The testing laboratory shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.
2. Motor Current: Measure and record current in each phase for each new motor. Include measurement of the motor terminal voltages and motor currents when the motor is being operated at normal operating loads. For motors that are part of variable frequency drive systems, use true-RMS-reading instruments in making the measurements.
3. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed, adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation including alarm conditions, and demonstrate satisfactory interfacing with the data acquisition and alarm systems.

3.11 EQUIPMENT PROTECTION

A. Exercise care at all times after installation of equipment, motor control centers, etc., to keep out foreign matter, dust, dirt, debris, or moisture. Use protective sheet metal covers, canvas, heat lamps, etc., as needed to ensure equipment protection.

3.12 CLEANING EQUIPMENT

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

B. Clean out and vacuum all construction debris from the bottom of all equipment.

C. Provide and touch-up to original condition any factory painting that has been marred or scratched during shipment or installation, using paint furnished by the equipment manufacturer.

3.13 CLEANUP

A. Upon completion of the 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 Engineer.

PART 4 - MEASUREMENT AND PAYMENT

Measurement and Payment for electrical item of works are as specified in the following sections.

END OF SECTION 00 3200

SECTION 00 3300 – OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. General

1. Provide a complete arc flash hazard study to help protect individuals working in the facilities from electrical arc flash injuries. These individuals may include any workers who inspect, maintain or operate energized electrical equipment.
2. All references to codes, standards, and published material below apply to latest applicable edition.
3. The study is needed for compliance with the applicable standards for new system installations (California Electrical Code, CEC 110.16) and for worker safety in operating facilities (OSHA 29 CFR 1910, NFPA 70E).
4. Provide Arc Flash Hazard Warning Labels. These labels are intended to assist technicians and others in the selection of proper Personal Protective Equipment when working around exposed and energized conductors.

B. Scope

1. Accurate electrical system single-line diagram as required by NFPA 70E, “Standard for Electrical Safety in the Workplace”, as referenced in OSHA 29 CFR 1910 Subpart S, Appendix A. Include the following on the single line diagram.
   a. Nameplate data for electrical components (e.g. transformers, medium voltage switchgear, panelboards, switchboards, motor control centers, etc.)
   b. Cable sizes, types and lengths between electrical equipment components.
   c. Unique characteristics of the equipment installation which may impact the magnitude of the potential hazard (e.g. open space versus enclosure).
   d. Verified overcurrent device settings.
2. Short Circuit Study in accordance with ANSI standard C37 and IEEE standard 141 (Red Book).
3. Coordination Study in accordance with IEEE 242 “Buff” to determine the proper overcurrent device settings that will balance system reliability through selective coordination while minimizing the magnitude of an electrical arc flash hazard incident.
4. Incident Energy Study in accordance with the IEEE 1584 “IEEE Guide for Performing Arc Flash Hazard Calculations” as referenced in NFPA 70, “Standard for Electrical Safety in the Workplace”, in order to quantify the hazard for selection of personal protective equipment (PPE). Tables that assume fault current levels and clearing time for proper PPE selection are not acceptable.

1.02 SUBMITTALS

A. Comprehensive report that includes:

1. Report summary with analysis methodology, findings and recommendations.

2. Summary of input data for utility source, equipment and cables.

3. Available fault current at each equipment location with comparison to equipment rating.

4. Overcurrent device settings (e.g. pick-up, time delay, curve).

5. Incident energy level (calories/cm2) for each equipment location and recommended PPE.

6. Overcurrent device coordination curves including related section of the single-line diagram.

B. LABELS

1. Installed warning labels (orange <40 cal/cm2) or danger label (red > 40 cal/cm2c) in accordance with ANSI Z535.4. The label must be readable in both indoor and outdoor environments for at least 3 years and contain the following information (see sample label, attached);
   a. Arc hazard boundary (inches).
   b. Working distance (inches).
   c. Arc flash energy at the working distance (calories/cm2).
   d. PPE category with reference to NFPA 70E definitions.
   e. Voltage rating of the equipment.
   f. Limited approach distance (inches).
   g. Restricted approach distance (inches)
   h. Prohibited approach distance (inches)
   i. Equipment/bus name.
   j. Date prepared.

PART 2 - EXECUTION

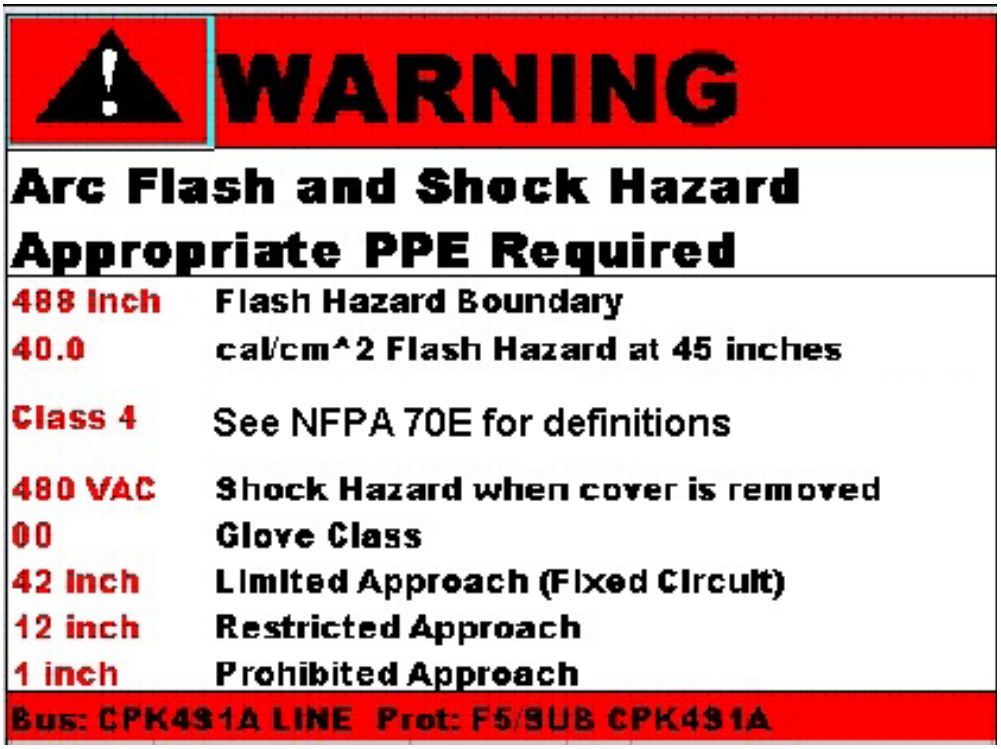
2.01 QUALITY ASSURANCE

1. Provide all necessary material, equipment, labor, and technical supervision to perform the arc flash hazard analysis.

2. Utilize engineers and technicians that are experienced and regularly perform electrical power system testing.

3. Personnel performing the arch flash analysis shall be trained and experienced in accordance with NETA Training Specifications concerning the apparatus and systems being evaluated.

2.02 LABELS: (SAMPLE)



END OF SECTION 00 3300

SECTION 00 3400 – CONDUIT, RACEWAYS, AND FITTINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provisions: Applicable provisions of Section 00 3200 become a part of this Section as if repeated herein.

B. Work specified in other Divisions:
1. Section 00 1600: Earthwork, Excavation and Backfill of Trenches
2. Section 00 2400: Concrete, Grout and Precast Structures

1.02 REFERENCE STANDARDS

A. American National Standards Institute (ANSI) Publications:
1. C80.1 Specification for Zinc Coated Rigid Steel Conduit
2. C80.3 Specifications for Zinc Coated Electrical Metallic Tubing

B. Federal Specifications (FS):
1. FS W-C-1094 W-C-1094A Conduit and Conduit Fittings, Plastic, Rigid
2. FS WW-C-540 WW-C-540A Conduit, Metal, Rigid, (Electrical, Aluminum)
   WW-C-540C Conduit, Metal, Rigid & Coupling, Elbow & Nipple, Electrical Conduit, Aluminum
3. FS WW-C-566 WW-C-566C Flexible Metal Conduit

C. National Electrical Manufacturers Association (NEMA) Publications:
1. RN 1 Polyvinyl Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
2. TC 6 PVC and ABS Plastic Utilities Duct for Underground Installation
3. TC 14 Filament-Wound Reinforced Thermosetting Resin Conduit

D. Underwriters Laboratories (UL) Standards:
1. 6 Rigid Metal Electrical Conduit
2. 360 Liquid-Tight Flexible Steel Electrical Conduit
3. 651 Electrical Rigid Nonmetallic Conduit
4. 651A Type EB and A Rigid PVC Conduit and HDPE Conduit

1.03 SUBMITTALS

A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 00 3200

1.04 LOCATIONS

A. Refer to Section 00 3200 for definitions of types of locations.

PART 2 - PRODUCTS

2.01 CONDUIT, RACEWAYS

A. General:

1. Rigid steel conduit shall be used in all conduit systems, except where otherwise shown on the Drawings, where flexible conduit is required, or where these Specifications require, or allow the use of polyvinyl chloride (PVC) conduit.

2. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.

B. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication, conforming to ANSI C80.1 and UL 6. Couplings shall be threaded type. Where PVC coated rigid steel conduit is called for, it shall be hot-dip galvanized, conforming to NEMA RN 1, with factory-applied PVC coating 40 mils thick.

C. Flexible Conduit:
1. Flexible metal conduit shall be liquid-tight, shall have a moisture- and oil-proof PVC jacket extruded over a galvanized, flexible steel conduit, and shall conform to UL 360.

2. Flexible conduit for hazardous locations shall be UL listed for the applicable Class, Division, and Group.

D. Rigid Nonmetallic Conduit: Rigid nonmetallic conduit shall be PVC Schedule 40 (PVC-40) conduit approved for underground use and for use with 90°C wires, and shall conform to UL 651.

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-dip galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.

C. All channels, strut, threaded rods, nuts and clamps in corrosive areas shall be of epoxy resin reinforced fiberglass material. Provide Robroy, Superstrut, or approved equal.

2.03 FITTINGS

A. Fittings for use with rigid steel shall be hot dipped galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse-Hinds Condulets, Appleton Unilets, or approved equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.

B. Fittings for use with either rigid nonmetallic conduit or duct shall be PVC and have solvent-weld-type conduit connections. If such are not available, then the Specification for PVC coated galvanized rigid steel fittings shall apply.

C. Fittings for flexible conduit shall be Appleton Type ST, O-Z Gedney Series 4Q, or approved equal.

D. Union couplings for conduits shall be the Erickson type and shall be Appleton Type EC, O-Z Gedney 3-piece Series 4, or approved equal. Threadless couplings shall not be used.

E. Bushings:
   1. Bushings shall be the insulated type.
   2. Bushings for rigid steel shall be hot dip galvanized insulated grounding type, 0-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

F. Conduit seals shall have zinc electroplate and shall be Crouse-Hinds Type EYS or EZS; Appleton Type EYS, ESU, or EY series; or approved equal.

2.04 CONDUIT SEALANTS

A. Moisture Barrier Types: Sealant shall be a non-toxic, non-shrink, non-hardening, putty type hand applied material providing an effective barrier under submerged conditions.

2.05 WARNING TAPE

A. Provide electrical warning tape in duct bank as shown on the Drawings. The tape shall be 6 inches wide, red with black lettering stating "CAUTION BURIED ELECTRIC LINE." The tape shall be made of 6-mil polymer with 36,000 psi tensile strength.

PART 3 - EXECUTION

3.01 CONDUIT, RACEWAY AND FITTING INSTALLATION

A. From pull point to pull point, the sum of the angles of all of the bends and offsets shall not exceed 270 degrees.

B. For power, control and signal circuits, provide conduit per Conduit Use Tables below, unless specifically indicated otherwise on the Drawings:
   1. Exception: For raceways leaving a building above grade and then going below grade, provide PVC-coated GRS from a point 3 feet above grade to a point 5 feet from the building wall.

C. At all boxes and equipment, provide insulated type metallic grounding bushings for metallic conduits. Bond together all conduits to provide continuity of the equipment grounding system. Size bonding conductor per code.

D. Provide flexible conduit in lengths of not more than 18 inches at connections to motors, valves and any equipment subject to vibration or relative movement.

E. Conduits embedded in concrete floors on grade shall be installed between grids of reinforcing steel, or shall be encased below the floors, provided the concrete is thickened in a manner satisfactory to the Engineer. Installation of conduit below the bottom of this slab is not acceptable; embedding or encasing is required.

F. Provide galvanized rigid steel factory ells for GRS raceways. Provide GRS for offsets in both GRS raceways.

G. Underground Raceways: Where possible, slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the handhole located outside the building.

I. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits exposed except where the Drawings indicate that they are to be embedded in the floor slab, walls, or ceiling, or to be installed underground.
   1. Exposed Conduits:
   a. Support exposed conduits within 1 foot of any outlet 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. Coordinate conduit locations with piping, equipment, fixtures, and with structural and architectural elements. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel to building lines.
   b. Group together exposed conduits in horizontal runs located away from walls and support on trapeze hangers. Arrange such conduits uniformly and neatly. Trapeze hangers shall consist of channels of adequate size, suspended by means of rods or other suitable means from the ceiling or from pipe hangers. Install such runs so as not to interfere with the operation of valves or any other equipment, and keep at least 6 inches clear of any pipe which may operate at more than 100°F. Treat cut surfaces or damaged ends with corrosion-resistant coatings such as "Devcon Z", prepared by Subox Coatings; "Galvanox Type I", prepared by Pedley-Knowles; or approved equal. Application shall follow manufacturer's recommendation.
   2. Conduits Embedded in Concrete: Provide concrete cover at least equal to that of the reinforcing steel, space at 3 conduit diameters apart except where they cross at angles greater than 45 degrees, and install so as not to reduce the structural integrity of the concrete element.

J. When expansion joints are crossed, whether conduit is embedded or exposed, provide watertight expansion fittings and bonding jumpers. In hazardous locations, provide Crouse-Hinds UNF/UNV, Appleton, or equal. In unclassified locations, provide Crouse-Hinds XD, Appleton, or equal.

K. Spare Raceways: After completing a conduit run between manholes, handholes, or pullboxes, prove the integrity of the conduit run. Use an air compressor to blow in a pull-line, then use the pull-line to pull a mandrel through the entire conduit run. Install a new 3/16-inch nylon, 800 pound test pull-line which has tape measure marking every foot to indicate length. Plug the ends of the conduit, with conduit cap plugs.

M. All conduit penetrations through interior walls and floors shall be sealed with fire retardant type conduit sealant.

N. Conduit Identification: In each manhole, handhole, pullbox, cabinet, motor control center or other equipment enclosure, identify each conduit using the conduit number shown on the Drawings by means of a stamped brass tag affixed with stainless steel wire; where affixing a tag is not feasible, identify conduits by stenciling. Stencil all exposed conduits for identification at least once in each room.

O. Conduit Seals:
   1. Moisture Seals: Provide in accordance with NEC Paragraph 300-5(g).
   2. Gas Seals: Provide in accordance with NEC Paragraph 501-5.

Q. Conduit in finished areas shall be installed concealed.

R. Conduit shall not be supported from T-bar ceiling suspension wires.

S. Flexible metallic conduit shall have a maximum length of 6 feet. Flexible metallic conduit shall not be considered as a ground conductor. Flexible metallic conduit shall only be installed in exposed or accessible locations.

T. Rigid PVC conduit shall be stored on a flat surface and shielded from the sun.

CONDUIT USE TABLE

Circuit Type	Exposed	Embedded in Concrete or Slab on Grade	Underground Duct Bank Encased In Concrete or Direct Buried	Underground Structures
Power & 120 Vac Control	PVC Coated GRS	GRS	PVC-40	PVC Coated GRS
Signal	PVC Coated GRS	GRS	PVC-40	PVC Coated GRS

* Provide ground wire sized per NEC requirements for all circuits.

Notes:
1. Generally, the Conduit Use Tables apply.
2. Signal circuits are those subject to RF interference or induced current. MSPs, TSPs, telephone cable, coaxial cable, and manufacturer's cables specially designed for low level signals are all presumed to be part of signal circuits.
3. Provide fiberglass conduit where indicated on the Drawings.

END OF SECTION 00 3400

SECTION 00 3500 – LOW VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provisions: Applicable provisions of Section 00 3200 become a part of this Section as if repeated herein.

B. Related Work Described Elsewhere: Section 00 4100.

1.02 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):
1. B3-74 Specification for Soft or Annealed Copper Wire
2. B8-77 Specification for Concentric Lay Stranded Copper Conductors, Hard, Medium-Hard, or Soft
3. B173-71 Specification for Rope Lay Stranded Copper Conductors Having Concentric Stranded Members

B. Insulated Cable Engineers Association (ICEA):
1. S-66-524 Cross-Linked Thermosetting Polyethylene Insulated Wire and Cable

C. International Electrical Testing Association (NETA);
1. ATS
Acceptance Testing Specifications

D. Underwriters Laboratories (UL) Standards:
1. 44 Rubber Insulated Wire and Cable
2. 62 Flexible Cords and Fixture Wire
3. 83 Thermoplastic-Insulated Wires and Cables
4. 510 Insulating Tape
5. 719 Non-Metallic Sheath Cable
6. 1063 Stranded Conductors for Machine Tool Wire

1.03 SUBMITTALS

A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 00 3200.

1.04 LOCATIONS

A. Refer to Section 00 3200 for definitions of types of locations.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. General: All conductors shall be copper. 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 in conformance with the applicable code. All insulated conductors shall be identified with printing colored to contrast with the insulation color.

B. Power and Control Conductors, 600 Volts and Below:
1. Stranded copper wires shall be 600 volt Type THWN, sizes #12 and #10 AWG only.
2. Stranded copper wire shall be 600 volt Type THWN, Class B stranding, sizes #14 AWG and larger.

2.02 SPLICES AND TERMINATIONS OF CONDUCTORS

A. Splices:
1. Wire and Cable Splicing Materials and Applications:
a. For Lighting Systems and Power Outlets: Wire nuts shall be twist-on type insulated connectors utilizing an outer insulating cover and a means for connecting and holding the conductors firmly. They shall be UL listed and suitable for connecting two to four solid copper conductors of #14 or #12 AWG size or two or three #10 AWG solid copper conductors.
b. All Equipment: Crimp type connectors shall be insulated type, suitable for the size and material of the wires and the number of wires to be spliced and for use with either solid or stranded conductors. They shall be UL listed.
c. Division 16 Equipment and Power Conductors: Bolted pressure connectors shall be suitable for the size and material of the conductors to be spliced. They shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor.
d. All Equipment: Epoxy splice kits shall include epoxy resin, hardener, and mold, and shall be suitable for use in wet locations and hazardous locations.

B. Terminations:
1. Low Voltage Terminations:
a. Crimp type terminals shall be UL listed, self-insulating sleeve type, with ring or rectangular type tongue, suitable for the size and material of the wire to be terminated, and for use with either solid or stranded conductors.
b. Terminal lugs shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor. Tongues shall have NEMA standard drilling.
c. Crimp with manufacturer recommended ratchet-type tool with calibrated dies. Hand crimping tools are not acceptable.

C. Tape used for splices and terminations shall be compatible with the insulation and jacket of the cable and shall be of plastic material. Tape shall conform with UL 510.

D. Wire markers shall be heat shrink type (Raychem; T&B; or approved equal) or plastic sleeve type. Wire numbers shall be permanently imprinted on the markers.

PART 3 - EXECUTION

3.01 CONDUCTOR INSTALLATION

A. Provide the following types and sizes of conductors for the uses indicated for 600 volts or less:
1. Stranded Copper, Sizes #12 and #10 AWG: As shown on the Drawings for circuits for receptacles, switches and light fixtures with screw-type terminals.
2. Stranded Copper, Size #14 AWG and Larger, Individual Conductors or CC: As shown on the Drawings for the control of motors or other equipment. Size #14 shall not be used for power supplies to any equipment.

3. Stranded Copper, Sizes #12 AWG and Larger: As shown on the drawings for motors and other power circuits.

B. Color Coding: Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. An isolated ground conductor shall be identified with an orange tracer in the green body. Ungrounded conductor colors shall be as follows:
   1. 120/208 Volt, 3 Phase: Red, black and blue.
   2. 277/480 Volt, 3 Phase: Yellow, brown and orange.
   3. 120/240 Volt, 1 Phase: Red and black.

C. 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 (e.g., enclosures, pull boxes, and junction boxes).

D. Exercise care in pulling wires and cables into conduit or wire ways 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.

E. Wrap all cables in manholes with fireproofing tape. Extend tape 1-inch into ducts.

F. Cable bending radius shall be per applicable code. Install feeder cables in one continuous length unless splices are favorably reviewed.

G. Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in any flexible conduit or any raceway in which all or any portion of a run consists of non-metallic duct or conduit. For flexible conduit, an external bonding jumper is an acceptable alternative.

H. In panels, bundle incoming wire and cables, 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.

I. For cables crossing hinges, utilize extra flexible stranded wire, make up into groups not exceeding 12, and arrange so that they will be protected from chafing and excess flexing when the hinged member is moved.

3.02 CONDUCTOR SPLICES AND TERMINATIONS

A. Splices: Install all conductors without splices unless necessary for installation, as determined by the Engineer. Splices, when permitted and terminations shall be in accordance with the splice or termination kit manufacturer's instructions. Splice or terminate wire and cable as follows:
   1. Watertight Splices: Splices in concrete pull boxes, for any type of cable or wire, shall be watertight. Make splices in low voltage cables using epoxy resin splicing kits rated for application up to 600 volts.

B. Terminations: Terminate stranded #14 wire using crimp type terminals where not terminated in a box lug type terminal. Terminals must be coordinated with type of terminal board where provided.

3.03 CONDUCTOR IDENTIFICATION

A. Except for interior lighting and receptacle circuits, identify each wire or cable at each termination and in each pull box, junction box, hand hole, and manhole using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit terminal number. Identify other circuits as shown in the circuit schedule or as favorably reviewed by the Engineer.

B. Conductor numbering shall be coordinated with the Interconnection Diagrams specified in Section 00 4100.

C. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

3.04 FIELD TESTS

A. Insulation Resistance Tests: For all circuits 150 volts to ground or more and for all motor circuits over 1/2 horsepower, test cables per NETA Paragraph 8.3.1. The insulation resistance shall be 20 mega ohms or more. Submit results for review. See also Section 16010.

