

**PROGRESSIVE DESIGN-BUILD
AGREEMENT FOR SERVICES
FOR WQCF ULTRA-VIOLET DISINFECTION SYSTEM REHABILITATION CIP 25004 &
AMMONIA SIDESTREAM TREATMENT CIP 25005 PROJECT**

THIS AGREEMENT ("AGREEMENT") is made and entered into this _____ day of _____, _____, by and between the CITY OF MANTECA, a municipal corporation of the State of California (hereinafter referred to as "CITY"), and

C. OVERAA & CO.

Design-Build Firm

200 PARR BOULEVARD

RICHMOND

CA

94801

MAILING ADDRESS

CITY

STATE

ZIP

a California corporation.

N/A

STATE LICENSE CLASSIFICATION & NUMBER (if required)
hereinafter referred to as "DB Firm".

WITNESSETH:

A. WHEREAS, CITY desires to enter into this AGREEMENT for services for the Progressive Design-Build delivery of the Ultra-Violet (UV) Disinfection System Rehabilitation (CIP 25004) and Ammonia Sidestream Treatment (CIP 25005) Project (collectively "PROJECT").

B. WHEREAS, CITY desires to retain DB Firm to provide these services by reason of its qualifications, applicable license(s), and experience for performing such services, and DB Firm has offered to provide the required services on the terms and in the manner set forth herein.

C. WHEREAS, in March 2022, the CITY completed a capacity assessment study for the Manteca Wastewater Quality Control Facility (WQCF) (the "Site" or "Job Site"), which identified 10 interim improvement projects needed to improve the WQCF treatment process, and among them was the Ammonia Sidestream Treatment; and

D. WHEREAS, in March 2024, the CITY adopted the 2024 Wastewater Master Plan which identified additional interim improvement projects to improve the WQCF treatment process and among them is the Ultra-Violet Disinfection System Rehabilitation; and

E. WHEREAS, on August 6, 2024, the CITY entered into an Agreement ("C2024-120") for Professional Services with Carollo Engineers, Inc. ("Carollo") for the preparation of a predesign report (PDR) as a basis of design for the Ultra-Violet (UV) Disinfection System Rehabilitation (CIP 25004) and Ammonia Sidestream Treatment (CIP 25005) Project to ensure continued permit and regulatory compliance; and

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- F. WHEREAS, the completed PDR recommended the following:
- Sidestream treatment facilities for treatment of centrate by the Anita Mox De-Ammonification process
 - New UV disinfection structure with Trojan UVSigna 2-Row system
 - New electrical building for UV system
 - Yard piping, paving and grading, and other site civil improvements as needed; and

G. WHEREAS, staff explored a variety of alternative delivery methods beyond the standard Design-Bid-Build to try and accelerate the project delivery schedule to continue to meet current treatment requirements, staff concluded that the Progressive Design-Build (PDB) delivery method allows for the best balance for control of scope, fee, and schedule; and

H. WHEREAS, Chapter 4.7 Section 22185 of the Public Contract Code allows local agencies to utilize design-build contracting for up to 10 public works projects in excess of \$5,000,000 for each project; and

I. WHEREAS, the Progressive Design-Build delivery method will allow these critical plant capacity projects to be completed most expeditiously and allow for the ordering of long lead items and starting phases of construction as early as Summer 2026; and

J. WHEREAS, on April 15, 2025, the Manteca CITY Council adopted a resolution approving Amendment No. 1 to the Agreement ("C2024-120-A1") for Professional Services with Carollo to serve as the CITY'S Agent in moving forward with delivering the projects via a PDB method; and

K. WHEREAS, DB Firm acknowledges the CITY'S interest in expediting the PROJECT, including its objective of achieving functional testing by the end of 2027; however, such objective is not a contractual milestone, and shall have no effect on the Contract Time or any other binding requirement under the Contract Documents; and

L. WHEREAS, CITY determined that its goals for the Project would be best-served by using a process whereby CITY and DB Firm will collaboratively implement the Project through Progressive Design-Build project delivery method, during which DB Firm will deliver the Project in two phases; and

M. WHEREAS, in phase 1 ("Pre-Construction Phase"), the DB Firm shall prepare approximately 75% Plans Specifications and Estimates ("PS&E") in sufficient detail to obtain subcontractor bids via a competitive bidding process to ultimately negotiate a Guaranteed Maximum Price ("GMP") for the phase 2 ("Construction Phase") with the CITY; and

N. WHEREAS, if CITY and DB Firm cannot agree to a GMP, the DB Firm shall prepare a PS&E bid set for a Design-Bid-Build Project delivery; and