B. Phase Rotation: The phase rotation of all circuits shall be clockwise in sequence. The Contractor shall verify that each three-phase service, feeder and branch circuits meet this requirement. A record shall be kept at each circuit tested and, on completion, given to the Engineer for review.

END OF SECTION 00 3500

SECTION 00 3600 – BOXES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provisions: Applicable provisions of Section 00 3200 become part of this Section as if repeated herein.

B. Work Included:
1. Installation of all necessary outlet boxes for wiring devices, lighting fixtures, and signal equipment as noted on the Drawings.
2. Installation of junction boxes as required for the consolidation of conduit runs.
3. Installation of pull boxes as necessary to aid in pulling in conductor.

1.02 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM) Publication:
1. A123 Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products

B. Federal Specifications (FS):
1. W-C-586 Conduit Outlet Boxes, Bodies, and Entrance Caps, Electrical, Cast Metal
2. W-J-800 Junction Box, Extension, Junction Box Cover, Junction Box (Steel, Cadmium or Zinc Coated)

C. Underwriters Laboratories, Inc. (UL) Publications:
1. 50 Electrical Cabinets and Boxes
2. 514 Outlet Boxes and Fittings

1.03 SUBMITTALS

A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 00 3200.

PART 2 - PRODUCTS

2.01 OUTLET, JUNCTION AND PULL BOXES

A. Sheet Metal Boxes: Sheet metal boxes shall conform to UL 50, with a hot-dipped galvanized finish conforming to ASTM A123. Outlet boxes and switch boxes shall be designed for mounting flush wiring devices. Boxes and box extension rings shall be provided with knockouts. Boxes shall be formed in one piece from carbon-steel sheets. Outlet boxes shall not be less than 4 inches square and 1-1/2 inches deep. Ceiling boxes shall withstand a vertical force of 200 pounds for 5 minutes. Wall boxes shall withstand a vertical downward force of 50 pounds for 5 minutes. Gangable and through-wall types are not acceptable. Boxes shall conform to FS W-J-800D and UL 514.

B. Cast Metal Boxes: Box bodies and cover shall be cast or malleable iron with a minimum wall thickness of 1/8-inch at every point, and not less than 1/4-inch at tapped holes for rigid conduit. Bosses are not acceptable. Mounting lugs shall be provided at

the back or bottom corners of the body. Covers shall be secured to the box body with No. 6 or larger brass or bronze flathead screws. Boxes shall be provided with neoprene cover gaskets. Where only cast aluminum is available for certain types of fixture boxes, an epoxy finish shall be provided. Outlet boxes shall be of the FS types. Boxes shall conform to FS W-C-586C and UL 514.

C. Non-metallic Boxes: Non-metallic boxes shall be hot-compressed fiberglass, one-piece, molded with reinforcing of polyester material, with minimum wall thickness of 1/8-inch.

D. Pull Boxes and Junction Boxes: Except where NEMA 4X fiberglass boxes are called for, all boxes shall be fabricated from carbon steel per UL 50. Boxes shall be welded construction with all seams or joints closed and reinforced. Boxes shall be galvanized after construction. Boxes intended for outdoor use shall be cast metal with threaded hubs and neoprene gasketed covers, or shall be of the fiberglass reinforced polyester type of 1/8-inch minimum thickness. Cover retention shall be by corrosion resistant stainless steel screws.
   1. All boxes for wiring operating at 601 volts or higher shall be constructed without hinges and shall be pad lockable.
   2. All boxes and cabinets shall be securely fastened to building structural members so as to prevent movement in any direction. Boxes shall not be supported by lighting fixtures, suspended ceiling support wires or freely hanging rods.
      a. Covers of boxes and cabinets mounted in horizontal plane (top or bottom) shall either weigh not more than 40 pounds or shall require not more than 40 pounds of force to open or close.
      b. Covers of boxes and cabinets mounted in vertical plane (front, back, sides) shall either weigh not more than 60 pounds or shall require not more than 60 pounds of force to open or close. All covers over 30 pounds shall be furnished with angle support at bottom to carry weight of cover for assembly.
      c. Covers of boxes and cabinets weighing more than 30 pounds shall be provided with lifting handles or some means of grasping other than edges.

E. Precast Pull Boxes: Precast concrete pull boxes shall be provided as shown on the Drawings and shall be Christy or approved equal. Provide precast concrete extensions as required. Covers shall be precast concrete marked to identify the service as indicated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Outlet Boxes:
   1. Provide fixture outlets with proper fixture connectors.
   2. Box mounting height shall be dictated by the wiring device enclosed.
   3. Blanking covers shall be installed on all unused openings.
   4. Sheet metal boxes shall be used in dry non-corrosive locations where the conduit system is routed concealed in the walls and ceilings.
   5. Cast metal or molded non-metallic surface mounted boxes shall be used in exterior and/or in all wet locations.
   6. Bonding jumpers shall be used around all concentric or eccentric knockouts.
   7. Boxes shall be securely mounted to the building structure independent of conduits entering or exiting the boxes.

B. Junction Boxes and Pull Boxes:

1. Boxes shall be installed where required and where indicated on the Drawings.
2. Boxes shall be readily accessible.
3. Boxes shall not be installed in finished areas.
4. Pull boxes shall be provided at least every 150 feet on long straight conduit runs. Spacing shall be reduced by 50 feet for each 90 degree bend. See Section 16110 for maximum bends in conduit systems.
5. Box dimensions shall be in accordance with size and quantity of conductors and conduits entering and leaving box per NEC Article 370 requirements.

C. Precast concrete pull boxes shall be installed in excavations as shown on the Drawings and as required. Precast concrete pull boxes and manhole installation shall conform to the following requirements:
   1. Pull box shall be placed on six inches, minimum, of crushed rock or compacted sand.
   2. Ground conductor shall be looped around the entire circumference of the pull box. Install above all insulated cables.
   3. Covers shall be installed on all pull boxes.
   4. Precast pull boxes shall be installed level and flush with surrounding surfacing in paved areas and 1-1/2 inch above final grade in unpaved areas.

END OF SECTION 00 3600

SECTION 00 3700 – ELECTRICAL SERVICE CONTROL CABINET

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Work under this section includes products, assemblies and basic installation methods required for electrical projects systems specified herein but shall not be limited to the following:
   1. Meter and Electrical Service/Control Cabinet
   2. Circuit Breakers
   3. Transformers

B. Related Sections:
   1. Section 00 2400 – Concrete, Grout, and Precast Structures
   2. Section 00 3200 – General Electrical Requirements
   3. Section 00 3300 – Overcurrent Protective Device Coordination Study
   4. Section 00 4100 – Instrumentation and Controls

1.02 SUBMITTALS:

A. Submit in conformance with the requirements of Section 00 3200 the following items:
   1. Self-contained Meter and Cabinet
   2. Panelboard

1.03 SERVICE VOLTAGES:

A. Service equipment: 120/208 volts, 3 phase, 4 wire WYE.

PART 2 - PRODUCTS

2.01 ELECTRICAL SERVICE/CONTROL CABINET

A. General:
   1. Cabinet shall meet the enclosure requirements established by U. L. for dead front cabinets and shall be furnished with a U. L. label and shall meet the requirements of the local utility company as service entrance equipment. Each section shall utilize conventional distribution switchboard construction consisting of formed vertical posts and angle cross members for a rigid self-supporting framework to support the bussing, devices and covers. The side, rear, and front covers shall be of code gauge steel and sectionalized for easy removal and handling. Covers on unmetered compartments are provided with sealing screws or studs. Ground bus shall be provided as standard. Maximum height of the cabinet shall be 70 inches.
   2. Provisions shall be made for devices as noted on the drawings.
   3. Shall be as manufactured by EDCCO, TESCO or approved equal.

B. Enclosure

   1. Dead-front with front accessibility. Framework fabricated of code-gauge steel members rigidly welded together to support cover plates, bussing, and component devices, and with open bottom and individual removable top plates for installation and termination of conduit. The incoming conduit is to

be for underground service unless otherwise noted on the plans

2. Hinge wire way front covers for easy access to the load side terminals.
3. Finish enclosure medium light gray color, ANSI #49, applied by the electrodeposition process over an iron phosphate pre-treatment.
4. NEMA 3R rated.

C. Bussing

1. Buses shall be of sufficient cross-sectional area to meet UL Standard 891 on temperature rise. Through bus shall be extruded aluminum plated with Alstan 70 or 80 process, rated as indicated, and shall be braced to have a short circuit current as indicated. Aluminum bus connections shall be made with Belleville washers. The short circuit rating of the bus shall have a minimum rating of 50,000 RMS symmetrical amps unless otherwise noted on the drawings.

D. Automatic Transfer Switch (see section 16495)

E. Self-Contained Meter and Main Breaker. Attached to the exterior of the cabinet or integrated with the cabinet (as long as the footprint stays within the allowed dimensions on the plans) the self-contained meter shall have a seven jaw meter socket with a 200 amp rated breaker as noted on the plans. The AIC ratings shall be as coordinated with the local utility company. The enclosure shall be rated NEMA 3R.

F. Soft Starter

2.02. CIRCUIT BREAKERS

A. Manufacturer: General Electric, Square – D, Cutler Hammer, Siemens, or approved equal.

B. Overcurrent Devices; Molded case, thermal magnetic circuit breakers 40 degrees Celsius, ambient compensated as specified under Section 00 3200.

C. Terminal Lugs: Approval for use with copper conductors.

D. Additional Features: Refer to single line diagram for the following:

Number and type of circuit breakers
Bus ampacity and arrangements
Terminal lug size and location
Interrupting capacity
Service voltage
Mounting arrangement

G. Standards: shall be designed to meet the following applicable industry standards:
1. Underwriters' Laboratories - UL67, UL50
2. NEMA PB1
3. National Electrical Code

PART 3 – EXECUTION

3.01 ELECTRICAL SERVICE/CONTROL CABINET AND CONTROL PANEL:

B. Set cabinets plumb and symmetrical with building lines.

B. Free-standing cabinets and distribution panels, should be accurately aligned, leveled and bolted in place on integral full-length channels securely fastened to the concrete support pad.

C. "Train" interior wiring: Bundle and clamp using specified plastic wire wraps.

D. Touch-up paints any marks, blemishes, or other damaged finish suffered during installation.

E. Replace cabinets, doors or trim exhibition dents, bends, warps or poor fit which may impede ready access, security or integrity.

F. Install nameplates, legend plates, and panel directories, as specified under Section 16010.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Electrical Service/Cabinet Control will be measured for payment as lump sum.

B. Conduit and Wire will be measured for payment as lump sum.

C. Instrument and Control System will be measured for payment as lump sum.

D. Electrical Startup will be measured for payment as lump sum.

4.2 PAYMENT

A. The contract lump price paid for electrical service/cabinet control panel shall include all materials, labor, equipment and related work items to install electrical service and control cabinet with automatic transfer switch. complete in place, as shown on the plans and as directed by the Engineer.

B. The contract lump price paid for conduit and wire shall include all materials, labor, equipment and related work items to install conduit and wire, including but not limited to pull boxes, ropes, grounding, and other appurtenances, complete in place, as shown on the plans and as directed by the Engineer.

C. The contract lump price paid for instrument and control system shall include all materials, labor, equipment and related work items to install electrical instrument and control system, complete in place in operable condition, as shown on the plans and as directed by the Engineer.

D. The contract lump price paid for electrical startup shall include all materials, labor, equipment and related work items for electrical startup, including but not limited to

power and communication hookup and testing, complete in place, as shown on the plans and as directed by the Engineer.

END OF SECTION 00 3700

SECTION 00 3800 – STANDBY ENGINE GENERATOR

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions: Applicable provisions of Sections 00 3200 become a part of this Section as if repeated herein.

B. Work Included: Furnish all labor, materials, equipment, services and incidentals required to provide a complete and operable standby diesel engine-generator system. Materials and equipment shall be new and of best quality, as specified and shown on the Drawings. The work shall include, but not be limited to:
   1. Standby diesel engine-generator set (hereinafter called engine-generator) complete with all appurtenances. Unit shall be complete with all standard accessories for the manufacturers and models listed in Paragraph 2.01H in addition to those additional and special features described.
   2. Fuel system including sub-base double-wall tank assembly, fuel piping from tank to engine, and engine-mounted fuel pump.
   3. Automatic starting and shutdown controls, starting batteries, battery rack, charger, and generator controls.
   4. Weatherproof/soundproof enclosure including exhaust system complete with flexible connectors, critical silencer, exhaust piping, insulation, rain cap, and mechanical support systems.
   5. The Contractor shall obtain an Authority-to-Construct permit for the engine-generator from the Bay Area Air Quality Management District; 939 Ellis Street, San Francisco, CA 94109; (415) 771-6000.
   6. Insulated Fire-Resistant Metal Wall Panels

C. Related Work Specified in Other Sections:
   1. Section 00 1600: Earthwork, Excavation and Backfill
   2. Section 00 2400: Concrete, Grout and Precast Structures
   3. Section 00 4300 – Insulated Fire-Resistant Metal Wall Panels

1.02 QUALITY ASSURANCE

A. Comply with all rules and regulations of authorities having jurisdiction over work specified herein.

B. Permits and inspection shall be in accordance with the Standard Specifications and Division 1 of this Specification.

C. The Drawings are diagrammatic. Size of equipment and pipes and general method of routing are shown, but it is not intended to show every offset and fitting nor every structural difficulty that may be encountered.

1.03 REFERENCE STANDARDS:

A. American Society for Testing and Materials (ASTM) Publication:
   A123 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

B. Federal Specification (FS): FF-H-106C, Hardware, Builders Locks and Door Trim

C. National Electrical Manufacturers Association (NEMA) Publications:
   ICS-1 General Standards for Industrial Controls and Systems
   ICS-2 Standards for Industrial Control Devices, Controllers and Assemblies
   ICS-6 Enclosures for Industrial Controls and Systems MG 1, Motors and Generators

D. National Fire Protection Association (NFPA) Publications:
   30 Flammable and Combustible Liquid Code
   37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
   110 Emergency and Standby Power Systems

E. Underwriters Laboratory (UL) Standard: 508, Electric Industrial Control Equipment

1.04 SUBMITTALS

A. Submit material or equipment data in accordance with the Product Review category and the submittal requirements of Section 00 3200.

B. Shop Drawings: Submit shop drawings and include the following information:
   1. Plan layout drawings for the engine-generator, with location dimensions for all connections including electrical, fuel, and exhaust, with base dimensions and weights.
   2. Composite assembly drawing of engine-generator showing location of all auxiliary equipment.
   3. Front, rear, and both side elevations of the complete engine-generator unit assembly, including fuel tank.
   4. Specification sheets with performance data and engineering details adequate to determine compliance with Specifications of:
      a. Engine (including engine cranking amperes at 20°F)
      b. Radiator
      c. Generator and voltage regulator
      d. Base assembly, housing, and vibration isolation mounts
      e. Control panel with all components
      f. Jacket water heater
      g. Double wall sub-base fuel tank assembly
      h. Engine-mounted fuel pump
      i. Governor
      j. Battery system
      k. Exhaust system including piping, critical silencer, hanging/support systems, flexible exhaust connections, and rain cap
      l. Battery charger
      m. Alarms
   5. Electrical interconnection diagram including generator, voltage regulator, control panel, circuit breaker, batteries, jacket heater, switches and accessories.
   6. Electrical interconnection and elementary diagrams for control panel.
   7. Complete identification of all components and materials by manufacturer, model number, rating and material.
   8. Complete engine and generator voltage dip and load data. Provide calculations to show compliance with specified performance requirements specifically prepared for this project.
   9. Single-line generator power diagrams.
   10. Wiring diagrams for generator excitation and regulation circuits, alarm circuits, and instrument circuits.

11. Elementary control diagram and separate wiring diagram for automatic engine starting and protective shutdown controls. These diagrams shall show a wire number for every control circuit wire. Include a comprehensive description of operation.
12. Electrical diagrams and interconnection diagrams.
13. Complete surface preparation and finish data for the engine, generator, cabinet, panels, frame, housing, and other surfaces.
14. Detailed description of factory testing program, testing equipment, reporting procedure, and criteria for test passing or failing.
15. Detailed description of field testing program, including description of tests, testing equipment, reporting procedure, and criteria for test passing or failing. (This may be a separate submittal made at a later time, but not later than 30 days before the actual tests.)
16. Provide a sketch or description of the anchorage system.
17. Check the shop drawing submittal to verify that all the details and data required above are included. If the submittal is not complete, it cannot be favorably reviewed and will be returned for completion.

C. Factory Test Report: After fabrication and testing but before shipping from the factory, submit results of the factory test for review. Do not ship any generator units until the factory test results have received favorable review.

D. Field Test Report: Submit field test report for review within 15 days of the time of completion of the field test.

E. Operations and Maintenance Manual: Provide in conformance with Section 00 3200.

PART 2 - PRODUCTS

2.01 ENGINE-GENERATOR SET

A. General:
1. The engine-generator shall be a factory fabricated and assembled package of new and current equipment, and shall consist of engine, generator, controls, and other accessories as specified and as may be required for a complete and operable assembly, capable of automatic startup and shutdown. Elevation of installation is approximately 20 feet above sea level with ambient conditions between 25° F and 100° F.
2. The engine-generator shall have only one source of supply and responsibility. The assembly and complete installation shall comply with the National Electrical Code and Title 8 of the California Administrative Code (CAL/OSHA).
3. Install the engine-generator permanently on a welded steel base for anchorage to a double wall generator base tank that can be anchored to a concrete base.

B. Ratings and Performance: The unit shall be capable of providing power for motors, lighting, and controls.
1. The engine-generator shall be capable of starting and operating the sequentially started loads as follows:
a. With an initial load (listed in Paragraph 2.01.H) on the generator unit, the engine-generator shall be capable of starting and running the additional electrical load as listed in Paragraph 2.01.H. The instantaneous voltage dip shall not exceed 20%.
b. The generator will not be required to parallel any other source.
c. The generator shall provide the voltage, phase and number of wires as listed in Paragraph 2.01.H. The engine-generator speed shall not exceed that listed

in Paragraph 2.01.H. Submit detailed calculations on voltage dip characteristics on this specific application. Generalized catalogs are not sufficient to meet this requirement. The voltage dip characteristics shall also be confirmed in the field. Failure of this field test shall constitute evidence that the equipment has not met the voltage dip criterion. The equipment shall be replaced or modified until the installed equipment operates successfully as specified herein. (See the Paragraph entitled "Testing and Run-In.") Under no circumstances will equipment with a voltage dip greater than specified be acceptable.

C. Engine:
1. Type: The engine shall be designed for operation with No. 2 diesel fuel. The engine brake horsepower rating shall be adequately sized for motors shown in paragraph 2.01.H, including starting loads, as well as lighting and control loads.
   a. Emissions: The engine shall meet the Bay Area Air Quality Management District (BAAQMD) emission standards, with unit emissions below all threshold levels to meet EPA Tier 3 (non-road) and CARB requirements.
   b. Cooling System: The engine cooling system shall incorporate an air-cooled radiator, affixed to the unit with pusher-type fan, driven by the engine shaft. An engine-driven water cooling pump shall circulate coolant through the cooling water loop.
   c. Speed Control: Provide engine speed isochronous electric governor to control engine speed within 0.25% from no load to full rated output.
2. Control Panel:
   a. Top of the Control panel shall be mounted no higher than 6 feet above the floor.
   b. General: Provide an engine-generator set controller, meeting NFPA 110, Level 2 requirements. Controller shall incorporate the following features:
   c. Engine Start System: Provide a complete automatic engine start-stop control, which shall start engine on closing remote contact and initiate engine cool down and shutdown on opening contact. The engine controls shall also include a three-position selector switch with the following positions: RUN/STOP/AUTOMATIC; the STOP position shall shut the engine down immediately, bypassing the cool down cycle.
   d. Alternator Monitoring: The alternator control panel shall be wired, tested, and shock mounted on the engine-generator set by the manufacturer. It shall contain panel lighting, manual reset circuit breaker, frequency meter, running time meter, voltage adjusting rheostat, ac voltmeter, ac ammeter (which indicates current each phase), and voltmeter-ammeter phase selector switch with OFF position. Frequency meter, ammeter, and voltmeter shall be 250-degree circular switchboard type, 1% accuracy class.
   e. Safety Shutdowns: Provide a cranking limiter to open the starting circuit in approximately 45 to 60 seconds if the engine fails to start in that time. Provide sensing elements to shut the engine down immediately when conditions reach a level deemed harmful to the unit. Provide an individual signal light and alarm terminals for each condition. Provide an alarm relay and horn. Safety shutdowns shall include:
      1) Low lubricating oil pressure
      2) High engine (water) temperature
      3) Over speed
      4) Over crank
      5) Any additional conditions standard with the manufacturer
   f. Alarm Outputs: Provide one set of Form C contacts for connections to the Plant's SCADA system as noted below. The contacts shall be actuated for

any one or more of the shutdown conditions or for overcurrent trip of the generator main breaker; provide alarm signal light for such overcurrent trip. The contacts shall remain activated during the entire period of the abnormal condition, and reset shall be automatic. The contacts shall be wired to a terminal strip inside a closed, gasketed box.

1) Composite Generator Alarm (low priority)
2) Composite Generator Alarm (high priority)
3) Fuel Leak
4) Engine Running

3. Batteries: Provide starting batteries mounted in attached battery racks with non-conducting floor. Guarantee the batteries for one year or more and provide a new battery for any battery found defective within the guarantee period. Mount batteries above the concrete floor level. Batteries shall be the lead acid type, selected to provide engine break-away current for one second at a battery temperature of 25°F and to provide cranking as specified in Paragraph 2.01.C.2 above. Engine shall be at the temperature maintained by the jacket heater (see paragraph 2.01.C.6) under 25°F ambient condition.
4. Battery Charger: Provide a charger of the two-rate type, with current and voltage ratings to suit the batteries. Include a dc ammeter, fused ac input and dc output, and charge rate selector switch. The charger shall operate on 120-volt, single-phase. Charger output shall be current limited to 140% of rated current.
5. Provide an exhaust silencer of the critical silencing type capable of not less than 30 dB-A attenuation, sized by the engine manufacturer to provide silencing without harmful back-pressure.
6. Jacket Water Heater: Provide single-phase jacket water heater(s) with one thermostat. Size heater to maintain an 80°F water temperature in a 25°F ambient air temperature environment. Heaters shall be 120 volts, single-phase. Provide panelboard circuit breaker and wiring to match the heater.
7. Initial Fills:
   a. Provide crankcase oil.
   b. Provide initial fill of engine coolant as recommended by the manufacturer to protect engine-cooling system to a minimum temperature of 20°F, and as required to inhibit corrosion in the cooling system.
   c. Fuel Oil: Supply the fuel oil for operation testing.

D. Generator:
1. The generator shall be four-pole and of revolving field design with temperature-compensated solid-state voltage regulator and high speed brushless rotating rectifier exciter system. The stator shall be directly connected to the engine flywheel housing and rotor shall be driven through semi-flexible driving flanges to ensure permanent alignments. The insulation system shall be Class F with Class B temperature rise. The three-phase generator shall meet the requirements of NEMA Standard MG-1.
2. Generator Performance:
   a. Frequency regulation shall be iso-synchronous ±0.25% from no-load to rated load.
   b. Steady-state voltage regulation shall be within ±2% of rated voltage, from no-load to full rated load. Rheostats shall provide a minimum of ±5% voltage adjustment from rated value. Voltage regulator shall be of the silicon controlled rectifier type.
   c. The unit shall be compatible with adjustable frequency drive controllers. The maximum allowable short-term voltage dip, as measured at the controllers,

shall not cause the voltage to drop below the minimum line voltage specified in Section 16924. Provide a suitable noise filter for the exciter, and derate the generator, as required, to accommodate harmonic heating. Preload and step load conditions are tabulated in Paragraph 2.01.H.

3. Generator Main Power Circuit Breaker: Main power circuit breaker shall be molded case, 3-pole, 208-volt, 42,000-amp interrupting capacity, sized as shown on the Drawings. The breaker shall be housed within the engine-generator enclosure. Breaker shall be quick-make, quick-break type, with wiping contacts and arc chutes for each pole. Breaker shall be trip-free and have trip indication independent of on-off positions. Breaker lugs shall be front accessible and shall be UL-listed for either copper or aluminum cables.

E. Weatherproof/Sound Enclosure: The unit will be housed inside a weatherproof, sound-insulated, heavy gauge steel enclosure. The enclosure shall include the following accessories and meet the following requirements:

1. The enclosure shall be insulated with sound-absorbing material to reduce the overall general noise level to less that 70 dBA as measured in eight locations at 45 degree increments around a circle of 23 foot radius centered on the middle of the enclosure. Microphone height shall be between 3 and 5 feet from the ground. Enclosure shall be tested with exhaust muffler in place, see item 4 below. Sound absorbing material shall be mechanically secured to the inside of the enclosure at a sufficient number of locations to prevent sagging or failure of the material due to age, water damage, or normal use.
2. Air intake louver(s) sized to exceed the minimum cooling air intake requirements of the generator set ratings through operation of the generator set exhaust fan.
3. A minimum of one access door shall be provided on each side and each end of the enclosure, for access to control panel and other maintenance points on the unit. The doors shall have stainless steel lockable latches and door stops. Doors shall be removable.
4. Exhaust silencer shall be installed within enclosure. Coordinate sound attenuation design shall be as specified in paragraph 2.01.C.5. Provide rain cap for exhaust outlet.
5. Access for filling of the engine radiator shall be provided at the top of the enclosure.
6. Coating system shall be as follows:
   a. Primer: Shop prime with zinc-rich, rust-inhibiting primer at 3.5 DFT mils; SSPC-SP6 surface preparation.
   b. Second coat: Epoxy coat, 3.0 DFT mils exterior, 6.0 DFT mils interior
   c. Finish coat: Polyurethane, 3.0 DFT mils exterior only.
   d. Total DFT mils: Exterior 9.5 mils, Interior 9.5 mils
   e. Color to be selected by Engineer

F. Fuel Tank Assembly: The fuel system shall consist of a sub-base mounted fuel tank, double-wall (rupture basin), and shall include the following:

1. A nominal 130-gallon capacity, UL listed, double-walled steel tank mounted underneath the unit. Fuel tank shall provide a minimum 24-hour fuel supply under full load operation.
2. Fuel level sight gauge.
3. Flexible fuel inlet/outlet lines for feed and return. Fuel is to return from engine by gravity. Provide check valves in return and intake lines if recommended by the engine supplier.
4. Fill line extended through the enclosure and provided with a lockable cap.

5. Leak detection system to monitor any leakage in the annular space of the tank. Refer to Paragraph 2.01.I.
6. 2-inch normal vent riser for primary tank and 4-inch emergency vent for both the primary and containment tanks. Normal vent riser shall terminate not less than 12 feet above surrounding grade.
7. Drain petcock valve.
8. Fuel strainer.
9. Fuel tank overfill protection alarm: Provide a sensor with an audible alarm that indicates when fuel level is at approximately 85% capacity.
10. Electronic Fuel Level Transmitter – 4-20 mA Output

G. Vibration Isolation System for Engine-Generator Unit:
1. Isolation system shall consist of the sub-base fuel tank being anchored to a reinforced concrete inertia pad, and the engine-generator set mounted atop the fuel tank supported by earthquake-restrained spring vibration isolators.
2. Vibration isolation shall be greater than 95%.
3. Vibration isolation system Korfund Dynamics Corporation Series L Isolators supporting a Type RCPF base frame, Mason Industries Type KSL Base supported on SSLFH Mounts with adjustable vertical limit stops, or equal.
4. Vibration isolators shall be configured to limit horizontal movement to a maximum of 0.25 inches in each horizontal direction.

H. Engine-Generator and Accessories Manufacturers, Model Numbers and Sizing Data:
1. Engine manufacturer shall be Kohler, Cummins or approved equal
2. Minimum standby rating: 40 KW (at 0.8 power factor). If engine manufacturer's 40 KW does not meet requirements, uprate engine to meet Engine-Generator requirement of 2.01.C.1.a.
3. Voltage dip characteristics: The maximum voltage dip shall not exceed 20% during starting of any of the two steps listed on the following table. Steps include miscellaneous load and motors. Typical motor will be Code G.
4. Generator output:
   a. Voltage: 480Y/277
   b. Phase: 3
   c. Wires: 4
5. Maximum engine speed: 1,800 rpm
6. Starting Steps:
   a. Step 1: 5 kVA miscellaneous loads and one 10 hp waste water pump
   b. Step 2: One 10 hp waste water pump

I. Fuel Leak Detection System: Provide a fuel leak detection system to monitor any fuel leaks from the fuel tank or piping system. The system shall be fully automatic and shall include, but not be limited to, sensor, cable, visual alarms, remote test and self-diagnostic trouble alarm, intrinsic safety barrier, auxiliary relay output for input to the PLC remote alarm and false alarm suppression. Unit shall be FM approved. Electrical service shall be 120 volt, 60 Hz.

PART 3 – EXECUTION

3.01 BAAQMD APPLICATION

A. The contractor is responsible for preparing the application forms for the application to the BAAQMD (Bay Area Air Quality Management District) for the permit to operate the

generator in the name of the Town of Woodside and deliver approved permit to the Town within 45 days from notice to proceed. This includes preparing the application forms, paying the application fees and submitting to the BAAQMD for the permit to operate the generator within 15 days of receiving notice to proceed. The forms required to be submitted by the contractor include the following:

1. ICE Form (Internal Combustion Engine)
2. HRSA Form (Health Risk Screen Analysis) with site plans
3. P101b Form (Application)

3.02 ENGINE-GENERATOR INSTALLATION

A. General: Mount and anchor the engine-generator set and the fuel tank assemblies to a concrete base pad. Provide isolator pads as specified in paragraph 2.01.G. Design the engine-generator set anchorage and support systems to resist seismic earthquake force. In the shop drawing submittals, include calculations to demonstrate the adequacy of the anchorage and support systems.

B. Foundations, Installation and Grouting: Furnish the necessary materials and construct suitable concrete foundations.

C. Skilled mechanics shall install all such equipment in accordance with the instructions of the manufacturer.

D. In setting equipment, make an allowance of at least 1 inch for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and as inconspicuously as possible in the completed work. Unless otherwise approved, all grout shall be an approved non-shrink, non-metallic grout.

E. Non-shrink, non-metallic grout shall be a dimensionally stable, inorganic, premixed grout resistant to acids, alkalies, salt water, and shall be unaffected by water and oil. It shall have high strength even when used as a pourable mixture, and shall bond well with steel and cured concrete or be compatible with a suitable bonding agent that shall then be used to effect the bond. It shall be used in strict accordance with the manufacturer's recommendations. It shall be similar, equivalent, and equal to "Five Star Grout" as manufactured by U.S. Grout Corporation; Bonsal Construction Grout, as manufactured by Bonsal Company; or equal.

F. Fuel and Lubricants: During testing and prior to acceptance, furnish all fuel and lubricants necessary for the proper operation of this equipment.

G. Tools: For each type of equipment to be furnished by the Contractor, provide a complete set of all special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation and maintenance of such equipment.

3.03 WIRING

A. Wiring, including ground, control circuits, and accessories, between generator and generator control panel, starter, and automatic transfer switch shall be in accordance with manufacturer’s recommendations and NEC, unless shown otherwise. Battery

cables shall be adequate to supply full voltage to the starter. Battery charger and radiator heater shall be wired on separate circuit breakers and circuits.

B. Route conduits to reach their destination in a neat and orderly manner.

C. All engine-generator set wiring embedded in concrete, below grade, or floor level, shall be in rigid conduits.

D. Conduits terminating on the engine-generator assembly shall be protected from vibration by a section of flexible conduit.

E. Grounding: Generator shall be grounded directly to the service entrance ground, in accordance with NEC.

F. In the vicinity of terminations, lace all power conductors to resist short circuit forces.

3.04 TESTING AND RUN-IN

A. General: Tests are to determine proper operation and capacity of the equipment and to demonstrate compliance with the Drawings and Specifications. All equipment that fails any test will be rejected, and complete re-testing will be required after the Contractor makes corrections or modifications to equipment, which has previously failed any test. All field tests shall be witnessed by the Engineer.

B. Factory Tests: Factory test the engine-generator to assure compliance with the Drawings, Specifications, NEMA MG-1, and the manufacturer's quality control provisions. Provide three copies of all factory test reports.

C. Field Tests:
   1. General: Fully field test the engine-generator to demonstrate the units are in compliance with the Specifications and are ready for service.
   2. Installation of the engine-generator shall be complete and the unit shall be serviced, tested, adjusted, and ready for use before the field tests are scheduled.
   3. Provide written notice of the scheduled dates for the field test and give to the Engineer at least ten (10) working days prior to the field test date. The notice shall include a written test schedule listing the tests, the test procedure, the criteria for a satisfactory test, and description of special measurement equipment to be employed.
   4. Make repairs and adjustments as required to achieve satisfactory performance of the engine-generator unit. If repairs or adjustments are made during the tests, additional testing shall be performed as required by the Engineer, at no additional cost.
   5. Make written records of the tests, and within ten (10) days submit three (3) copies of the test records to the Engineer. The test record shall indicate the test criteria and arrangement, the time of the test, the results, and pertinent data such as voltage, frequency, kilowatts, power factor, load current, oil pressure, water temperature, and ambient temperature. Pertinent data shall be recorded for each test, and at least every thirty (30) minutes when the test requires more than thirty (30) minutes.

D. Alarm, Control, and Equipment Tests:
   1. Demonstrate each alarm and safety shutdown provision as being caused by the abnormal condition unless an alternative test condition has been favorably reviewed by the Engineer prior to the scheduling of the tests.
   2. Operate each control circuit and device to demonstrate its proper operation.
   3. Demonstrate the battery charger and jacket water heater operation successfully.

E. Operational Tests:
   1. Simulate a power failure in order to demonstrate the proper operation of the transfer switch and engine-generator.
   2. Demonstrate motor starting capability by applying the specified initial load and then the equivalent of starting and running the specified motor loads. Voltage dip shall be measured and recorded to demonstrate conformity to the Specifications.
   3. Show that phase rotation of the engine-generator and the utility power are compatible at the site.

F. Endurance Tests:
   1. Operate the engine-generator for 1/2 hour at one-half its kW rating.
   2. Operate the engine-generator for six (6) hours continuously at 100% of its kW and kVA ratings.
   3. Measure the temperature rise of the windings of the generator using the resistance method.

G. Provide fuel, test equipment, labor, materials, and all other equipment and services required for all tests.

3.05 TRAINING

A. Provide instruction to Owner's personnel.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Diesel Generator with sound enclosure and subbase fuel tank will be measured for payment as lump sum.

4.2 PAYMENT

A. The contract lump price paid for diesel generator with sound enclosure and subbase fuel shall include all materials, labor, equipment and related work items to install generator onto existing concrete pad including but not limited to BAAQMD application, pad preparation and plug, conduit and wiring to the switch, and mounting onto existing pad and removal and disposal of existing generator, complete in place, as shown on the plans and as directed by the Engineer.

END OF SECTION 00 3800

SECTION 00 3900 – GROUNDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provisions: Applicable provisions of Section 00 3200 become a part of this Section as if repeated herein.

B. Work Included: Furnish all labor, material, equipment, tools and services necessary for the installation, connection and testing of all grounding as specified herein and as shown on the Drawings.

1.02 REFERENCE STANDARD

A. American Society for Testing and Materials (ASTM) Publication:
1. B228-02 Standard Specification for Concentric-Lay-Stranded Copper Clad Steel Conductors

B. National Fire Protection Association (NFPA):
1. 70 National Electric Code (NEC)

C. International Electrical Testing Association (NETA) Publication:
1. ATS Acceptance Testing Specifications for Electrical Equipment for Power Systems

1.03 SUBMITTALS

A. Submit material or equipment data in accordance with the the submittal requirements of Section 00 3200.

PART 2 - PRODUCTS

2.01 GENERAL

A. The grounding systems shall consist of the ground rods, grounding conductors, ground bus, ground fittings and clamps, and bonding conductors to water piping and structural steel as shown on the Drawings. One system shown provides service and separately derived system grounds. A second system is an electronic ground system to provide for the discharge of static electricity.

2.02 SYSTEM COMPONENTS

A. Ground Rods: Ground rods shall be cone pointed copper clad Grade 40 HS steel rods conforming to ASTM B228-02. 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 10 feet long, unless otherwise indicated. Rods longer than 10 feet shall be made up of 10-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.

Coat all ground connections except the exothermic welds with electrical joint compound, non-petroleum type, UL listed for copper and aluminum applications.

C. Ground Connections: Connection to ground rods and buried connections shall be by exothermic weld. Lugs 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 a 9-inch-diameter precast concrete unit with hot-dip galvanized traffic covers. Units shall be 12-inches deep. Covers shall be embossed with the wording "Ground Rod."

E. Ground Bus: Ground bus shall be a high conductivity copper alloy strap measuring 3/16-inch by 3/4-inch and of lengths as shown on the Drawings. Bus shall be predrilled and tapped to accept 8-32 brass machine screws on 12-inch centers.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Ground all equipment for which a ground connection is required per NEC whether or not the ground connection is specifically shown on the Drawings.

B. 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.

C. Where ground rods must be driven to depths over 8 feet, increase rod diameter used, sufficiently to prevent the rod from bending or being damaged.

D. Bond metallic water piping at its entrance into each building. Ground separately derived electrical system neutrals to the metallic water piping in addition to the system driven ground, per NEC requirements.

E. Provide a ground wire in every conduit carrying a circuit of over 150 volts to ground.

F. Provide UFER grounding electrode as shown on Drawings.

G. Effectively bond structural steel for buildings to the grounding system using exothermic welds.

3.02 TESTING

A. Conduct ground resistance tests using a ground megohmmeter with a scale reading of 25 ohms. Maximum resistance shall not exceed 10 ohms.

B. Test methods shall conform to NETA Standard using the three electrode method. Conduct tests only after a period of not less than 48 hours of dry weather.

C. Furnish to the Engineer a test report with recorded data of each ground rod location.

PART 4 MEASUREMENT AND PAYMENT

Measurement and payment for grounding will not be made separately and shall be considered to be included in the various contract item of works required for electrical grounding.

END OF SECTION 00 3900

SECTION 00 4000 – AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Section includes but is not limited to:

1. Furnishing and installing an automatic transfer switch.

1.2 SUBMITTALS

A. Submit in conformance with the requirements of Section 00 3200 the following items:

1. Automatic transfer switch.
2. Wiring diagrams.

1.3 REFERENCES

A. UL 1008 Standard for Automatic Transfer Switches

B. NFPA 70 – National Electrical Code, Articles 517, 700, 701 and 702

C. NFPA 110 – Standard for Emergency and Standby Power Systems

D. NEMA Standard ICS10-2005 – AC Automatic Transfer Switches

E. NEMA Standard ICS1-109.21 – Testing of Electrical Equipment

F. NEC Articles 700, 701, 702

G. International Standards Organization ISO 9001:2008

PART 2 - PRODUCTS

2.1 AUTOMATIC TRANSFER SWITCH WITH TIME DELAY

A. Automatic Transfer Switch: An open transition type automatic transfer switch of the ampere rating and number of poles shown on the plans shall be furnished and installed. It shall be mechanically and electrically interlocked, electrically operated by power from the source to which it is transferring, and mechanically held in both normal and emergency positions. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which transfer or retransfer is being made. The overlapping neutral transfer contacts shall not overlap for a time duration greater than 100 milliseconds. It shall be listed by Underwriters Laboratories under UL Std. 1008 for emergency systems and shall be rated for continuous duty and all classes of load.

B. When the voltage of any phase of the normal source drops below 70% of nominal voltage for more than three seconds, contacts shall close to initiate engine starting. When the generator set reaches at least 90% of rated voltage and frequency, the

switch shall transfer to the emergency source after a 0-10 second adjustable time delay.

C. When all phases of the normal source have been restored to 90% or more of rated voltage for an adjustable time of 0-30 minutes, the switch shall retransfer the load to the normal source and signal the engine to shut down. A five-minute unloaded running time delay shall be provided in the transfer switch or the engine starting controls.

D. In the event of failure of the automatic transfer mechanism, or for testing purposes, means for manual operation/bypass operation shall be provided. The transfer switch shall include a test switch to simulate normal source power failure and an automatic battery charger with an output voltage matching the engine starting system.

C. An adjustable electronic plant exerciser time switch controller shall be provided in transfer. Time switch shall allow for a weekly genset testing schedule, with run time adjustable from 15 to 90 minutes minimum. In addition, the controller shall also be able to accept remote signal (via telephone line, contact closure, etc.) for transfer.

D. Provide the following discreet dry contacts, each rated 1 amp, 30 volts DC
1. ATS in “Normal” Position
2. ATS in “Emergency” Position
3. Normal Power Available
4. Emergency Power Available.

E. The following accessories shall be provided:
1. Relay Expansion Module – For open transition transfer that includes one form C contact for source availability of the normal and emergency sources.
2. Enclosure Heater – A 125 Watt enclosure heater with transformer and thermostat (adjustable from 30°F to 140°F) for outdoor installations.
3. Connectivity Module – To enable remote monitoring and control capabilities.
4. Surge Suppression – A TVSS with a surge current rating of 65kA shall be provided with individually matched fused metal oxide varistors.
5. Current Sensing Card – To measure either single or three phase load current.
6. Extension harness – For units to accommodate customer mounting of controls and switch.

F. As manufactured by ASCO or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit in accordance with manufacturer’s drawings and instruction manuals.

B. Provide all control wiring connections to genset for testing, manual and automatic operation. Label and tape all control wires at ATS and genset and all junction and pull boxes.

C. Set and adjust plant exerciser time switch control for weekly operation, with time of day and duration of test as directed by Town's representative.

PART 4 MEASUREMENT AND PAYMENT

Measurement and Payment for automatic transfer switch is considered to be included in the bid item for electrical service/control cabinet and no separate payment will be made therefore.

END OF SECTION 00 4000

SECTION 00 4100 – INSTRUMENTATION AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
1. Provide all tools, equipment, materials, and supplies and be responsible for all labor required to complete the installation, startup and operational testing of a complete and operable Instrumentation and Control (I&C) System as indicated on the Drawings and as specified herein.
2. Provide all the necessary equipment components and interconnections along with the services of manufacturers' engineering representatives necessary to ensure that the Owner receives a completely integrated and operational I&C system as herein specified.
3. Provide all terminations for wiring at field-mounted instruments, equipment enclosures, alarm and status contacts.
4. Provide all Instrumentation and Control wire required for a fully functioning Instrumentation and Controls System as shown on the Drawings except for wire specifically specified in Section 00 3500.
5. The work in this section shall be performed by an I & C subcontractor as described in paragraph 1.03 below.

B. Work Specified in Other Sections:
1. Process piping, installation of inline instrumentation, and other mechanical work and equipment as specified herein.
2. Instruments and controls that are not directly used for process control, i.e., those provided as part of a package system.
3. Applicable provisions of Sections 00 3200 through Section 00 4000, which includes all instrumentation and controls conduit and wire for specific requirements for wire, conduit, grounding, and other electrical equipment.

1.02 REFERENCE STANDARDS

A. American National Standard Institute (ANSI) Publications:
1. Y14.15a Drafting Practice
2. C62.1 Surge Arresters.

B. Instrumentation Society of America (ISA) Publications:
1. S5.4 Instrument Loop Diagrams.
2. S20 Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.

C. American Society for Testing and Materials (ASTM) Publication:
1. A276-03 Standard Specification for Stainless Steel Bars and Shapes.

1.03 I&C SUBCONTRACTOR QUALIFICATIONS

A. An I&C Subcontractor shall be an electrical contractor who has demonstrated experience in purchasing, calibrating, fabricating, installing and testing the Instrumentation and Control (I&C) products listed in this Specification Section. Normally, the I&C Subcontractor is a systems house regularly engaged in the business

of panel fabrication, control component procurement, programmable logic controller and personal computer (PC) application in the process control industry.

B. The I&C Subcontractor has been regularly engaged for a period greater than five years in performing all aspects of the type of work specified in this Section and shown on the Drawings and must be qualified as specified below.

C. The I&C Subcontractor shall submit 1) proof in the form of names and references of jobs over the past five years where this work was accomplished, 2) present samples and an explanation of representative work performed, 3) submit the name and qualifications (resumes) of the proposed employees of the firm who would be responsible for the day-to-day work, and 4) an explanation of how the I&C Subcontractor will carry out and implement the responsibilities described in the following section.