NOW, THEREFORE, in consideration of their mutual covenants, the parties hereto agree as follows:

AGREEMENT**1. SCOPE OF SERVICES:**

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A. DB Firm shall do all work, attend all meetings, produce all reports and carry out all activities necessary to complete the services for the PROJECT attached here to as **EXHIBIT "A"** and incorporated by reference as if fully set forth herein. This AGREEMENT and its exhibits shall be known as the "AGREEMENT DOCUMENTS". Terms set forth in any AGREEMENT DOCUMENT shall be deemed to be incorporated in all AGREEMENT DOCUMENTS as if set forth in full herein. In the event of conflict between terms contained in these AGREEMENT DOCUMENTS, the more specific term shall govern. If any portion of the AGREEMENT DOCUMENTS is in conflict with any other portion or provisions contained in the AGREEMENT, the AGREEMENT shall govern over the conflicting provisions contained in the exhibits to the AGREEMENT. To eliminate doubt, in the case of conflict between DB Firm's proposal or DB Firm's attachments and the CITY'S AGREEMENT and attachments, the CITY'S AGREEMENT and attachments shall take precedence over DB Firm's proposal and attachments.

B. DB Firm enters into this AGREEMENT as an independent contractor and not as an employee of the CITY. The DB Firm shall have no power or authority by this AGREEMENT to bind the CITY in any respect. Nothing in this AGREEMENT shall be construed to be inconsistent with this relationship or status. All employees, agents, contractors or subcontractors hired or retained by the DB Firm are employees, agents, contractors or subcontractors of the DB Firm and not of the CITY. The CITY shall not be obligated in any way to pay any wage claims or other claims made against DB Firm by any such employees, agents, contractors or subcontractors, or any other person resulting from performance of this AGREEMENT.

C. The DB Firm agrees it has satisfied itself by its own investigation and research regarding the conditions affecting the work to be done, labor and materials needed, and that its decision to execute this AGREEMENT is based on such independent investigation and research.

D. **Pre-Construction Phase:**

DB Firm shall perform the services of design, pricing, and other services for the PROJECT based on the Pre-Construction Phase Scope of Services as set forth in **EXHIBIT "A"**, attached hereto and incorporated herein (the "Pre-Construction Phase Scope of Services"). DB Firm shall perform such services to the level of completion required for DB Firm and CITY to establish the GMP for the Construction Phase, as set forth below. The Pre-Construction Phase Services shall commence within ten (10) working days of DB Firm's receipt of CITY'S Notice to Proceed unless the parties mutually agree otherwise in writing. DB Firm shall schedule workshops with the CITY at completion of 50% and 75% design, corresponding decision logs, and release of purchase for long lead items.

Upon completion of the Pre-Construction Phase Services, the DB Firm shall submit a proposal to CITY for the completion of the Construction Phase of the PROJECT. Construction Phase services shall consist of the completion of design services for the Project, the procurement of all materials and equipment for the PROJECT, the performance of construction services for the PROJECT, and the start-up, testing, and commissioning of the PROJECT. The DB Firm's Construction Phase Services and Pre-Construction Phase Services shall collectively be referred to herein as the "WORK". The GMP shall be developed during the Pre-Construction Phase on an open-book bid basis. All cost estimates for GMP development shall be disclosed to the CITY during the Pre-Construction Phase for negotiation.

The GMP Proposal shall include the following unless the parties mutually agree otherwise:

- The cost for development of PS&E bid-set.

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- The proposed GMP.
- A list of the assumptions and clarifications made by DB Firm in the preparation of the Proposal, which list is intended to supplement the information contained in the drawings and specifications.
- All mark-ups including but not limited to all overhead, profit, labor, materials, equipment, supplies, all taxes sales, consumer, use, employment-related and other taxes mandated by applicable Laws and Regulations or that result from the performance of the WORK.
- The Scheduled Substantial Completion Date upon which the GMP is based, and a schedule upon which the Substantial Completion Date is based and a Project Schedule for the WORK.
- If applicable, a list of Allowance Items, Allowance Values, and a statement of their basis.
- If applicable, a schedule of alternate prices.
- If applicable, a schedule of unit prices.
- If applicable, a statement of Additional Services which may be performed but which are not included in the proposed GMP, and which, if performed, shall be the basis for a change in compensation and/or schedule.
- The time limit for acceptance of the proposed GMP, which shall not be less than one hundred twenty (120) days from the date of delivery of the proposed GMP.

E. A permit list detailing any permits and/or regulatory approvals and the party responsible for acquiring such permit, if any. The DB Firm will be responsible for the application, acquisition, and maintenance of various governmental approvals required for this WORK. The CITY will provide reasonable assistance in connection with such obligation.

After submission of the GMP Proposal, DB Firm and CITY shall meet to discuss and review the proposal. CITY, shall give written notice to DB Firm of any comments, inconsistencies, or inaccuracies in the information presented. If appropriate, DB Firm shall, upon receipt of CITY'S notice, make appropriate adjustments to the GMP.

Upon mutual written AGREEMENT, the GMP Proposal shall establish the basis for an amendment to this AGREEMENT, for the Construction Phase. Under no circumstances shall the DB Firm proceed with any Construction Phase WORK unless the GMP Proposal has been accepted in writing by the CITY.

If CITY rejects the GMP Proposal, or fails to notify DB Firm in writing on or before the date specified, the proposal shall be deemed withdrawn. In such event, either party may terminate this AGREEMENT subject to section 4.

F. **Construction Phase:**

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DB Firm shall commence with the Construction Phase upon receipt of the Notice to Proceed and will perform the WORK in accordance with the GENERAL CONDITIONS (**EXHIBIT "D"**) and AGREEMENT DOCUMENTS.

DB Firm shall substantially complete the WORK no later than the date set forth in the GMP Proposal ("Scheduled Substantial Completion Date"), subject to adjustment in accordance with the GENERAL CONDITIONS (**EXHIBIT "D"**).

DB Firm shall achieve Final Completion no later than ninety (90) days from Substantial Completion ("Scheduled Final Completion Date"), subject to adjustment in accordance with the GENERAL CONDITIONS (**EXHIBIT "D"**).

It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that CITY will sustain in the event of and by reason of DB Firm's delay; therefore, DB Firm agrees that it shall pay to CITY the sum of TEN THOUSAND DOLLARS (\$10,000) per day as liquidated damages for the period of time that any portion of the WORK remains unfinished after the time fixed for an interim milestone and/or Substantial Completion.

It is hereby understood and agreed that this amount is not a penalty, but is a reasonable estimate of the damages that CITY will incur. In the event any portion of the liquidated damages is not paid to CITY, CITY may deduct that amount from any money due or that may become due the DB Firm under this AGREEMENT, CITY may seek recovery of Liquidated Damages from the DB Firm's Performance Bond Surety and/or CITY may seek recovery of Liquidated Damages from the DB Firm or the Performance Bond Surety without having exhausted remedies against the other.

2. TERM OF AGREEMENT

A. The services of DB Firm are to commence upon execution of this AGREEMENT and shall be completed and this AGREEMENT terminated on December 31, 2029, unless otherwise extended in writing by the mutual AGREEMENT of both parties.

B. The CITY Manager, or their designee may, by written instrument signed by the Parties, extend the duration of this AGREEMENT in the manner provided in Section 5, provided that the extension does not require the payment of compensation in excess of the maximum compensation set forth in Section 3, Compensation.

3. COMPENSATION:

A. The DB Firm shall be paid in accordance with the attached Fee Schedule in **EXHIBIT "B"**. DB Firm charges separately for certain costs incurred in the representation, as well as for any disbursements to third parties made on CITY'S behalf. Such costs and disbursements include, for example, the following: mileage (at the IRS rate in effect at the time the travel occurs), overnight delivery and messenger services. DB Firm shall be reimbursed for expenses related to travel, for example (flights, hotels, meals). However, DB Firm shall not make travel arrangements or incur costs on behalf of CITY without prior written authorization to incur said expenses and in no event shall total compensation under this AGREEMENT exceed **TWO MILLION THREE HUNDRED NINETY-SEVEN THOUSAND SEVEN HUNDRED THIRTY**

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DOLLARS AND ZERO CENTS (\$2,397,730.00) without CITY'S prior written approval. An additional TWENTY MILLION DOLLARS (\$20,000,000) may be authorized at a later date with City written authorization.

B. Said amount shall be paid upon submittal of monthly billings showing completion of the tasks that month. DB Firm shall furnish CITY with invoices for all expenses as well as for all materials authorized by this AGREEMENT. The invoices shall be submitted with the monthly billings.

C. If the WORK is temporarily suspended at the request of the CITY, compensation shall be based upon the portion of WORK completed as of the date of the suspension, subject to Section 4.