D. I & C work shall be performed by EDCCO Group or approved equal.

1.04 I&C SUBCONTRACTOR SYSTEM RESPONSIBILITIES

A. General: The I&C equipment as specified in this Section shall be considered an integrated system. Entire system installation including calibration, verification, startup, operation testing, and training shall be performed by qualified personnel, possessing all the necessary skills and equipment, and who have had experience performing similar installations. Instrumentation and control systems drawings are diagrammatic only; it is the responsibility of the Contractor to obtain technical data, determine performance requirements, develop instrumentation detail installation designs, and coordinate the selection of specified equipment with Contractor supplied equipment to meet the design conditions stated.

B. Certain primary elements, final control elements, etc., which are installed in the process lines are specified under other sections of these Specifications; however, the installation of these elements shall be under the supervision of the I&C subcontractor to the extent recognized by previous labor agreements.

C. System Responsibilities:
   1. Instrumentation and control system drawings are diagrammatic only. Ensure that all components of the instrumentation system, including primary measuring, indicating, transmitting, receiving, recording, totalizing, controlling, and alarming devices and all appurtenances are completely compatible and shall function as outlined and shall furnish and install such additional equipment, accessories, etc., as are necessary to meet these objectives at no additional cost to the Owner.
   2. Compatibility: See that all components of the instrumentation system, including equipment specified under other Sections, are completely compatible and function properly as a system. Provide such additional equipment, accessories, etc., as are necessary to meet these objectives at no additional cost to the Owner.
   3. Coordination: For control components, devices, and systems as specified herein, as shown on plans and as directed by the Engineer.
      a. Provide technical advice to mechanical and electrical subcontractors as necessary regarding their installation of instruments.
      b. Verify the correctness of installation of all instruments.
      c. Verify that the proper type, size, and number of control wires with their conduits are provided.

d. Verify that proper electric power circuits provided for all components and systems.
e. Resolve all manufacturers' installation discrepancies between requirements and the detail requirements of the Drawings and Specifications.
f. Supervise final signal connections, both electric and pneumatic, to all process instrumentation and control equipment.
g. Adjust, startup, and test all process instrumentation and control equipment.
h. Provide specified documentation and training.

4. Performance: While the Drawings provide sufficient information to establish the form and function of the systems and their relationships, the responsibility for system integration and performance rests solely with the Contractor. The Engineer provides technical instruction and guidance where needed.
5. Site and Instrument Inspection: Inspect site for conformance to Drawings, paying special attention to space allocation and dimensions shown or required on Drawings. Inspect each instrument and piece of equipment for damage, defects, completeness, and correct operation before installing.

1.05 SUBMITTALS

A. Shop Drawings: Submit shop drawings (diagrams) for review in complete bound sets indexed by Specification number, with exterior tabs marked by subject. Submit manufacturer's catalog cuts for each item for which shop drawings are not required. Manufacturer's catalog cuts, specifications or data sheets shall be clearly marked to delineate the options or styles to be furnished. Show dimensions, physical configurations, methods of connecting instruments together, mounting details, and wiring schematics. Drawings shall be complete with device tag numbers, wire numbers and terminal board numbers. Submit fabrication details, nameplate legends, and control panel internal wiring and piping schematic drawings. Submit panel graphic drawings where applicable. Include material lists and/or bills of material.

1. Loop Diagrams:
   a. Submit Instrument Loop Diagrams per ISA S5.4 to provide necessary detail for connection of analog instrument and control system components including those components specified in other sections of these Specifications.
   b. Provide with the Instrument Loop Diagrams all instrument model numbers, ranges, set points, sizes, process fluids, specification reference numbers, and all other information listed as "desirable and optional items of information" per ISA S5.4.
2. Interconnection Diagrams:
   a. Submit point-to-point type interconnection diagrams conforming to ANSI Y14.15a. Include each conduit run, with wire fill noted for each run. Include electric panel and circuit numbers for all sources of 120 Vac power. Show conduit and wiring interconnections between each control panel, instrument, multiplexer or telemetry unit, motor control center, motor combination starter, valve actuator, and other field-mounted device. Include all equipment and appurtenances provided in this contract regardless of the Division in which it is specified.
   b. Add to all diagrams the instrument model numbers, instrument ranges, set points, sizes, process fluids, specification reference numbers and other information listed as "desirable and optional items of information per ISA S5.4."
3. Elementary Diagrams: Submit an elementary diagram (also known as a schematic diagram) for control, protection, and monitoring circuits. Elementary diagrams are not required for lighting, communications and those systems clearly defined on the

single line diagram. Show all interconnections between power sources, apparatus, and device elements of a particular system or equipment, and all interlocks with other systems in a manner, which fully indicates circuit function and operation. Refer to the Drawings for functional and operational requirements.

B. Specification Forms:
   1. Submit completed Specification Forms per ISA S20, including those instrumentation and control components directly related to process control, but specified in other divisions of these Specifications.
   2. Include on each form the assigned tag numbers, manufacturer's part numbers, and device data. More than one tag numbered item may be included on a sheet.

C. As-Built Drawings: Submit a revised set of shop drawings that incorporates all change orders and modifications made during performance of the work. In addition to updated loop diagrams, interconnect diagrams, and elementary diagrams, submit equipment and device wiring diagrams and other drawings as necessary to depict the "as-built" condition of equipment. Include all installed field and panel conduit and piping/tubing runs and routing, tray systems, supports, mounting details, interconnection diagrams with cable, wire, tube, and termination numbers. Coordinate all drawings with the conductor identification requirements in Sections 00 3500. Submit a copy of CAD produced drawings on magnetic media in AutoCAD DWG format.

D. Operation and Maintenance Manuals: Furnish Operation and Maintenance Manuals, including Instruction Manuals and Part Lists, for all electrical, instrumentation and control equipment as required by Section 00 3200. Obtain data from manufacturers, and format and bind as specified. Obtain distribution method instructions from the Owner or his representative.
   1. Schedule: Deliver at least two (2) copies of manuals in 3-ring binders (8-1/2 by 11 inch format) not later than the equipment shipment date.
   2. Contents: Include in manuals not less than the following information, as applicable, for each instrument, equipment, subsystem and/or control loop:
      a. General, introduction and overall description, purpose, functions, simplified theory of operations, etc.
      b. Specifications (including equipment specification data sheet as described above under Shop Drawings), sufficiently detailed for reordering exact duplicates of the original items.
      c. Installation instructions, procedures, sequences, tolerances, and precautions.
      d. Operational procedures.
      e. Shutdown procedures.
      f. Maintenance, calibration, and repair instructions.
      g. Parts list and spare parts recommendations.
      h. Calibration curves, rating tables and any other data showing the relationship of the variable inputs and the calibrated output of all measuring devices and controlled equipment.
   3. Format:
      a. Use drawings and pictorials to illustrate the text to the extent necessary to insure a clear, concise presentation. If manuals have been written to cover a family of similar instruments or equipment, strike out inapplicable information in a neat fashion or emphasize applicable portion by heavily weighted arrows, circles or boxes; whichever provides the clearest and neatest presentation.
      b. Group manuals by system control panels, including field instrumentation connected or associated with the panel. Where identical instruments are used in more than one control loop or subsystem, include only one instruction

manual, per panel grouping; however, an index by tag number for all instruments shall identify its location in that manual.

c. Provide control loop and/or subsystem operational descriptions to identify the function of each instrument and its relation to the other instruments in the loop.

4. Binding: Bind each manual in a cover which indicates the panel or process area to which it applies manufacturer's name, local address and telephone number, and year of purchase. Punch and bind manuals in standard three ring binders and include system name and subcontractor's name on binding.

E. Accessory and Maintenance Materials: Submit data for the following items:

1. Special Tools and Accessories: Special tools, instruments, and accessories for maintaining instruments and equipment requiring periodic repair and adjustment as specified elsewhere herein. Also, furnish special lifting and handling devices for equipment requiring such devices.
2. Maintenance Materials and Spare Parts: Submit a list of manufacturer recommended spare parts for each item specified. Refer to other sections of these Specifications.

F. Test Reports: Submit the following test reports as described herein:

1. Factory Testing of Control Panels.
2. Instrument Verification Report.
3. Final Operational Testing.

G. Demonstration and Final Operation Test Plan and Results: Submit a document that outlines all procedures to be used in final operational testing of instrument and control systems. Include a description of each system, the scope of testing, test methods and materials, testing instruments and recorders, a list of functional parameters to be recorded on each item, and Shop Drawings showing temporary bypasses, jumpers, and devices.

1.06 QUALITY ASSURANCE

A. Standard of Quality: The Contractor shall provide equipment of the types and sizes specified which has been demonstrated to operate successfully. Provide equipment which is new and of recent proven design.

1.07 INSPECTIONS

A. The Engineer may inspect the fabricated equipment at the factory before shipment to job site. Provide the Engineer with sufficient prior notice so that an inspection can be arranged at the factory.

B. Inspection of the equipment at the factory by the Engineer will be made after the manufacturer has performed satisfactory checks, adjustments, tests and operations.

C. Favorable review of the equipment at the factory only allows the manufacturer to ship the equipment to the project site. The Contractor shall be responsible for the proper installation and satisfactory startup operation of the equipment to the satisfaction of the manufacturer and the Engineer.

1.08 DRAWINGS

A. Drawings: The Drawings are diagrammatic; exact locations of equipment shall be determined in the field by the Engineer. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or material, the requirements or descriptions in this Specification shall take precedence in the event of conflict.
   1. Locations of equipment, inserts, anchors, motors, panels, pull boxes, manholes, conduits, stub-ups, fittings, power and convenience outlets, and ground wells are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verifies scaled dimensions on Drawings.
   2. Review the Drawings and Specification Divisions of other trades and perform the instrumentation work that will be required for the installations.
   3. Should there be a need to deviate from the Instrumentation Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.
   4. Resolution of varying interpretations of the Contract Documents shall conform to the requirements of the General Conditions.
   5. The Drawings provide details of installation and supersede the manufacturer's recommendation where a conflict exists.

1.09 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Box, crate, or otherwise enclose and protect instruments and equipment during shipment, handling, and storage. Keep all equipment dry and covered from exposure to weather, moisture, corrosive liquids and gases or any element, which could degrade the equipment. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Notify the Engineer in writing in the event that any equipment or material is damaged. Obtain prior favorable review by the Engineer before making repairs to damaged products.

PART 2 PRODUCTS

2.01 MATERIALS AND STANDARD SPECIFICATIONS

A. Provide instruments, equipment and materials suitable for service conditions and meeting standard specifications such as ANSI, ASTM, ISA, and SAMA. The intent of this Specification is to secure instruments and equipment of a uniform quality and manufacture throughout the plant. All instruments in the plant of the same type shall be made by the same manufacturer.

2.02 TELEMETRY EQUIPMENT

A. The telemetry panel shall be the PCMNET telemetry panel as provided by ISAC (Integrated Systems and Control Inc.).

B. The ISAC supplied components include the back plate assembly (26”W X 18”H X 6”D), controller, modem, 3 current sensors, temperature sensor, battery and charger.

C. Monitoring and Control functions include pump operation and status, 4-20mA inputs, cycle and runtime logs, remote pump override and alarms.

D. The ISAC supplied services include system startup onsite, programming, configuring the Monitoring Center to recognize alarms from the pump station, poling the pump station for integrity and for remote operation from the Monitoring Center.

2.03 WET WELL LEVEL CONTROLLER

A. The wet well level controller shall be the Hydroranger 200 (6 relay) model as shown on the plans and as manufactured by Siemens.

B. The level controller shall be complete with the appropriate ultrasonic level sensor and lead-in cable.

2.04 NAMEPLATES

A. For each piece of equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings and the model designation.

B. Identify each piece of equipment and related controls with a rigid laminated engraved phenolic nameplate. 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 screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscription is indicated on the Drawings, furnish nameplates with an appropriate inscription furnished by the Engineer upon prior request by the Contractor.

C. Each control device, including pushbuttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.

D. Provide CAUTION or SAFETY nameplates to alert operators of special conditions that may result in faulty equipment operations. Devices containing batteries that must be replaced periodically must be clearly identified. Nameplates are not required if the device senses and displays a low battery warning.

2.05 NAME TAGS

A. All instrumentation and equipment items or systems shall be identified by name tags. Field equipment shall be tagged with the assigned instrumentation tag number listed in the Specifications.

B. Name tags shall be stainless steel with engraved or stamped black characters of 3/16 inch minimum height. Tags shall be attached to equipment with a tag holder and stainless steel band with a worm screw clamping device. Use 20-gauge stainless steel wire where banding is impractical. For field panels or large equipment cases use stainless steel screws; however, such permanent attachment shall not be on an ordinarily replaceable part.

2.06 FIELD-MOUNTED EQUIPMENT

A. All instrument and control equipment mounted outside of protective structures shall be equipped with suitable surge arresting devices to protect the equipment from damage due to electrical transients induced in the interconnecting lines from lightning discharges or nearby electrical devices. Protective devices used on 120 Vac inputs to

field mounted equipment shall be secondary valve surge protectors conforming to the requirements of ANSI C62.1.

2.07 EQUIPMENT OPERATING CONDITIONS

A. All equipment shall be rated for normal operating performance with varying operating conditions over the following minimum ranges:
   1. Electrical Power: 120 Vac ±10%, 60 Hz, unregulated, except where specifically stated otherwise on the Drawings or in the Specifications, or when two-wire, loop-powered devices are specified.
   2. Air: 85 +5 psig.
   3. Field Instruments:
      a. Outdoor Areas:
         1) Ambient Temperature: +20°F to +120°F.
         2) Ambient Relative Humidity: 5% to 100%.
         3) Weather: Rain and sleet.
      b. Indoor Unheated Areas:
         1) Ambient Temperature: +40°F to +120°F.
         2) Ambient Relative Humidity: 5% to 95%, non-condensing.
      c. Indoor Environmentally Controlled Areas:
         1) Ambient Temperature: +60°F to +104°F.
         2) Ambient Relative Humidity: 10% to 90%, non-condensing.

2.08 EQUIPMENT LOCATIONS

A. Provide equipment and materials suitable for the types of locations in which they are located as defined under Division 16. All equipment specified for field mounting shall be weatherproof and splash proof as a minimum. If electrical or electronic components are contained within the equipment, they shall be housed in NEMA 3R gasketed cases, and NEMA 4X in corrosive locations unless noted otherwise on the Drawings.

2.09 ANALOG SIGNAL INDICATED UNITS

A. For all instruments with local or remote indicators, provide indicators scaled in actual engineering units, i.e., gallons per minute, feet, psi, etc., rather than 0 to 100%, unless noted otherwise on the Drawings.

2.10 SIGNAL TRANSMISSION

A. Analog: Signal transmission between electrical or electronic instruments shall be 4 20 mA and shall operate at 24 Vdc. Signal output from all transmitters and controllers shall be current regulated and shall not be affected by changes in load resistance within the unit's rating. Where practical, milliampere signals from the field shall be converted to a voltage signal at the external terminals of each panel, and all instruments within a panel shall be parallel wired.

B. Nonstandard transmission systems such as impulse duration, pulse rate, and voltage regulated will not be permitted except where shown on the Drawings. When transmitters with nonstandard outputs do occur, their output shall be converted to 4-20 mA prior to transmission.

C. Discrete: All alarm and status signals shall be 120 Vac unless specified otherwise. Proprietary data highway or serial bit transmissions such as RS232C shall be allowed to the extent shown on the Drawings.

2.11 FASTENERS

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel. Provide stainless steel fasteners in corrosive locations. When fastening to existing walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is 3/8 inch.

PART 3 EXECUTION

3.01 MOUNTING

A. The ISAC telemetry equipment and the Hydroranger 200 equipment shall be delivered to the service and control panel manufacturer for installation.

B. Mount and install equipment as indicated. Mount field instruments on pipe mounts or other similar means in accordance with suppliers' recommendation. Where mounted in control panels, mount according to requirements of that section.

C. Equipment specified for field mounting shall be suitable for direct pipe mounting or surface mounting, surface-mounted indicators and equipment with calibration adjustments or requiring periodic inspection shall be mounted not lower than 3 feet 6 inches nor higher than 6 feet above walkways, platforms, catwalks, and the like.

D. Note that applicable specifications require detail drawings showing seismic sway bracing design and anchorage requirements for their equipment.

E. All devices shall be accessible to operators for servicing, operating, reading, etc. Provide permanent platforms to assure devices are continuously accessible.

3.02 SYSTEM STARTUP

A. ISAC shall perform programming, setup and testing of the telemetry system including configuring the Monitoring Center for remote operation of the pump station, recognizing alarms and poling the system for integrity.

B. The system Integrator shall be responsible for setup and testing all other equipment including the Hydroranger 200, level sensors and coordinating with ISAC, the telemetry provider.

3.03 FIELD WIRING

A. Ring out signal wiring prior to termination and perform surge withstand tests where required (see Section 16010, Part 3 for methods). Verify wire number and terminations are satisfactory as designated on the Loop and Interconnect Diagrams. Verify all terminations are tight and shields are uniformly grounded at one location.

3.04 ELECTROMAGNETIC INTERFERENCE (EMI)

A. Construction shall proceed in a manner which minimizes the introduction of noise (RFI/EMI) into the I&C System.

B. Cross signal wires and wires carrying ac power or control signals at right angles.

C. Separate signal wires from wires carrying ac power or switched ac/dc control signals within control panels, terminal cabinets, telemetry equipment, multiplexer cabinets, and data loggers as much as possible. Provide the following minimum separations within such equipment unless indicated otherwise on the Drawings.

Power Wiring Capacity	Separation (Inches)
120 volts ac or 10 amps	12
240 volts ac or 50 amps	18
480 volts ac or 200 amps	24
4,160 volts ac or 800 amps	48

3.05 SIGNAL GROUNDING

A. Proper grounding of equipment and systems in this Division is critical if computer and associated networks and peripherals are involved. The Drawings and Section 16450, specify safety grounding for all equipment in this Division.

B. A single-point grounding system for instrument signals is required for all instrument panels. This instrument single point grounding system does not use building steel or conduit systems for its ground path.
   1. Ground all signal shields, signal grounds, and power supplies at an isolated signal bus within each instrument panel, rack, or enclosure. The shields at the far ends of these signal cables must be disconnected (floated) from any ground to prevent ground loops.
   2. Do not connect the rack or enclosure frames to the signal grounding buses.
   3. Connect each isolated signal ground bus within each panel using a stranded, insulated copper wire of size 6 AWG or larger directly to a grounding ground rod installed per the Drawings.

3.06 PREPARATION

A. Ensure that installation areas are clean and that concrete or masonry operations are completed prior to installing instruments and equipment. Maintain the areas in a broom-clean condition during installation operations.

B. Panels shall be protected during construction to prevent damage to front panel devices and prevent dust accumulation in the intervals. Other protective measures (lamp, strip heaters, etc.) shall be included as weather conditions dictate.

3.07 FIELD TESTING

A. General: The purpose of the field testing is to verify instruments are calibrated and operationally performing their intended function. Provide the services of factory trained and experienced engineers to perform verification and operational testing as prescribed

below. Since the initial calibration of instruments may not satisfy the final operation of system, perform recalibration or adjust set points as required to satisfy the performance requirements of the system. Notify the Engineer and Owner in writing a minimum of 48 hours prior to the proposed date for commencing final operational testing and acceptance.

B. System Verification Testing: Verify that each instrument is operating and calibrated as specified in the by simulating inputs at the primary element in each system loop and verify performance at loop output devices (i.e. recorder, indicator, alarm, etc., except controllers). Simulate inputs at 0%, 25%, 50%, 75%, and 100% of span or with on-off inputs, as applicable. During system verification:
   1. Make initial or provisional settings on levels, alarms, etc.
   2. Verify controllers by observing that the final control element moves in the proper direction to correct the process variable as compared to the set point.
   3. Cause malfunctions to sound alarms or switch to standby to check system operation.
   4. Check all instruments thoroughly for correct operation.
   5. Test that the remote operating and monitoring of the Pump Station from the Monitoring Center is performing correctly.
   6. Immediately correct all defects and malfunctions disclosed by tests.
   7. Submit a report certifying completion of verification of each instrument system. This report shall include a data sheet on each instrument tested that indicates instrument tolerances, instrument calibration verification, data and initial settings made to devices.

C. Final Operational Testing: Upon completion of instrument verification, test all systems under process conditions in the presence of the Owner or designated representative. The test for each portion thereof shall be witnessed, documented and signed off upon completion by the Engineer. The intent of this test is to demonstrate and certify the operational interrelationship of plant instrumentation and control systems. This testing shall include, but not be limited to:
   1. Making final adjustments to levels, alarms, etc.
   2. Checking all alarms, failure interlocks, and operational interlocks.
   3. Verifying all inputs and outputs are fully functional.
   4. Immediately correcting all defects and malfunctions and retesting.

D. Submit the witnessed test results and a transmittal letter indicating that all required systems have been tested satisfactorily and the systems meet all the functional requirements of their applicable specifications.

3.08 INSTRUCTION OF OWNER'S PERSONNEL

A. Provide the services of a factory trained and field experienced instrumentation engineer to conduct group training of up to five of the Owner's designated personnel in the operation of each instrument system. This training shall be for the time period of four hours and shall be performed during the operational testing period. Include instruction covering operating principles and adjustments, routine maintenance and repair, and "hands on" operation. The text for this training shall be the Operation and Maintenance Manuals furnished under these Specifications.

PART 4 MEASUREMENT AND PAYMENT

Instrument and Control System will be measured for payment as lump sum as specified elsewhere in these specifications.

END OF SECTION 00 4100

SECTION 00 4200 – TIMBER LAGGING WALL

PART 1 GENERAL

A. DESCRIPTION

1. This work shall consist of furnishing and constructing pre-drilled 12” diameter hole fill in with PCC and timber lagging in accordance with this special provision and with the lines, grades and dimensions shown on the contract drawings and per the shop drawings prepared by the specialty wall contractor.

2. Pre-drilled holes and timber lagging wall is a wall system composed of redwood posts placed in a pre-bored hole, then encased in concrete. Portion of the posts will be embedded below the excavation are encased in structural concrete. After the posts are installed, timber lagging (redwood #1) is placed behind the posts to support the lateral soil loading behind. A Mirafi 140N filter fabric is also placed behind the timber lagging during excavation and placement of the lagging. Clean import gravel will be used to fill any voids between the timber lagging and retained soil.

PART 2 PRODUCTS

A. MATERIALS

1. Concrete Materials
   a. Cement: ASTM C150, Caltrans Standard Specification Section 90, Type II
   b. Water: Clean, potable and not detrimental to concrete.
   c. Mix and deliver concrete in accordance with ASTM C94
   d. Addition of water to the mix after leaving the plant is not permitted
   e. Air Entrainment: ASTM C260; “Daravair”, “”Micro-Air”, manufactured by W.R. Grace, Master Builders or equal.

2. Timber Posts and Lagging.
   a. Graded for extreme fiber stress of at least 1000 psi and with the full dimension thickness shown on the shop drawings. Posts and Lagging shall be treated timber meeting the requirements of Caltrans Standard Specifications. Redwood #1 lagging and rough sawn redwood posts treatment shall be used.

3. Filter Fabric.
   a. Fabric material shall be Mifari 140N or equivalent material approved by the Engineer.

PART 3 EXCUTION

A. Submittals

The Contractor shall submit their proposed drilled in post and lagging wall installation plans to the Engineer for review. The submission shall consist of details required to completely describe the retaining wall system and shall include the following:

1. Shop drawing for the location of posts and lagging wall shown on the contract drawings at least one (1) weeks before beginning the work, which indicate the following, at a minimum:
   a. Grade and strengths of all construction materials used.
   b. Details for the timber lagging.
   c. Method for installing the posts, including pre-drilling procedures.
   d. Mix designs for structural concrete and procedures for placing the structural concrete.
2. Review of the above submittals for the timber lagging wall by the Engineer will not relieve the Contractor from the responsibility for the adequacy of the construction of the wall to achieve the required results.

B. Drilled-in hole and Lagging Construction
1. Predrill holes for the posts installation. Diameter of the pre-drilled holes shall meet the dimensions shown on the plans. Prior to inserting the posts, make the necessary provision to allow the Engineer to sound each hole to assure that loose soil has been removed.
2. After installation of the posts, excavate along the proposed wall to the elevation shown on the plans. Install lagging and filter fabric as detailed in the plans,
3. Fill any gap between the posts and lagging wall and the retained fill with clean import gravel backfill shown in the plans..

C. Place 2” thick wood mulch in all disturbed soil area.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Measurement for Timber Lagging Wall and Drainage Swale will be lump sum.

B. Payment shall include full compensation for furnishing and placing all material, equipment, and labor necessary to satisfactorily for doing all the work to build lagging wall and drainage swale as shown in contract drawing, including but not limited to excavation and backfill, concrete encasement to the bottom of the hole, drain rock, gravel, filter fabric, timber lagging, nails, clips, pavement removal and restoration placing 2” thick wood mulch in all disturbed soil area as required and specified in these specifications, and as directed by the Engineer.

SECTION 00 4300 - INSULATED FIRE-RESISTANT METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. RELATED DOCUMENTS

1. Drawings, Divisions 0 & 1, including Doc. 007200 General Conditions, and the technical specifications apply to this Section.
2. Fire-resistant thermal insulation core metal wall panels, with related metal trim and accessories.
3. Foamed-insulation-core lap seam exposed fastener metal wall panels, with related metal trim and accessories.

B. RELATED REQUIREMENTS

1. Division 05 Section "Structural Steel Framing" for steel framing supporting metal panels.
2. Division 07 Section "Metal Wall Panels" for factory-formed metal wall panels.
3. Division 07 Section "Joint Sealants" for field-applied Joint Sealants.
4. Division 13 Section "Metal Building Systems" for steel framing supporting metal panels.

1.2 REFERENCES

A. ASTM International (ASTM):

1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process
2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
3. ASTM A 792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. ASTM C 518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
5. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
6. ASTM D 1621 – Compressive Properties of Rigid Cellular Plastics.
7. ASTM D 1622 – Apparent Density of Rigid Cellular Plastics.
8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
10. ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics
11. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
12. ASTM E 84 - Test Methods for Surface Burning Characteristics of Building Material.

B. National Fire Protection Association (NFPA) www.nfpa.org

1. NFPA 259 - Standard Test Method for Potential Heat of Building Materials
2. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load- Bearing Wall Assemblies Containing Combustible Components
3. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth

1.3 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer approved under an accredited third-party quality control program
B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years' experience in manufacture of similar products in successful use in similar applications.
C. Installer Qualifications: Experienced Installer with minimum of five years' experience with successfully completed projects of a similar nature and scope.
D. Installer's Field Supervisor: Experienced mechanic supervising work on site whenever work is underway.
E. Fire-Resistance Ratings: As indicated by UL Fire Resistance Directory designation.

1.4 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, metal panel installer, metal panel manufacturer's technical representative, inspection agency, and related trade contractors.
B. Coordinate building framing in relation to metal panel system.
C. Coordinate openings and penetrations of metal panel system.
D. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.5 SUBMITTALS
A. Product Data: Manufacturer's data sheets for specified products.
B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, curbs, vents, snow guards, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.Include data indicating compliance with performance requirements.Indicate points of supporting structure that must coordinate with metal panel system installation.Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors. Dark brown and/or black color to match generator or as approved by the Engineer.
D. Samples for Verification: Provide 12 inch- (305 mm-) long section of each metal panel profile.

1.6 INFORMATIONAL SUBMITTALS
A. Product Test Reports: Indicating compliance of products with requirements.
B. Qualification Information: For Installer firm and Installer's field supervisor.
C. Accreditation Certificate: Indicating that manufacturer is accredited under an accredited third-party Quality Control Program.
D. Warranty:
1. Submit manufacturer's written two (2) year limited warranty providing panels to be free from defects in materials and workmanship, beginning from the date of substantial completion excluding coil coatings (paint finishes) that are covered under a separate warranty.
2. The installation contractor shall issue a separate one (1) year warranty against defects in installed materials and workmanship, beginning from the date of substantial completion of the installation
3.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@ecoficientseries.com; Web: www.mbci.com.

2.2 PERFORMANCE REQUIREMENTS

A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.

B. Fire Performance Characteristics: Provide metal panel systems with the following fire-test characteristics determined by indicated test standard as applied by UL or other testing and inspection agency acceptable to authorities having jurisdiction.

C. Surface-Burning Characteristics: Provide metal panel systems with the following characteristics when tested per ASTM E 84. The core shall have:
1. Flame spread index: 25 or less.
2. Smoke developed index: 450 or less.

D. Fire Propagation: The fire assembly shall meet the requirements of the standard for:
1. NFPA 285
2. NFPA 286

E. IBC Chapter 26: Panel Performance under the above test methods, shall meet the requirements of IBC, Chapter on foam plastics.

F. Thermal Performance: When tested in accordance with ASTM C 518, Measurement of Steady State thermal Transmission, the panels shall provide a k factor of 0.14 btu/sf/hr/deg F at a 75° F (24° C) mean temperature.

2.3 INSULATED METAL WALL PANELS

A. Basis of Design:
1. MBCI, Fire Resistant Panel
2. Zinc Metallic Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS Grade 37, G90 (Z275), structural quality.
3. G-90 galvanized coated steel conforming to ASTM A 653 and/or AZ50 aluminum-zinc alloy coated steel, conforming to ASTM A 792/A 792M, minimum grade 33, prepainted by the coil-coating process per ASTM A 755/A 755M.
4. Exterior Face Sheet: 26 gauge coated thickness, with smooth surface.
5. Interior Face Sheet: 26 gauge coated thickness, with smooth surface profile.

B. Panel Width: 42 inches.

C. Panel Thickness: 4 inches. As required to meet performance requirements.

D. Heat Transfer Coefficient (U-factor): [insert corresponding value] Btu/hr * sq. ft. * deg. F (W/K * sq. m) as determined by ASTM C 1363 at 75 degrees Fahrenheit mean temperature. Tested specimen must include at least two engaged side joints.

2.4 METAL WALL PANEL ACCESSORIES

A. General: Provide complete metal panel assemblies

B. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Provide corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.

2.5 FABRICATIOIN

A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.

B.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.

B. Inspect framing that will support insulated metal panels to determine if support components are installed as indicated on approved shop drawings and are within tolerances acceptable to metal panel manufacturer and installer. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.

C. Panel Support Tolerances: Confirm that metal panel supports are within tolerances acceptable to metal panel manufacturer

D. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

3.2 METAL PANEL INSTALLATION

A. Exposed-Fastener, Bonded Fire-Resistant-Thermal-Insulation-Core Metal Wall Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place.

B. Attach panels to metal framing using screws, fasteners, sealants, and adhesives recommended for application by metal panel manufacturer.

C. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer.

D. Cut panels in field where required using manufacturer's recommended methods.

E. Provide weatherproof jacks for pipe and conduit penetrating metal panels.

F. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.

G. Attach, and perimeter joints using joint sealers indicated in manufacturer's instructions.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. No separate measurement will be made for Insulated Fire Resistant Metal Wall Panels.

B. Full compensation for Insulated Fire Resistant Metal Wall Panels will be considered to be include in the lump sum bid price paid for diesel generator and no separate payment will be made therefor. Payment shall include full compensation for furnishing and placing all material, equipment, and labor necessary to satisfactorily for doing all the work to install the insulated fire resistant metal wall panels as shown in contract drawing, including but not limited to drilled and bond dowel into the existing concrete pad as required and specified in these specifications, and as directed by the Engineer.

END OF SECTION 00 4300

REPORT
GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

for
The Town of Woodside

April 2016

BAGG ENGINEERS

BAGG Engineers, copyright October 2015

April 12, 2016
BAGG Job No: WOODS-16-01

Town of Woodside
2955 Woodside Road
Woodside, California 94062

Attention: Ms. Sindhi Mekala

Geotechnical Engineering Investigation
Town Center Sanitary Sewer Pump Station Improvements
2995 Woodside Road
Woodside, California

Dear Ms. Mekala:

Transmitted herewith is our geotechnical engineering investigation report concerning the renovation of the existing town center sanitary sewer pump station in Woodside, California. The following report summarizes the results of our subsurface exploration and laboratory testing, which formed the basis of our conclusions, and presents our recommendations related to the geotechnical engineering aspects of the proposed pump station improvements.

Recommendations presented in this report do not pertain to geologic hazards due to strong nearby seismic events. These hazards include those caused by lateral spread and ground rupture. Additional comments pertaining to these hazards are presented in this report.

Thank you for the opportunity to perform these services. Please do not hesitate to contact us, should you have any questions or comments.

Very truly yours,
BAGG Engineers

REGISTERED PROFESSIONAL ENGINEER
ANTHONY NICHOLAS LUSICH
NO. 546
GEOTECHNICAL
STATE OF CALIFORNIA

Evan Wolf
Project Geologist

Anthony N. Lusich, PE, GE, F.ASCE
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REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED TOWN CENTER SANITARY SEWER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

For the Town of Woodside

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BVGG ENGINEERS

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ASFE document titled “Important Information About Your Geotechnical Engineering Report”

REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED TOWN CENTER SANITARY SEWER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

For the Town of Woodside

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering investigation performed to address the proposed renovation of the existing town center sanitary sewer pump station at 2995 Woodside Road in Woodside, California. The attached Plate 1, Vicinity Map, shows the general location of the site; Plate 2, Site Plan, shows the existing site layout, proposed improvements and the boring location advanced by BAGG as part of this investigation.

Recommendations in this report do not address seismic hazards such as lateral spread and ground rupture. We understand that, due the high cost of mitigating these hazards, such mitigation would not be a part of this project.

2.0 SITE AND PROJECT DESCRIPTION

The subject site consists of a gently sloping to relatively flat, approximately 15 to 20 foot wide, irregular shaped easement encompassing the existing town center sanitary sewer pump station and a portion of the associated sanitary sewer system. The subject site is situated within a relatively low lying area immediately northeast of Bear Creek, at the southeast corner of the intersection of Woodside Road, Cañada Road and Mountain Home Road. The site is approximately one mile southwest of Interstate 280 at its overcrossing with Woodside Road in Woodside, California. The site is bordered by an existing driveway and parking area to the north, Bear Creek to the south, developed properties to the east and Mountain Home Road to the west. Slopes in the vicinity of the existing sanitary sewer pump station descend toward Bear Creek at an approximate inclination of 1:1 (H:V).

The site is currently developed with an operating sanitary sewer pump station consisting of a fenced in area containing an approximately 16-foot deep, 6-foot diameter wet well, and an approximately 88 square-foot raised concrete pad housing the associated pump equipment. The pump station is accessed by a sloping asphalt driveway which descends to the gated entry to the pump station from the parking area to the north. Two sanitary sewer manholes exist within and adjacent to the northern portion of the driveway area. Underground pipes lead from the sewer manholes to the existing wet well and pump equipment within the pump station. A majority of the site and the surrounding area are covered with a combination of concrete and asphaltic concrete pavement.

It is our understanding that the proposed project will consist of renovating the existing town center sanitary sewer pump station and improving a portion of the existing sanitary sewer system. As part of the renovation it is proposed to construct an approximately 26-foot deep, 6-foot diameter wet well in the central portion of the sloping driveway area north of the existing pump station, a new sanitary sewer manhole on the upslope portion of the driveway area and replacing portions of the existing underground plumbing. The project will also include the construction an approximately 2- to 4-foot tall timber lagging retaining wall to accommodate the grade change between the driveway area and elevated parking area to the east and the construction of an approximately 16 square-foot raised concrete pad adjacent to the existing raised concrete pad within the pump station. The entire site, with the exception of minor landscape areas, will receive asphalt pavement.

As part of the renovation it is also proposed to remove the existing manhole at the northernmost portion of the driveway area, rehabilitate the existing wet well, and replace the existing pump equipment and generator. The existing pump station housing is to remain

3.0 PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to obtain pertinent information regarding subsurface soil and groundwater conditions at the location of the proposed improvements. This was accomplished by advancing one boring with a truck-mounted drill rig to approximately 28 feet below the ground surface. Soil samples were obtained from the boring at 3- to 5-foot intervals, and a laboratory testing program was performed to evaluate the engineering characteristics of the collected soil samples. Information

obtained from these tasks was used to perform engineering analysis required to develop conclusions, opinions, and recommendations regarding:

- site seismicity, including appropriate soil profile type and parameters for seismic design per the 2013 Edition of the California Building Code (CBC),
- specific soil and groundwater conditions discovered by our boring, such as loose, expansive, saturated, or collapsible soils, that may require special mitigation or impose restrictions on the project, including the thickness and consistency of any fill soils encountered at the site,
- criteria for the support of the proposed structures, including allowable bearing pressures for both static and seismic conditions,
- criteria for design of temporary shoring and allowable excavation slopes,
- estimate of the static construction and post-construction total and differential settlements for the new improvements,
- design of flexible and rigid (PCC) pavements using various Traffic Indices,
- general provisions for the control of surface and subsurface drainage

Our work did not include addressing seismically related hazards such as lateral spread and ground rupture. Significant damage may occur due to these hazards at this site.

Based on our understanding of the project, the scope of our services consisted of the following specific tasks:

1. Researched and reviewed pertinent geotechnical and geological maps and reports relevant to the site and vicinity.
2. Marked the boring location at the site at least 72 hours in advance of the subsurface exploration, and notified Underground Service Alert to mark utility lines on or entering the site.
3. Obtained the required drilling permit from San Mateo County.
4. Drilled, logged, and sampled one exploratory boring to a depth of approximately 28 feet below the ground surface. The soil boring was drilled using a truck mounted drilling rig which was equipped with 8-inch outer diameter hollow stem augers. The boring was drilled under the technical direction of one of our geologists, who also obtained

relatively undisturbed samples of the native soils for visual classification and laboratory testing. Following the completion of the drilling, the boring was sealed with neat cement grout as required by San Mateo County.

5. Performed a laboratory testing program on the collected soil samples to evaluate the engineering characteristics of the subsurface soil which included determining the plasticity index, consolidation characteristics, gradation, dry density and in-situ moisture content of selected samples.

6. Based on information obtained from the above tasks, we performed engineering analyses oriented toward the above-described purpose of the investigation.

7. Prepared four copies of a report summarizing our findings and including a vicinity map, a site plan showing the approximate location of the exploratory boring, a vicinity geologic map, a regional fault map, the boring logs, the results of our laboratory testing, and our conclusions, opinions, and recommendations for design and construction of the project.

4.0 FIELD EXPLORATION

We explored the subsurface conditions at the site by drilling one exploratory boring to a depth of approximately 28 feet below the existing ground surface on March 11, 2016. The soil boring was drilled using a truck-mounted drilling rig equipped with 8-inch diameter hollow stem augers. One of our geologists technically directed the exploration, maintained a continuous log of the boring, and obtained Standard Penetration test and relatively undisturbed ring samples for laboratory testing and visual examination.

The graphical representation of the materials encountered in the boring, and the results of laboratory tests as well as explanatory/illustrative data are attached, as follows:

- Plate 5, Unified Soil Classification System, illustrates the general features of the soil classification system used on the boring logs.
- Plate 6, Soil Terminology, lists and describes the soil engineering terms used on the boring logs.
- Plate 7, Rock Terminology, lists and describes the bedrock engineering terms used on the boring logs.
- Plate 8, Boring Log Notes, describes general and specific conditions that apply to the boring logs.

- Plate 9, Key to Symbols, describes general and specific conditions that apply to the boring logs, and defines symbols used on the boring logs.

- Plate 10, Boring Logs, describe the subsurface materials encountered, show the depths and blow counts for the samples, and summarize the results of the laboratory tests.

5.0 GEOLOGY AND SEISMICITY

5.1 Regional Geology

A review of the "Geology of the Onshore Part of San Mateo County, California: Derived From the Digital Database Open-File 98-137" by E.E. Brabb, R.W. Graymer, and D.L. Jones, 1998, indicates that the site is underlain by the Whiskey Hill Formation (middle and lower Eocene). The Whiskey Hill Formation is described as consisting of light-gray to buff coarse-grained arkosic sandstone, with light-gray to buff silty claystone, glauconitic sandstone, and tuffaceous siltstone which are locally chaotically disturbed. In the area of the proposed improvements the Whiskey Hill Formation is likely overlain by Holocene age alluvial deposits due to its proximity to Bear Creek. The alluvial deposits likely consist of various mixtures of clay, sand, silt and gravel that are poorly to well sorted and poorly consolidated A portion of that map including the site area is presented herein as the Regional Geology Map, Plate 3.

5.2 Seismic Setting

The site and the San Francisco Bay Area lie within the Coast Ranges geomorphic province, a series of discontinuous northwest trending mountain ranges, ridges, and intervening valleys characterized by complex folding and faulting. These faults are in a zone that extends eastward from off the Pacific Coast through the San Francisco Bay area to the western side of the Great Valley. This region has one of the highest rates of seismic moment release per square mile of any urban area in the United States. It is emerging from the stress shadow of the 1906 San Francisco Earthquake and future large earthquakes are considered a certainty.

Three, northwest-trending major earthquake faults that comprise the San Andreas fault system, extend through the Bay Area. They include the San Andreas fault, the Hayward-Rodgers Creek fault, and the

Calaveras fault, respectively located approximately 1.25 km (0.8 miles) west-southwest, 28.4 km (17.6 miles) northeast, and 37.6 km (23.4 miles) east-northeast of the site.

The subject site is situated within an Alquist-Priolo Earthquake Fault Zone designated by the California Geological Survey, due to its proximity to an approximately located trace of a fault within the San Andreas Fault Zone, located approximately 200 feet west-southwest of the subject site. Since the project consists of improvements to a non-inhabitable structure, a geologic investigation demonstrating the absence of a surficial displacement threat was not conducted as part of this exploration.

The San Andreas and Hayward-Rodgers Creek faults are believed to be the principal seismic hazards in this area because of their activity rates and proximity to the site. The Working Group on California Earthquake Probabilities (2014) has estimated that the probability for a major earthquake (M_W 6.7 or greater) within 30 years on the nearby Peninsula Section of the San Andreas fault is about 7 percent and about 33 percent for a similar earthquake located anywhere on the northern San Andreas Fault. The working Group on California Earthquake Probabilities (2014) has estimated that the probability for a major earthquake (M_W 6.7 or greater) within 30 years on the nearby southern Hayward fault is about 22 percent about 32 percent for a similar earthquake located anywhere on the Hayward-Rodgers Creek fault.

Other significant regional faults are of greater distance, or have lesser probabilities of a major earthquake in the next 30 years or so. Of particular importance are the Calaveras, Monte Vista-Shannon, Pilarcitos, San Gregorio, and Silver Creek faults located approximately 37.7 km (23.4 miles) east-northeast, 1.1 km (0.7 miles) east-northeast, 3.6 km (2.25 miles) southwest, 15.6 km (9.7 miles) west-southwest and 26.9 km (16.7 miles) east-northeast of the subject property, respectively. The Calaveras fault reportedly has an 8 percent probability, the Monte Vista-Shannon fault reportedly has a 0.9 percent probability, the Pilarcitos fault reportedly has a 0.25 percent probability, the San Gregorio fault reportedly has a 3.4 percent probability and the Silver Creek fault reportedly has a 0.2 percent probability for a magnitude 6.7 or greater earthquake in 30 years.

The predominant seismic hazard at this site will be from shaking caused by a large earthquake. ABAG (Association of Bay Area Governments) has published earthquake intensity maps that indicate the

scenario earthquake listed for the entire northern San Andreas Fault (1906-size earthquake) would produce a “violent” shaking intensity, and the Peninsula Segment of the San Andreas Fault would produce a “violent” shaking intensity at the site. The shaking resulting from a scenario earthquake on the Hayward-Rodgers Creek fault will be “moderate” in nature, and southern segment of the Hayward fault would produce "moderate" shaking intensity at the site. The shaking resulting from a scenario earthquake on the Calaveras fault will be "light" to “moderate” in nature and the shaking resulting from a scenario earthquake on the San Gregorio fault will be “strong” in nature.

The distances to the major active faults from the project site and the estimated probability of a $M_W \geq 6.7$ within 30 years for each fault are listed on the following table.

Table 1
Distance and Estimated Probabilities of Magnitude 6.7 Earthquake

Fault	Distance from the Site (miles)	Direction	Estimated Probability of Magnitude 6.7 Earthquake
Monte Vista-Shannon	0.7	E-NE	0.9%
San Andreas (Entire)	0.8	W-SW	33%
San Andreas (Peninsula)	0.8	W-SW	7%
Pilarcitos	2.25	SW	0.25%
San Gregorio	9.7	W-SW	3.4%
Silver Creek	16.7	E-NE	0.2%
Hayward-Rodgers Creek	17.7	NE	32%
Hayward (South)	17.7	NE	22.3%
Calaveras (North)	23.4	E-NE	8%

5.3 Soil Liquefaction

Soil liquefaction is a condition where saturated granular soils near the ground surface undergo a substantial loss of strength due to increased pore water pressure resulting from cyclic stress applications induced by earthquakes or other vibrations. In the process, the soil acquires mobility sufficient to permit both vertical and horizontal movements, if not confined. Soils most susceptible to liquefaction are loose, uniformly graded, fine-grained, sands, and loose silts with very low cohesion. In general,

liquefaction hazards are most severe in the upper 50 feet of the soil profile. In the deeper deposits the overburden soils tend to isolate the ground surface from any liquefaction and the overburden pressures tends to limit shear strains that occur during liquefaction.