D. Compensation for Construction Phase Services.

CITY shall pay DB Firm, in accordance with the GENERAL CONDITIONS (**EXHIBIT "D"**), a GMP for the WORK. The GMP shall be established by the GMP Proposal and is subject to adjustments made in accordance with Article 10, 11, and 12 of the GENERAL CONDITIONS (**EXHIBIT "D"**).

For WORK performed after the Effective Date of the Construction Phase, CITY shall make progress payments after CITY'S receipt of each properly submitted and accurate Application for Payment submitted in accordance with Section 14.02 of the GENERAL CONDITIONS (**EXHIBIT "D"**). All such payments will be measured by the Progress Payment Schedule, pursuant to Paragraph 14.01 of the GENERAL CONDITIONS (**EXHIBIT "D"**), and shall reflect the total of payments previously made and amounts properly withheld as retainage, as set forth below, and under the Article 14 of the GENERAL CONDITIONS (**EXHIBIT "D"**). WORK completed as estimated shall be an estimate only and no inaccuracy or error in said estimate shall release DB Firm or any Surety from such WORK or from enforcing each and every provision of the AGREEMENT DOCUMENTS.

Progress payments will be in an amount equal to ninety five percent (95%) of WORK completed. The remaining five percent (5%) of such amounts shall be held as the Retention.

Each Progress Payment shall be conditioned upon DB Firm providing to CITY with the corresponding Application for Payment a conditional waiver and release of claims for payment upon payment from the DB Firm and each of its subcontractors and materials suppliers that have contracts with DB Firm that exceed \$250,000 in the form required by Civil Code Section 8132, covering all sums requested in such Application for Payment, and an unconditional waiver and release of claims for payment from each party, in the form required by Civil Code Section 8132, covering sums disbursed pursuant to the most recently preceding Application for Payment. Failure to provide either a condition waiver and release, or unconditional waiver and release shall result in the subject sums being in dispute, and thus withheld from payment.

After DB Firm has, as reasonably determined by CITY, satisfactorily completed all documented punch list items identified during the final inspection and has delivered, in accordance with the AGREEMENT DOCUMENTS, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked up record documents, and other documents required by the AGREEMENT DOCUMENTS, DB Firm may make application for final payment following the procedure for

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progress payments and in accordance with Section 14.07 of the GENERAL CONDITIONS (**EXHIBIT "D"**).

It is the policy of the CITY that payment for all goods and services shall be made in a timely manner. The time at which payment shall be due from CITY shall be thirty (30) days from receipt of a proper invoice (i.e., Application for Payment) and acceptance of services.

4. TERMINATION:

A. This AGREEMENT may be terminated by either party, provided that the other party is given not less than thirty (30) calendar days' written notice of intent to terminate.

B. The CITY may temporarily suspend this AGREEMENT, at no additional cost to CITY, provided that the DB Firm is given written notice of temporary suspension. If CITY gives such notice of temporary suspension, DB Firm shall immediately suspend its activities under this AGREEMENT.

C. Notwithstanding any provisions of this AGREEMENT, DB Firm shall not be relieved of liability to the CITY for damages sustained by the CITY by virtue of any breach of this AGREEMENT by DB Firm, and the CITY may withhold any payments due to DB Firm until such time as the exact amount of damages, if any, due the CITY from DB Firm is determined.

D. In the event of termination, the DB Firm shall be compensated as provided for in this AGREEMENT, except as provided in Section 4C. Upon termination, the CITY shall be entitled to all final WORK and draft WORK, including but not limited to, appraisals, inventories, studies, analyses, drawings and data estimates performed to that date in accordance with Section 7 herein.

5. AMENDMENTS, CHANGES OR MODIFICATIONS:

Amendments, changes or modifications in the terms of this AGREEMENT may be made at any time by mutual written AGREEMENT between the parties hereto and shall be signed by the persons authorized to bind the parties hereto.

The AGREEMENT DOCUMENTS may only be amended, modified, or supplemented as provided in Article 10, 11, and 12 of the GENERAL CONDITIONS (**EXHIBIT "D"**).

6. EXTENSIONS OF TIME:

DB Firm may, for good cause, request extensions of time to perform the services required herein. Such extensions shall be authorized in advance by the CITY in writing and shall be incorporated in written amendments to this AGREEMENT in the manner provided in Section 5.

7. PROPERTY OF CITY:

A. It is mutually agreed that all draft and final materials prepared by the DB Firm under this AGREEMENT shall become the property of the CITY, and the DB Firm shall have no property right therein whatsoever. Immediately upon termination, the CITY shall be entitled to, and the DB Firm shall deliver to the CITY, all data, drawings, specifications, reports, estimates, summaries and other such materials as may have been prepared or accumulated to date by the DB Firm in

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performing this AGREEMENT which is not DB Firm's privileged information, as defined by law, or DB Firm's personnel information, along with all other property belonging exclusively to the CITY which is in the DB Firm's possession.