A seismic hazard zone map for the site has not yet been generated by the State of California; however, the liquefaction susceptibility of the site is considered “low” near the northern portion of the site and "very high” within and adjacent to Bear Creek according to the Association of Bay Area Governments.

Engineering analysis was performed to evaluate liquefaction potential at the site and to estimate seismic settlements during a design-level earthquake on one of the nearby faults. There is no known history of liquefaction induced damage at the site.

The liquefaction potential evaluation was performed using the data collected from the subsurface exploration at the site. The liquefaction analysis was performed using the depth to groundwater value of 11 feet as measured during our subsurface exploration at the site on March 11, 2016.

Assuming the depth to groundwater at the site to be 11 feet bgs, the peak ground acceleration at the site to be 0.78 (S_{DS}/2.5) generated by an earthquake of moment magnitude 7.37 on the nearby San Andreas Fault, the total liquefaction related settlement was calculated to be on the order of ¾ to 1½ inches using the methodology suggested by Cetin et al., 2009. The differential settlement should be anticipated to be approximately ⅔ the total anticipated settlement.

Due to its proximity to the north bank of Bear Creek, the site may experience significant lateral spreading during a seismic event on nearby faults resulting in significant damages of subsurface and at-grade improvements.

5.4 CBC 2013 Seismic Design Parameters

A seismic hazard analysis was performed for the subject site using the USGS “Seismic Design Maps and Tools" website (http://earthquake.usgs.gov/designmaps/us/application.php). The “mapped” values generally represent firm bedrock shaking with a 2 percent probability of being exceeded in a 50-year period. The values are then modified for a given site based on a broad classification of the soil profile at the site.

Within the upper 50 feet, the site has an average N value (Standard Penetration Test blow count) greater than 50; the soil profile at the site is therefore classified as a Class "C", site defined as a "Very Dense Soil and Soft Rock" profile with an average shear wave velocity in the range of 1,200 to 2,500 feet per second, average Standard Penetration Test (N) values greater than 50, and/or average undrained shear strength greater than 2,000 psf in the top 100 feet of the soil profile.

Using the site coordinates of 37.42907° North Latitude and 122.25367° West Longitude, earthquake ground motion parameters were computed in accordance with 2013 California Building Code are as listed in the following table.

Table 2
Parameters for Seismic Design

2010 CBC Site Parameter	Value
Site Latitude	37.42907° N
Site Longitude	122.25367° W
Site Class, Table 1613.5.2	Very Dense Soil and Soft Rock, Class C
Mapped Spectral Acceleration for Short Periods S_s	2.917 g
Mapped Spectral Acceleration for a 1-second Period S_1	1.183g
Site Coefficient F_a	1.0
Site Coefficient F_v	1.3
Site-Modified Spectral Acceleration for short Periods S_{Ms}	2.917g
Site-Modified Spectral Acceleration for a 1-second Period S_{M1}	1.537 g
Design Spectral Acceleration for short Periods S_{Ds}	1.945g
Design Spectral Acceleration for short Periods S_{D1}	1.025g

6.0 SITE CONDITIONS

6.1 Subsurface Conditions

The exploration areas for this investigation were surfaced with approximately 3-inches of asphalt pavement. The subsurface exploration at the site did not reveal the presence of fill materials in the immediate vicinity of the boring. However, variable thicknesses of trench backfill materials are present

in the vicinity of the existing utility and sewer lines at the site. The subsurface earth materials encountered as a part of this investigation consisted of alluvial sediments extending to a depth of approximately 24 feet below the ground surface in the vicinity of the existing sanitary sewer pump station. The upper 11 feet of the alluvial materials encountered consisted of predominantly clay-rich sediments with a medium to high plasticity. Below a depth of approximately 11 feet predominantly granular alluvial materials were encountered. The granular alluvial materials encountered are described as consisting of yellow-brown to orange-brown and olive-gray silty sand, silty sand with gravel, clayey sand and clayey sand with gravel that are medium dense to very dense and moist to very moist.

Bedrock of the Whiskey Hill Formation was encountered at a depth of approximately 24 feet below the existing ground surface. The bedrock materials encountered are described as consisting of dark gray claystone that is slightly weathered, extremely to very closely fractured, firm and apparently thickly to massively bedded. For more information regarding the subsurface materials, we refer you to the boring logs on Plate 10.

6.2 Groundwater

Free groundwater was encountered at a depth of approximately 11 feet below the existing ground surface within the boring advanced for this investigation. This depth of groundwater coincides with the granular material at that depth.

However, it should be noted that groundwater levels typically fluctuate due to variations in rainfall, temperature, and other factors not evident at the time of the exploration. Due to the interbedded and interfingering nature of alluvial sediments it is also likely that fluctuations in the groundwater level and/or perched water conditions may occur across the site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 General

Based on the subsurface exploration conducted at the subject property, it is our opinion that the proposed project is feasible from a geotechnical engineering standpoint, provided the recommendations presented in this report are incorporated into the project design and implemented during construction.

It should be noted that the site could experience violent ground shaking from future earthquakes during the anticipated lifetime of the project. The intensity of ground shaking will depend on the magnitude of earthquake, distance to epicenter, and response characteristics of the on-site soils. pipelines, retaining walls and other improvements may be damaged by a nearby major seismic event.

Due to the potential for significant damage due to geologic hazards, consideration should be given to designing and constructing the station so that any damage will result in as little release of effluent as practical and so that the station will be put back into operation as soon as practical.

Mitigation of the potential damage due to lateral spreads could consist of placing sufficient number of vertical piles to resist lateral movement or removing the existing soil to depths in excess of 10 to 15 feet and replace it with geogrid reinforced or cement treated soil.

Mitigation of improvements due to ground rupture usually consists of adhering to setback limits from a fault. However, in this case, there is no option for relocating the station in another portion of the site that would comply with the restrictions of setback.

Adherence to good engineering design and construction practices will help reduce the risk to damage. The California Building Code provides the minimum requirements of good engineering design and construction practices.

The main concerns at the site will be in regards to seismically induced liquefaction and lateral spreading and ground rupture during a seismic event on the San Andreas Fault and/or other nearby faults. The total liquefaction related settlement was calculated to be on the order of ¾ to 1½ inches using the methodology suggested by Cetin et al., 2009. The differential settlement should be anticipated to be approximately ⅔ the total anticipated settlement. Lateral spreading may also occur along the unconfined banks of Bear Creek, south of the subject site.

Based on the results of our subsurface exploration, it is our opinion that the sanitary sewer pump station equipment can be supported on a conventional slab on grade and the site retaining wall may be supported on drilled, cast-in-place, reinforced concrete piers. Excavations for the proposed wet well

and sewer manholes will likely encounter granular soils below the groundwater table and will therefore need to be cased to prevent caving during construction.

Small pads, such as those for a generation or control cabinet, could be supported on shallow foundations. Alternatively, these improvements could be supported on drilled piers. Such supports might facilitate returning the station back in operation as soon as practical after damage by a seismic event.

Our recommendations for site grading, foundations, slabs-on-grade, flexible and rigid pavements, drainage, and utility trench backfill are presented in the following sections of the report.

When the final development plans are available, they should be reviewed by this office prior to construction to confirm that the intent of our recommendations are reflected in the plans, and to confirm that our recommendations properly address the proposed project in its final form.

7.2 Site Grading

It our understanding that site grading will include minimal changes in elevation with the exception of excavation for the new wet wells and associated plumbing. The grading procedures listed below should be followed in areas to receive fill, pavements, concrete slabs, or flatwork:

- The existing structures and the associated footings, slabs, and utilities to be abandoned should be completely removed and disposed off-site.
- The removed AC pavement may be pulverized to a maximum size of two inches and reused as engineered fill.
- Temporary excavations deeper than 5 feet will either have to be sloped back at an inclination flatter than 1H:1V or will have to be shored.
- The exposed surfaces should be scarified to depths of 8 inches, uniformly moisture conditioned to slightly above optimum moisture content and compacted to a minimum of 90 percent relative compaction, as determined by ASTM D1557. Further over-excavate, as necessary, any area still containing weak or unsuitable material, as determined in the field by the Geotechnical Engineer.

- Place fill on the prepared surfaces created by the above actions in uniformly moisture conditioned and compacted lifts not exceeding 8 inches in loose thickness. Rocks or cobbles larger than 3 inches in maximum dimensions should not be allowed to remain within the foundation areas, unless they can be crushed in-place by the construction equipment. Imported fill material should be compacted to a minimum of 90 percent relative compaction at slightly above optimum moisture content. On-site soils should be compacted as specified above.

The native soils are suitable for use as structural fill. Imported fill soils if needed, should be predominately granular in nature and should be free of organics, debris, or rocks over 3 inches in size, and should be approved by the Geotechnical Engineer before importing to the site. As a general guide of acceptance, imported soils should have a Plasticity Index less than 15, and an R-value of at least 20, and fines content between 15 and 60 percent. All aspects of site grading including clearing/stripping, demolition, building pad preparation, and placement of fills or backfills should be performed under the observation of BAGG's field representatives.

It must be the Contractor's responsibility to select equipment and procedures that will accomplish the grading as described above. The Contractor must also organize his work in such a manner that one of our field representatives can observe and test the grading operations, including clearing, excavation, compaction of fill and backfill, and compaction of subgrades.

7.3 Retaining Walls

Retaining walls should be designed to resist lateral earth pressures from adjoining natural materials and backfills. Free standing walls supporting native materials should be designed to resist active lateral pressures taken as an equivalent fluid pressure of 45 pounds per cubic foot (pcf) for level backfill. The above-recommended earth pressures are for level backfill conditions. Traffic surcharge loads should be added to the above pressures as a uniform load equivalent to 2 feet of soil (250 psf).

The seismic pressures on the retaining walls may be simulated by a rectangular pressure distribution equal to 10H, where H is the height of the wall. However, the walls and support piers may be subject to lateral movement towards the creek due to a strong seismic event.

Retaining walls can be supported on drilled, cast-in-place, reinforced concrete piers designed as recommended in the "Foundations" section of this report.

The above lateral pressures do not include any hydrostatic pressures resulting from groundwater, seepage water, or infiltration of natural rainfall and/or irrigation water behind the walls. Therefore, the retaining wall lagging should be spaced such that subsurface water accumulating behind the wall may freely drain through the spaces between the lagging. To facilitate drainage, the retaining wall should be backfilled with Caltrans Class 2 Permeable material or free-draining gravel encapsulated by a suitable filter fabric. A 4-inch-diameter perforated PVC pipe may also be installed at the base of the drainage layer to facilitate removal of water collected behind the wall.

General backfill behind the walls, excluding drainage materials, should conform to the fill requirements included under the "Site Grading" section of this report.

7.4 Foundations

These recommendations pertain to static conditions. Significant damage may occur due to lateral spread due to lateral spread towards Bear Creek.

7.4.1 Conventional Shallow Footings

Structural loads from the concrete pad housing the generation or control cabinet may be satisfactorily supported upon conventional spread footing foundations. The footings should be established a minimum of 18 inches below the lowest adjacent exterior grade. Footings established in this manner, may be sized using an allowable bearing pressure of 1,000 psf for dead and 1,500 psf for total design loads. The latter value may be increased by one-third for short-term wind and seismic loads. These allowable bearing values are net values; therefore, the weight of the below-grade portion of the footing can be neglected for design purposes. The footings established in the above manner should have a minimum width of 12 and 24 inches for continuous and isolated footings, respectively. The footings should be appropriately reinforced with top and bottom reinforcing steel, and designed in consideration of the projected differential settlements across the building (see Section 7.5 - Settlements).

The bottom of footing excavations should be firm, clean, and free of any loose or yielding soils. To the extent possible, footings should be poured in neat excavations without the use of side forms. The soils exposed in the excavations should be kept moist to minimize sloughing before concrete placement. Concrete should be placed as soon as possible in the footing trenches because any unsupported trench walls exposing granular soils may cave due to the presence of cohesionless soils.

Lateral resistance may be obtained from friction acting on the bottom of the foundation, and from passive earth pressures acting on the sides of the footings that have been poured in neat excavations. The allowable passive resistance for wind or seismic loads can be taken as an equivalent fluid pressure of 350 pcf. Passive resistance may be assumed to act full depth of embedment. Additionally, a frictional coefficient of 0.35 may be assumed to act along the bottom of footings in conjunction with passive resistance.

When excavating for the utility line placement adjacent to the proposed structures, building foundations must be protected from being undermined and damaged by the construction activities. Utility trenches located adjacent to new footings should be established above an imaginary plane projected downward at 1H:1V from the edge of the existing foundations.

7.4.2 Drilled Piers

Non restrained retaining walls supporting a level surcharge may be supported on drilled, cast-in-place, reinforced concrete piers may be used to support the proposed timber lagging retaining wall, provided they are founded in stiff/dense alluvial soils. Drilled piers should be 18 inches in diameter and extend a minimum of 4 feet into firm alluvial materials. Piers for the retaining wall should be tied in one direction with a grade beam.

As an alternative to conventional shallow footings, the concrete pad housing the generator and control cabinet may be supported on drilled, cast in place, reinforced piers. Drilled piers for the proposed concrete pad should be founded in stiff/dense alluvial soils. Drilled piers should be 18 inches in diameter and extend below an imaginary 2:1 creep plane projected up from the bottom of the creek bank adjacent to Bear Creek. The depth to the creep plane is approximately four (4) feet and one (1) foot for the southern and northern portions of the concrete pad, respectively. Therefore, piers

supporting the southern portion of the concrete pad should extend a minimum of 8 feet below the lowest adjacent grade and piers for the northern portion of the concrete pad should extend a minimum of 2 feet below the lowest adjacent grade. If desired, the existing concrete pad within the pump station may be underpinned to the same depths to limit differential settlement between the two concrete pads. Underpinning the existing slab may also help to reduce damage to the pump station equipment and therefore facilitate returning the station back to operation as soon as practical after damage by a seismic event.

The bottom of pier excavations should be firm, clean, and free of any loose or yielding soils. To the extent possible. The soils exposed in the excavations should be kept moist to minimize sloughing before concrete placement. Concrete should be placed as soon as possible in the footing excavations because any unsupported excavation walls exposing granular soils may cave due to the presence of cohesionless soils.

Lateral resistance may be obtained from passive earth pressures acting on the sides of the footings that have been poured in neat excavations or cast and backfilled with compacted fill. The allowable passive resistance for seismic loads can be taken as an equivalent fluid pressure of 350 pcf. Passive resistance may be assumed to act full depth of embedment.

7.5 Settlement

Given the relatively light loads and the generally stiff subsurface soil profile present at the site, we estimate settlement during construction due to ground water withdrawal and post-construction to be on the order of about 1 inch or less provided the grading recommendations presented above are adhered to. Differential settlement is expected to be about half this value.

7.6 Slabs-on-Grade and Exterior Flatwork

Any concrete slabs should be constructed on a well compacted and moisture conditioned soil subgrade. The slab should be reinforced as per the project Structural Engineer's recommendations. The subgrade should be approved by the Geotechnical Engineer immediately before the slab is poured.

7.7 Drainage

The ground surface adjacent to the sanitary sewer pump station and site retaining wall should be sloped to drain away from the structures. Drainage swales should be incorporated into the grading plan, and designed to provide sufficient slope from the structures (5% minimum for at least 5 feet from the face of the building and foundations in unpaved areas) toward appropriate discharge points. Any area where surface run-off becomes concentrated should be provided with a catch basin that discharges the collected runoff in a manner that will not cause erosion.

The run-off from building roofs and intercepted water from surface drainage should be collected and discharged to suitable outfall locations in a manner that will not allow ponding adjacent to foundations. Surface and subsurface drainage facilities and catchment areas should be checked frequently and cleaned or maintained throughout the project life, as necessary.

7.8 Flexible Pavements

In general, the surficial soil conditions at the site consist of stiff sandy clay. Based on the clay-rich nature of the near surface soils, for design purposes we have assumed a subgrade R-value of 30 to develop the preliminary pavement sections tabulated below.

Table 3
Flexible Pavement Sections
(Subgrade R-Value=30)

Pavement Component	**TI = 4.5**	
Asphaltic Concrete (AC) in inches	5	3
Class II Aggregate Base (R_{Min}=78) in inches	--	4
Total Thickness in inches	5	7

The above pavement sections were calculated using the procedure described in the CalTrans Highway Design Manual, Topic 604, December 20, 2004. The design pertains to a life expectancy for the pavements of 20 years.

All materials and construction procedures, including placement and compaction of pavement components, should be performed in conformance with the latest edition of the CalTrans Standard Specifications, except that compaction should be performed in accordance with ASTM Test Method D1557. The aggregate baserock and the asphalt concrete layers should be compacted to a minimum of 95 percent relative compaction while at moisture content that is a minimum of 3 percent above optimum.

7.9 Trench Backfill

Vertical trenches deeper than 5 feet will require temporary shoring. Where shoring is not used, the height of the vertical excavation should be reduced to 4 feet and the sides should be sloped or benched, with a maximum slope of 1½:1 (horizontal: vertical). The trench spoils should not be placed closer than 3 feet or one-half of the trench depth (whichever is greater) from the trench sidewalls. All work associated with trenching must conform to the State of California, Division of Industrial Safety requirements. In our opinion, the soils in the upper 10 to 15 feet of the site should be classified as "Type B Soil."

Trench backfill materials and compaction should conform to the requirements of the local agency; however, we recommend the following as a minimum:

- In general, soils used for trench backfill shall be free of debris, roots and other organic matter, debris, and rocks or lumps exceeding 4 inches in greatest dimension. The on-site soils can be used for trench backfill.
- Compaction shall be performed to a minimum of 90% relative compaction in accordance with ASTM D1557, at a moisture content recommended previously. In pavement areas, the upper 12 inches of the backfill (below the pavement subgrade) shall be compacted to 95% of the maximum dry density. Jetting shall not be allowed.

7.10 Plan Review

It is recommended that the Geotechnical Engineer (BAGG Engineers) be retained to review the final grading, foundation, and drainage plans. This review is to assess general suitability of the earthwork, foundation, and drainage recommendations contained in this report and to verify the appropriate implementation of our recommendations into the project plans and specifications.

7.11 Observation and Testing

It is recommended that the Geotechnical Engineer (BAGG) be retained to provide observation and testing services during site grading, excavation, backfilling, and foundation construction phases of work. This is intended to verify that the work in the field is performed as recommended and in accordance with the approved plans and specifications, as well as verify that subsurface conditions encountered during construction are similar to those anticipated during the design phase.

8.0 CLOSURE

This report has been prepared in accordance with generally-accepted engineering practices. The recommendations presented in this report are based on our understanding of the proposed construction as described herein, and upon the soil conditions encountered in the soil boring drilled for this investigation.

The conclusions and recommendations contained in this report are based on subsurface conditions revealed by one soil boring and a review of available geotechnical and geologic literature pertaining to the project site. It is not uncommon for unanticipated conditions to be encountered during site grading and/or foundation installation and it is not possible for all such variations to be found by a field exploration program appropriate for this type of project. The recommendations contained in this report are therefore contingent upon the review of the final grading, drainage, and foundation plans by this office, and upon geotechnical observation and testing by BAGG of all pertinent aspects of site grading, including demolition, placement of fills and backfills, and foundation construction.

Soil conditions and standards of practice change with time. Therefore, we should be consulted to update this report, if the construction does not commence within 18 months from the date that this report is submitted. Additionally, the recommendations of this report are only valid for the proposed development as described herein. If the proposed project is modified, our recommendations should be reviewed and approved or modified by this office in writing.

The following references and plates are attached and complete this report:

Plate 1	Vicinity Map
Plate 2	Site Plan
Plate 3	Regional Geologic Map
Plate 4	Regional Fault Map
Plate 5	Unified Soil Classification System
Plate 6	Soil Terminology
Plate 7	Rock Terminology
Plate 8	Boring Log Notes
Plate 9	Key to Symbols
Plate 10	Boring Logs
Plate 11	Gradation Test Data
Plate 12	Plasticity Data
Plate 13	Consolidation Test Data

ASFE document titled "Important Information About Your Geotechnical Engineering Report"

9.0 REFERENCES

Brabb, E.E., Graymer, R.W., Jones, D.L., 1998, Geology of the Onshore Part of San Mateo, County California: A Digital Database, Open-File Report 98-137.

California Building Standard Commission, 2013 California Building Code, California Code of Regulations, Title 24, Part 2, Column 2 of 2.

California Department of Conservation, Division of Mines and Geology, 2000, Digital Images of Official maps of Alquist-Priolo Earthquake Fault Zones of California, Central Coast Region.

Uniform California Earthquake Rupture Forecast (Version 3) (UCERF3): A New Earthquake Forecast for California's Complex Fault System (March 2015)

Field, E.H., Biasi, G.P., Bird, P., Dawson, T.E., Felzer, R.F., Jackson, D.D., Johnson, K.M., Jordon, T.H., Madden, C., Michael, A,J., Milner, K.R., Page, M.T., Parsons, T., Powers, P.M., Shaw, B.E., Thatcher, W.R., Weldon II, R.J., Zeng, Y, Long-Term Time-Dependent, Probabilities for Third Uniform California Earthquake Rupture Forecast (UCERF3), Bulletin of the Seismological Society of America, Vol. 105, No. 2A, pp. 511-543, April 2015.

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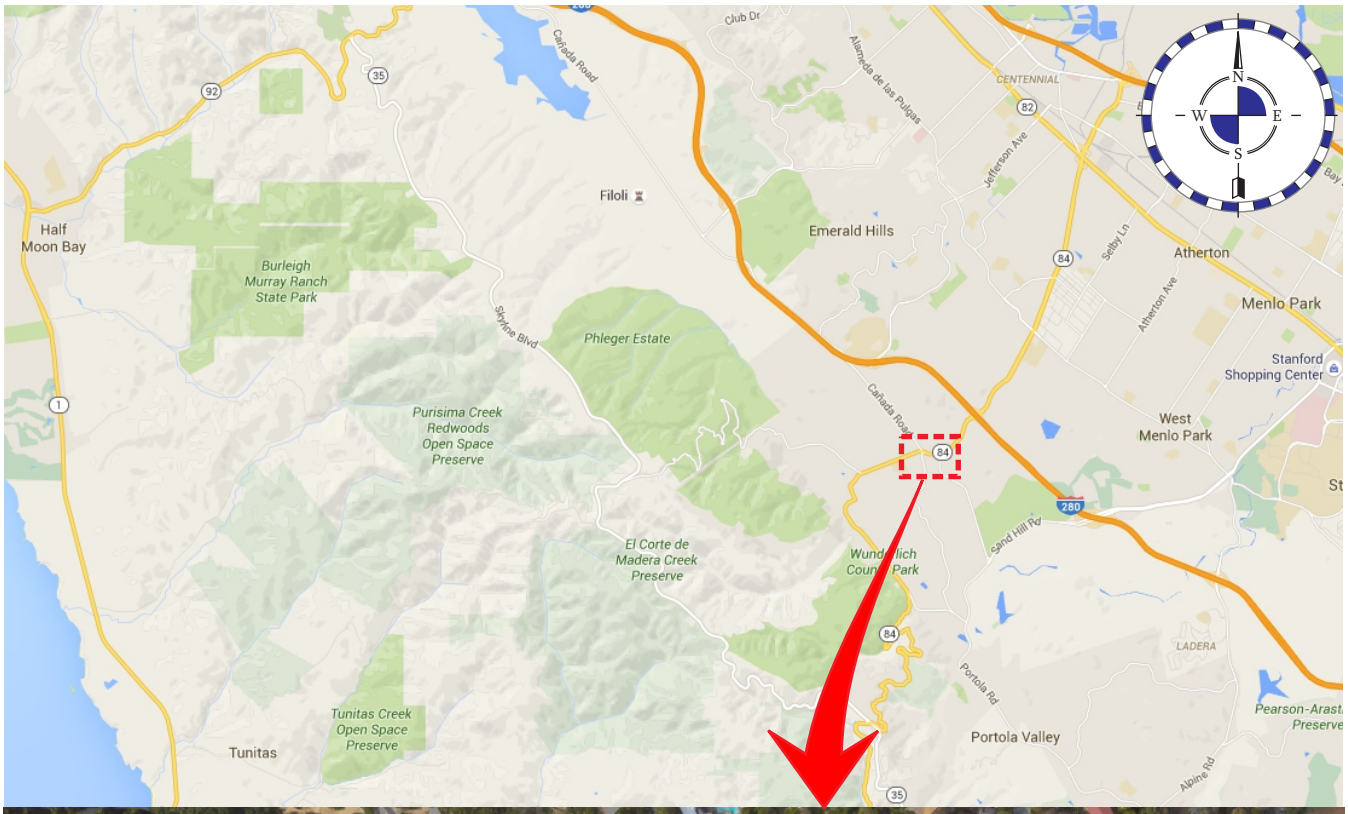
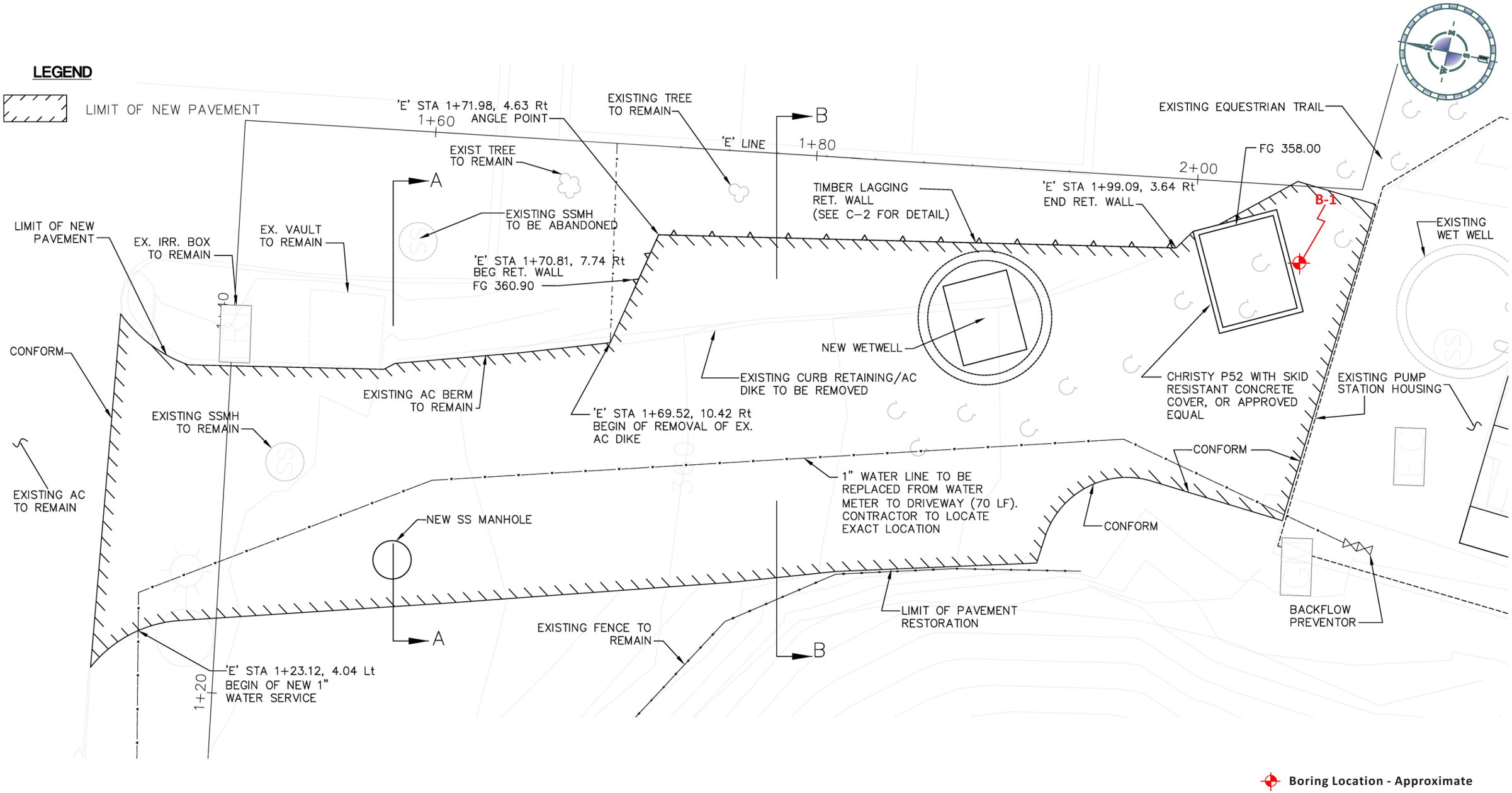


Source: Google Maps

GEOTECHNICAL ENGINEERING INVESTIGATION TOWN CENTER PUMP STATION IMPROVEMENTS 2995 WOODSIDE ROAD WOODSIDE, CALIFORNIA	**VICINITY MAP**		
	DATE: April 2016	JOB NUMBER: WOODS-16-01	PLATE 1

BYGG ENGINEERS



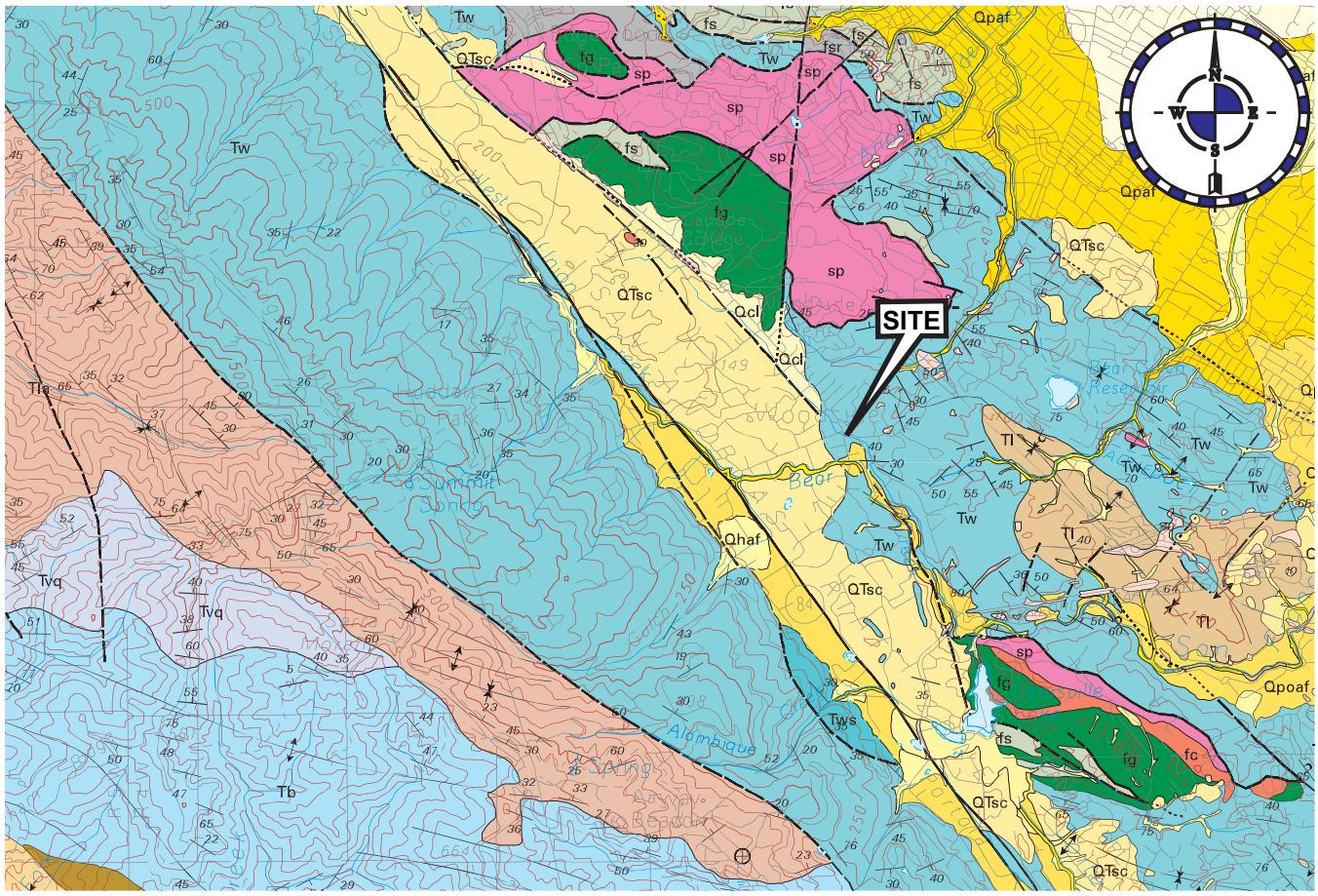
Base: "Site Improvent, Drawing N0. C-1" Town Center Pump Station Improvements, dated 12/17/15, Prepared by Mark Thomas & Company, Inc, Project #Cu-14116

GEOTECHNICAL ENGINEERING INVESTIGATION
TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

BAGG ENGINEERS

BORING PLAN

JOB NUMBER:	SCALE:	DATE:	PLATE
WOODS-16-01	1" = 5'	April 2016	2



LEGEND

Qcl **Colluvium** (Holocene) – Loose to firm, friable, unsorted sand, silt, clay, gravel, rock debris, and organic material in varying proportions.

Qpoaf **Older Alluvial Fan Deposits** (Pleistocene) – Brown dense gravely and clayey sand or clayey gravel that fines upward to sandy clay. These deposits display various sorting qualities. All Qpoaf deposits can be related to modern stream coarses. They are distinguished from younder alluvial fans and fluvial deposits by higher topographic position, greater degree of dissection, and stronger profile development. They are less permeable than younger deposits, and locally contain fresh-water mollusks and extinct Pleistocene vertebrate fossils.

Qof **Coarse-grained Older Alluvial Fan and Stream Terrace Deposits** (Pleistocene) – Poorly consolidated gravel, sand, and silt, coarser grained at heads of old fans and in narrow canyons

QTsc **Santa Clara Formation** (lower Pleistocene and upper Pliocene) – Gray to red-brown poorly indurated conglomerate, sandstone, and mudstone in irregular and lenticular beds. Conglomerate consists mainly of subangular to subrounded cobbles in a sandy matrix but locally includes pebbles and boulders. Cobbles and pebbles are mainly chert, greenstone, and graywacke with some schist, serpentinite, and limestone.

Tl **Ladera Sandstone** (upper (?) and middle Miocene) – Medium-to light-gray to yellowish-gray and buff, fine-grained, poorly cemented sandstone and siltstone, with minor amounts of coarse-grained sandstone, yellow-brown dolomitic claystone, and white to light-gray porcelaneous shale and porcelanite. Fine-grained sandstone and siltstone comprise more than 90 percent of formation.

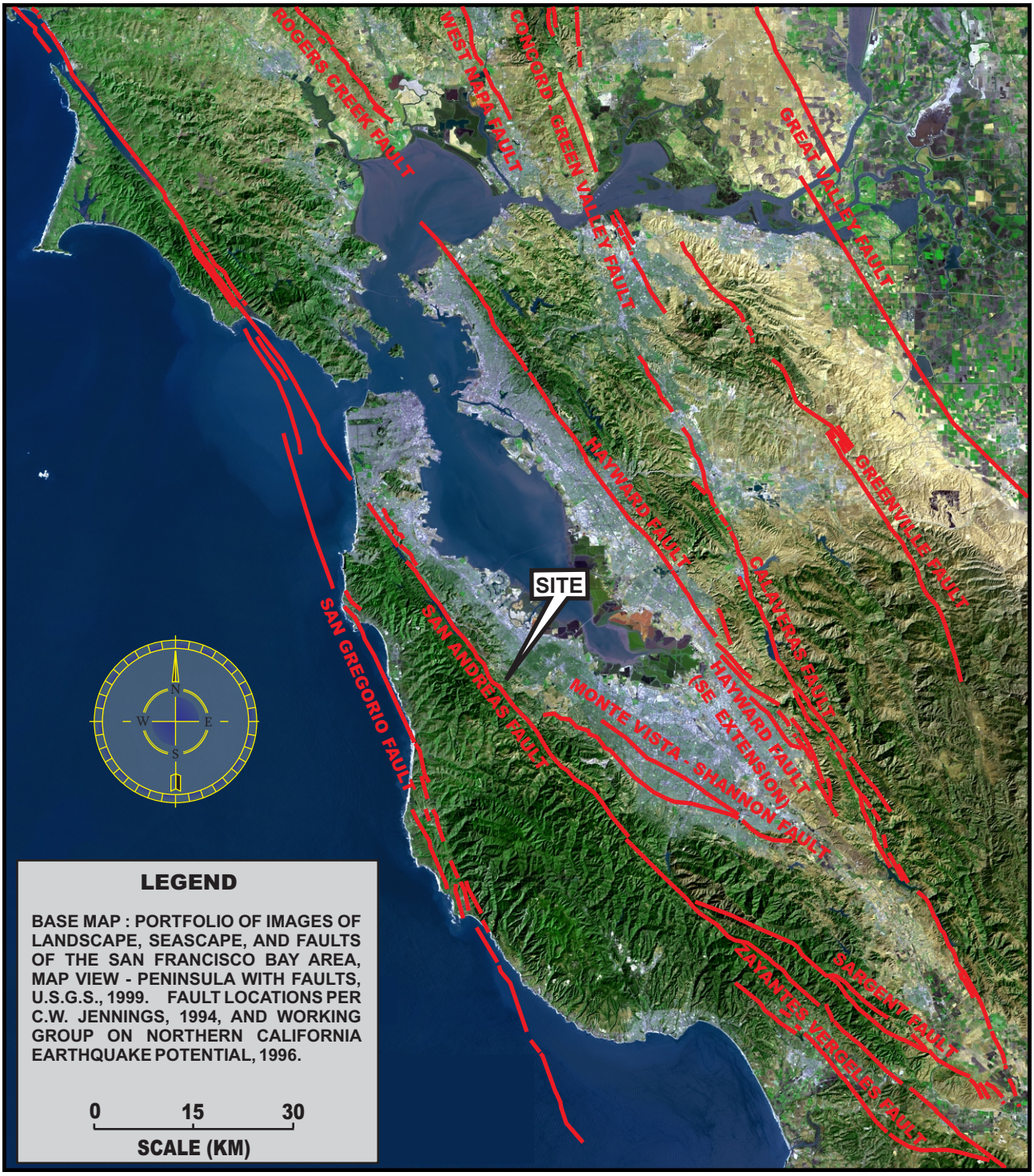
Tw **Whiskey Hill Formation** (middle and lower Eocene) – Light-gray to buff coarse-grained arkosic sandstone, with light-gray to buff silty claystone, glauconitic sandstone, and tuffaceous siltstone. Sandstone beds constitute about 30 percent of map unit. Tuffaceous and silty claystone beds are expansive. In places within this map unit, sandstone and claystone beds are chaotically disturbed. This formation is as much as 900 m thick.

sp **Serpentinite** (Cretaceous and/or Jurassic) – Greenish-gray to bluish-green sheared serpentinite, enclosing variably abundant blocks of unsheared rock.

Reference: *Geology of the Onshore Part of San Mateo County, California*: Derived From the Digital Database Open-File 98-137, by E.E. Brabb, R.W. Graymer, and D.L. Jones, 1998.

GEOTECHNICAL ENGINEERING INVESTIGATION TOWN CENTER PUMP STATION IMPROVEMENTS 2995 WOODSIDE ROAD WOODSIDE, CALIFORNIA	REGIONAL GEOLOGY MAP		
	DATE: April 2016	JOB NUMBER: WOODS-16-01	PLATE 3

BVGG ENGINEERS



GEOTECHNICAL ENGINEERING INVESTIGATION
TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

REGIONAL FAULT MAP

DATE:	JOB NUMBER:	PLATE
April 2016	WOODS-16-01	4

BVGG ENGINEERS

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
GW	Well graded gravel Well graded gravel with sand	**GRAVELS** More than half of coarse fraction is larger than No. 4 sieve size
GP	Poorly graded gravel Poorly graded gravel with sand	
GM	Silty gravel Silty gravel with sand	
GC	Clayey gravel Clayey gravel with sand	
SW	Well graded sand Well graded sand with gravel	**SANDS** More than half of coarse fraction is smaller than No. 4 sieve size
SP	Poorly graded sand Poorly graded sand with gravel	
SM	Silty sand Silty sand with gravel	
SC	Clayey sand Clayey sand with gravel	

NOTE: Coarse-grained soils receive dual symbols if:
(1) their fines are CL-ML (e.g. SC-SM or GC-GM) or
(2) they contain 5-12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS

MORE THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
CL	Lean clay Sandy lean clay with gravel	**SILTS AND CLAYS** liquid limit less than 50
ML	Silt Sandy silt with gravel	
OL	Organic clay Sandy organic clay with gravel	
CH	Fat clay Sandy fat clay with gravel	**SILTS AND CLAYS** liquid limit more than 50
MH	Elastic silt Sandy elastic silt with gravel	
OH	Organic clay Sandy organic clay with gravel	
PT	Peat Highly organic silt	**HIGHLY ORGANIC SOIL**

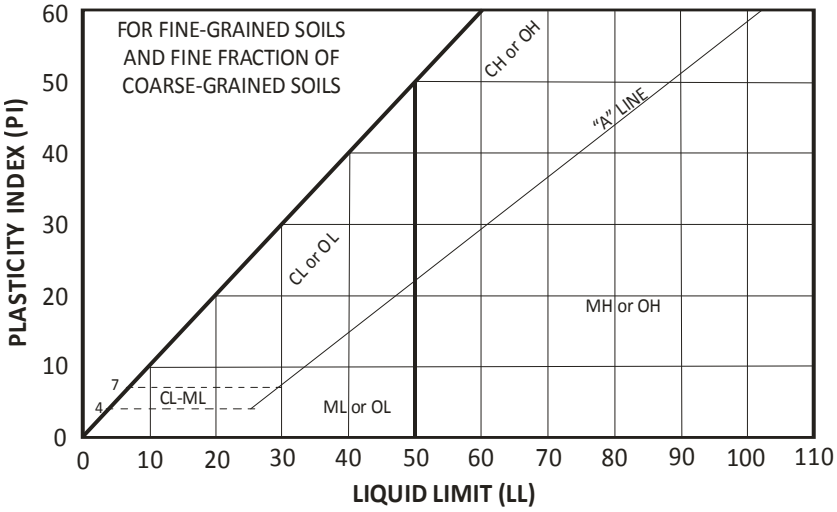
NOTE: Fine-grained soils receive dual symbols if their limits in the hatched zone on the Plasticity Chart(L-M)

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No.4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES:	BELOW No. 200

NOTE: Classification is based on the portion of a sample that passes the 3-inch sieve.

PLASTICITY CHART



Reference: ASTM D 2487-06, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

GENERAL NOTES: The tables list 30 out of a possible 110 Group Names, all of which are assigned to unique proportions of constituent soils. Flow charts in ASTM D 2487-06 aid assignment of the Group Names. Some general rules for fine grained soils are: less than 15% sand or gravel is not mentioned; 15% to 25% sand or gravel is termed "with sand" or "with gravel", and 30% to 49% sand or gravel is termed "sandy" or "gravelly". Some general rules for coarse-grained soils are: uniformly-graded or gap-graded soils are "Poorly" graded (SP or GP); 15% or more sand or gravel is termed "with sand" or "with gravel", 15% to 25% clay and silt is termed clayey and silty and any cobbles or boulders are termed "with cobbles" or "with boulders".

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL TYPES (Ref 1)

Boulders: particles of rock that will not pass a 12-inch screen.
Cobbles: particles of rock that will pass a 12-inch screen, but not a 3-inch sieve.
Gravel: particles of rock that will pass a 3-inch sieve, but not a #4 sieve.
Sand: particles of rock that will pass a #4 sieve, but not a #200 sieve.
Silt: soil that will pass a #200 sieve, that is non-plastic or very slightly plastic, and that exhibits little or no strength when dry.
Clay: soil that will pass a #200 sieve, that can be made to exhibit plasticity (putty-like properties) within a range of water contents, and that exhibits considerable strength when dry.

MOISTURE AND DENSITY

Moisture Condition: an observational term; dry, moist, wet, or saturated.
Moisture Content: the weight of water in a sample divided by the weight of dry soil in the soil sample, expressed as a percentage.
Dry Density: the pounds of dry soil in a cubic foot of soil.

DESCRIPTORS OF CONSISTENCY (Ref 3)

Liquid Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting liquid and plastic characteristics. The consistency feels like soft butter.
Plastic Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting plastic and semi-solid characteristics. The consistency feels like stiff putty.
Plasticity Index: the difference between the liquid limit and the plastic limit, i.e. the range in water contents over which the soil is in a plastic state.

MEASURES OF CONSISTENCY OF COHESIVE SOILS (CLAYS) (Ref's 2 & 3)

Very Soft	N=0-1*	C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000 psf	Dented slightly by a pencil point

*__N__=blows per foot in the Standard Penetration Test. In cohesive soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 1.2 to get N (Ref 4).

MEASURES OF RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND SILTS) (Ref's 2 & 3)

Very Loose	N=0-4**	RD=0-30	Easily push a ½-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a ½-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a ½-inch reinforcing rod
Dense	N=31-50	RD=70-90	Drive a ½-inch reinforcing rod 1 foot
Very Dense	N>50	RD=90-100	Drive a ½-inch reinforcing rod a few inches

**__N__=Blows per foot in the Standard Penetration Test. In granular soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 2 to get N (Ref 4).

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Ref 1: ASTM Designation: D 2487-06, **Standard Classification of Soils for Engineering Purposes** (Unified Soil Classification System).

Ref 2: Terzaghi, Karl, and Peck, Ralph B., **Soil Mechanics in Engineering Practice,** John Wiley & Sons, New York, 2nd Ed., 1967, pp. 30, 341, and 347.

Ref 3: Sowers, George F., **Introductory Soil Mechanics and Foundations: Geotechnical Engineering,** Macmillan Publishing Company, New York, 4th Ed., 1979, pp. 80, 81, and 312.

Ref 4: Lowe, John III, and Zaccheo, Phillip F., **Subsurface Explorations and Sampling,** Chapter 1 in "Foundation Engineering Handbook," Hsai-Yang Fang, Editor, Van Nostrand Reinhold Company, New York, 2nd Ed, 1991, p. 39.

SOIL TERMINOLOGY

WEATHERING DESCRIPTORS

Fresh — No discoloration, not oxidized, no separation, hammer rings when crystalline rocks are struck.

Slight — Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull, no visible separation, hammer rings when crystalline rocks are struck, body of rock not weakened.

Moderate — Discoloration extends from fractures, usually throughout; Fe-Mg materials are "rusty", feldspar crystals are "cloudy", all fractures are discolored or oxidized, partial separation of boundaries visible, texture generally preserved, hammer dose not ring when rock is struck, body of rock is slightly weakened.

Intense — Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation, all fracture surfaces are discolored or oxidized, surfaces friable, partial separation, texture altered by chemical disintegration, dull sound when struck with hammer, rock is significantly weakened.

Decomposed — Discolored or oxidized throughout, but resistant mineral such as quartz may be unaltered, all feldspars and Fe-Mg minerals are completely altered to clay, complete separation of grain boundaries, resembles a soil, partial or complete remnant of rock structure may be preserved, can be granulated by hand, resistant minerals such as quartz may be present as "stringers" or "dykes".

BEDDING FOLIATION AND FRACTURE SPACING DESCRIPTORS

Millimeters	Feet	Bedding	Fracture Spacing
>10	<0.03	Laminated	Very Close
10-30	0.03-0.1	Very Thin	Very Close
30-100	0.1-0.3	Thin	Close
100-300	0.3-1	Moderate	Moderate
300-1000	1-3	Thick	Wide
1000-3000	3-10	Very Thick	Very Wide
>3000	>10	Massive	Extremely Wide

ROCK HARDNESS/STRENGTH DESCRIPTORS*

Extremely Hard — Core, fragment, or exposure cannot be scratched with knife or sharp pick; can only be chipped with repeated heavy hammer blows.

Very Hard — Cannot be scratched with knife or sharp pick. Core or fragment breaks with repeated heavy hammer blows.

Hard — Can be scratched with knife or sharp pick with difficulty (heavy pressure). Heavy hammer blow required to break specimen.

Moderately Hard — Can be scratched with knife or sharp pick with light or moderate pressure. Core or fragment breaks with moderate hammer blow.

Moderately Soft — Can be grooved $^1/_{16}$ inch (2mm) deep by knife or sharp pick with moderate or heavy pressure. Core fragment breaks with light hammer blow or heavy manual pressure.

Soft — Can be grooved or gouged easily by knife or sharp pick with light pressure, can be scratched with fingernail. Breaks wit light to moderate manual pressure.

Very Soft — Can be readily indented, grooved, or gouged with fingernail, or carved with a knife. Breaks with light manual pressure.

*Note: Although "sharp pick" is included in those definitions, descriptions of ability to be scratched, grooved, or gouged by a knife is the preferred criteria.

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"Engineering Geology Field Manual, Second Edition, Volume 1, by U.S. Department of Interior, Bureau of Reclamation, 1998

ROCK TERMINOLOGY

BAGG ENGINEERS

GENERAL NOTES FOR BORING LOGS:

The boring logs are intended for use only in conjunction with the text, and for only the purposes the text outlines for our services. The Plate "Soil Terminology" defines common terms used on the boring logs.

The plate "Unified Soil Classification System," illustrates the method used to classify the soils. The soils were visually classified in the field; the classifications were modified by visual examination of samples in the laboratory, supported, where indicated on the logs, by tests of liquid limit, plasticity index, and/or gradation. In addition to the interpretations for sample classification, there are interpretations of where stratum changes occur between samples, where gradational changes substantively occur, and where minor changes within a stratum are significant enough to log.

There may be variations in subsurface conditions between borings. Soil characteristics change with variations in moisture content, with exchange of ions, with loosening and densifying, and for other reasons. Groundwater levels change with seasons, with pumping, from leaks, and for other reasons. Thus boring logs depict interpretations of subsurface conditions only at the locations indicated, and only on the date(s) noted.

SPECIAL FIELD NOTES FOR THIS REPORT:

1. The borings were drilled on March 11, 2016, with a truck-mounted drilling rig using hollow stem augers. The borings were sealed with cement immediately after the last soil sample was collected.

2. The boring locations were approximately located by using a tape measure and/or pacing from known points on the site, as shown on Plate 2, Site Plan.

3. The soils' Group Names [e.g. SANDY LEAN CLAY] and Group Symbols [e.g. (CL)] were determined or estimated per ASTM D 2487-06, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System, see Plate 5). Other soil engineering terms used on the boring log are defined on Plate 6, Soil Terminology.

4. The "Blow Count" Column on the boring logs indicates the number of blows required to drive the sampler below the bottom of the boring, and the blow counts given are for each 6 inches of sampler penetration. The samples from the boring were driven with a 140-pound hammer.

5. Groundwater was encountered in the boring drilled for this investigation as indicated in the boring logs.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Paving
	Sandy lean clay
	High plasticity (fat) clay
	Moderate plasticity clay
	Silty sand
	Borderline sandy lean clay to clayey sand
	Clayey sand
	Claystone
Misc. Symbols	
	Water first encountered during drilling
	Water level at completion of boring
Soil Samplers	
	Modified California Sampler: 2.375" ID by 3" OD, split-barrel sampler driven w/ 140-pound hammer falling 30 inches
	Standard Penetration Test: 1 3/8" ID by 2" OD, split-spoon sampler driven with 140-pound hammer falling 30" (ASTM D 1586-99)

Symbol	Description
Line Types	
_____	Denotes a sudden, or well identified strata change
- - - - - - -	Denotes a gradual, or poorly identified strata change
Laboratory Data	
%Fines	Percentage of material passing the #200 sieve
%Sand	Percentage of material passing the #4 sieve and retained on the #200 sieve
LL	Liquid Limit
PI	Plasticity Index
Consol.	Consolidation test performed on a sample

BORING LOG

Boring No. B-1

JOB NAME: Town Center Pump Station Improvements
CLIENT: Town of Woodside
LOCATION: 2995 Woodside Road, Woodside, CA
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: 8-inch Diameter Hollow Stem Augers - Truck Mounted

JOB NO.: WOODS-16-01
DATE DRILLED: March 11, 2016
ELEVATION: 358'
LOGGED BY: EW
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			Pavement	3" AC
								CL	SANDY LEAN CLAY: Yellow-brown, very moist, very fine-grained sand	...Hand auger to $3\frac{1}{2}$ feet bgs
						2.5		CH	FAT CLAY: Gray-brown, stiff, moist, trace very fine-grained sand, trace rootlets	
				17.0	112.1		3, 7, 11			
						5				
						7.5		CL/ CH	LEAN CLAY: Mottled blue-gray and yellow- brown, stiff, moist, trace to few very fine-grained sand, medium plasticity fines, trace rootlets	
				20.6	106.4		5, 5, 7			
						10				
								SM	SILTY SAND WITH GRAVEL: Yellow-brown, very moist	
						12.5		CL/ SC	BORDERLINE SANDY LEAN CLAY/CLAYEY SAND: Yellow-brown with orange-brown mottling, stiff/medium dense, moist, few fine-grained sand, some very fine-grained sand, low plasticity fines	
				25.8	98.5		4, 5, 11			%Sand=51.7
				25.6	101.5	15				%Fines=48.3 PI=21 LL=34 Consol.

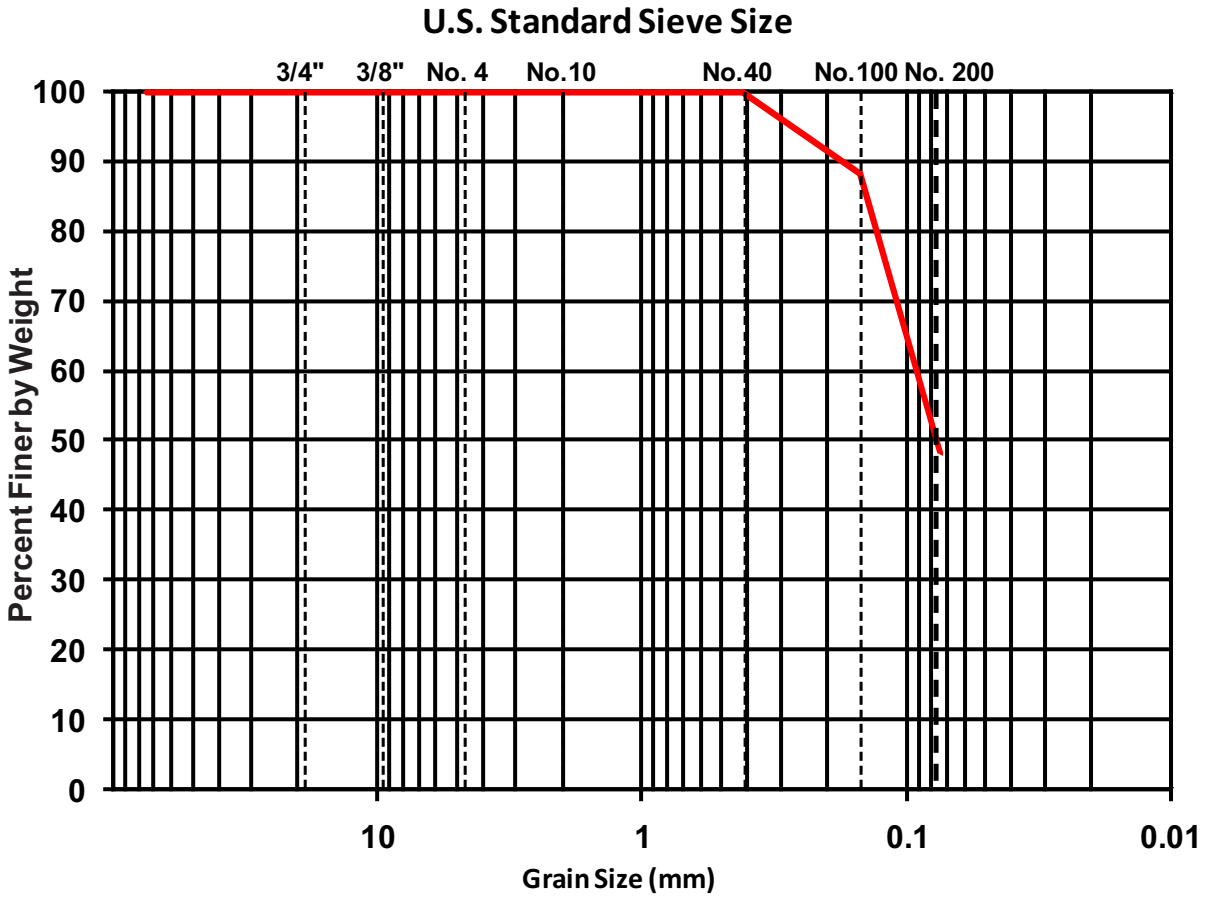
BORING LOG

Boring No. B-1

JOB NAME: Town Center Pump Station Improvements
CLIENT: Town of Woodside
LOCATION: 2995 Woodside Road, Woodside, CA
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: 8-inch Diameter Hollow Stem Augers - Truck Mounted

JOB NO.: WOODS-16-01
DATE DRILLED: March 11, 2016
ELEVATION: 358'
LOGGED BY: EW
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						17.5				
				19.7 12.7			45 50/4"	SM SC	SILTY SAND: Gray to olive-gray, dense, very moist, very fine- to fine-grained sand, few to little medium-grained sand, trace to few subangular to subrounded coarse-grained sand and fine gravel	
						20				
						22.5			CLAYEY SAND WITH GRAVEL: Orange-brown and olive-gray, very dense, very moist, subangular to subrounded fine gravel, trace to few coarse gravel, fine- to medium-grained sand, little coarse-grained sand, slightly clayey	
				17.3			27 50/3½	ROCK	...decrease in gravel content	
						25			WHISKEY HILL FORMATION CLAYSTONE: Dark gray, slightly weathered, extremely to very closely fractured, firm, weak to moderately strong, thickly to massively bedded, contains white to light gray carbonate-rich inclusions	
						27.5	50/3"			...Drilling refusal
						30			The boring was terminated at approximately 28¼ feet bgs. Groundwater was encountered at approximately 11 feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with quick setting concrete.	
						32.5				



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LEGEND	
SAMPLE NUMBER	B-1-3
DEPTH (FEET)	14½
SOIL DESCRIPTION	Clayey Sand/Sandy Lean Clay (SC/CL)

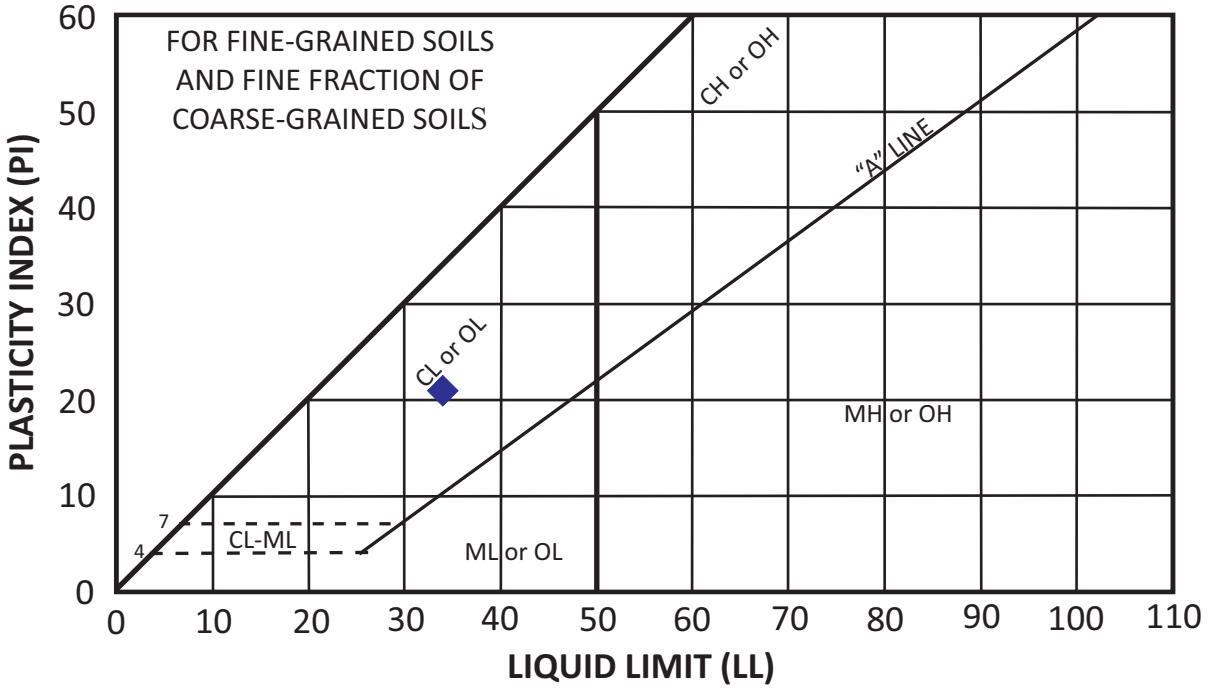
GEOTECHNICAL ENGINEERING INVESTIGATION
TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

GRADATION TEST DATA

DATE:	JOB NUMBER:	PLATE
April 2016	WOODS-16-01	11

BVGG ENGINEERS

PLASTICITY CHART



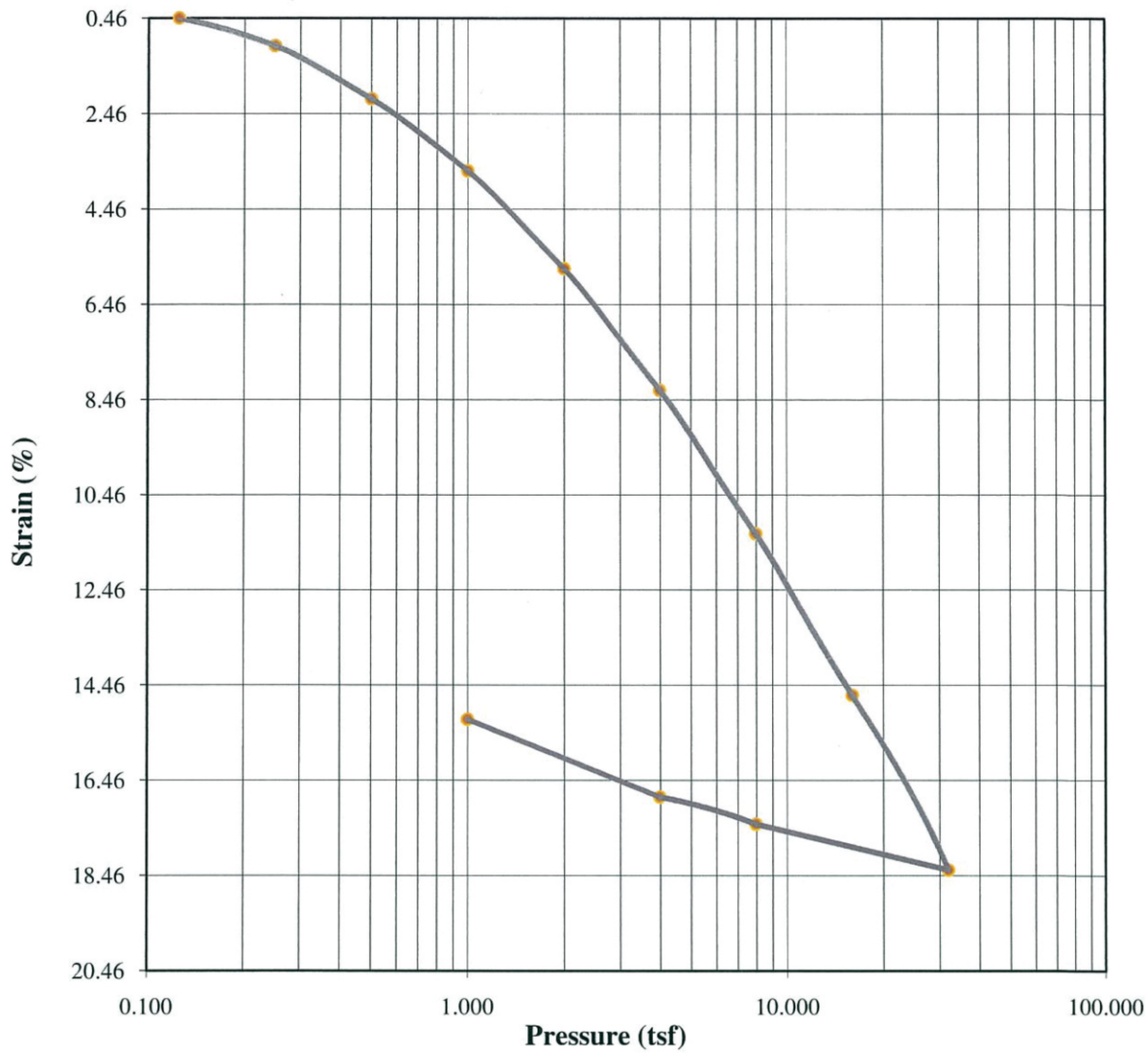
SYMBOL	SAMPLE SOURCE	DEPTH (FEET)	NATURAL WATER CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION
◆	Boring B-1	14.5	25.8	34	13	21	Yellow-Brown Clayey Sand/Sandy Lean CLay

GEOTECHNICAL ENGINEERING INVESTIGATION
TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

PLASTICITY DATA

DATE:	JOB NUMBER:	PLATE
April 2016	WOODS-16-01	12

BAGG ENGINEERS



	Before	After				
			Liquid Limits:	0	Test Date:	3/16/16
Moisture (%):	25.63	17.32	Plastic Limits:	0		
Dry Density (pcf):	101.49	119.84	Plasticity Index (%):	0		
Saturation (%):	107.79	120.65				
Void Ratio:	0.6273	0.3803	Specific Gravity:	2.650	Assumed	

Sample Description: Brown CL

Project Number: WOODS-16-01 **Depth:** 14.5'

Sample Number: 3 **Boring Number:** B-1-3

Project: Twin Center Pump Station

Client:

Location: On Site

Remarks:

GEOTECHNICAL ENGINEERING INVESTIGATION
TOWN CENTER PUMP STATION IMPROVEMENTS
2995 WOODSIDE ROAD
WOODSIDE, CALIFORNIA

CONSOLIDATION TEST DATA

DATE:	JOB NUMBER:	PLATE
April 2016	WOODS-16-01	13

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