B. Additionally, it is agreed that the parties intend this to be an AGREEMENT for WORK, as defined herein, each considers the services, products, and results of the WORK rendered by DB Firm herein to be a WORK made for hire. DB Firm acknowledges and agrees that the WORK (and all rights therein, including, without limitation, copyright) belongs to and shall be the sole and exclusive property of the CITY.

8. COMPLIANCE WITH ALL LAWS:

C. DB Firm shall comply with all applicable laws, ordinances, and codes of federal, state and local governments, and shall commit no trespass on any public or private property in performing any of the WORK authorized by this AGREEMENT. It shall be CITY'S responsibility to obtain all rights of way and easements to enable DB Firm to perform its services herein. DB Firm shall assist CITY in providing the same.

D. DB Firm warrants to the CITY that it is licensed by all applicable governmental bodies to perform this AGREEMENT and will remain so licensed throughout the progress of the WORK, and that it has, and will have, throughout the progress of the WORK, the necessary experience, skill and financial resources to enable it to perform this AGREEMENT.

9. WARRANTIES AND RESPONSIBILITIES - DB FIRM:

A. DB Firm agrees and represents that it is qualified to properly provide the services set forth in **EXHIBIT "A"** in a manner which is consistent with the generally accepted standards of DB Firm's profession.

B. DB Firm agrees and represents that the WORK performed under this AGREEMENT shall be in accordance with applicable federal, State and local law in accordance with Section 17A hereof.

C. DB Firm shall designate a project manager who at all times shall represent the DB Firm before the CITY on all matters relating to this AGREEMENT. The project manager shall continue in such capacity unless and until he or she is removed at the request of the CITY, is no longer employed by DB Firm, or is replaced with the written approval of the CITY, which approval shall not be unreasonably withheld.

D. DB Firm shall provide corrective services without charge to the CITY for services which fail to meet the above professional and legal standards and which are reported to DB Firm in writing within sixty (60) days of discovery. Should DB Firm fail or refuse to perform promptly its obligations, the CITY may render or undertake performance thereof and the DB Firm shall be liable for any expenses thereby incurred.

10. SUBCONTRACTING:

None of the services covered by this AGREEMENT shall be subcontracted without the prior written consent of the CITY, which will not be unreasonably withheld. DB Firm shall be fully responsible to the CITY for the negligent acts and omissions of its contractors and subcontractors, and of persons either directly or indirectly employed by them, as it is for the negligent acts and

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omissions of persons directly employed by DB Firm.

11. ASSIGNABILITY:

DB Firm shall not assign or transfer any interest in this AGREEMENT whether by assignment or novation, without the prior written consent of the CITY. However, claims for money due or to become due to DB Firm from the CITY under this AGREEMENT may be assigned to a financial institution, or to a trustee in bankruptcy, without such approval. Notice of any assignment or transfer whether voluntary or involuntary shall be furnished promptly to the CITY.

12. INTEREST IN AGREEMENT:

DB Firm covenants that neither it, nor any of its employees, agents, contractors, subcontractors has any interest, nor shall they acquire any interest, direct or indirect, in the subject of the AGREEMENT, nor any other interest which would conflict in any manner or degree with the performance of its services hereunder. DB Firm shall make all disclosures required by the CITY'S conflict of interest code in accordance with the category designated by the CITY, unless the CITY Manager determines in writing that DB Firm's duties are more limited in scope than is warranted by the category designated by the CITY code and that a narrower disclosure category should apply. DB Firm also agrees to make disclosure in compliance with the CITY conflict of interest code if, at any time after the execution of this AGREEMENT, CITY determines and notifies DB Firm in writing that DB Firm's duties under this AGREEMENT warrant greater disclosure by DB Firm than was originally contemplated. DB Firm shall make disclosures in the time, place and manner set forth in the conflict of interest code and as directed by the CITY.

13. MATERIALS CONFIDENTIAL:

All of the materials prepared or assembled by DB Firm pursuant to performance of this AGREEMENT are confidential and DB Firm agrees that they shall not be made available to any individual or organization without the prior written approval of the CITY, except by court order.

14. LIABILITY OF DB FIRM-NEGLIGENCE:

DB Firm shall be responsible for performing the WORK under this AGREEMENT in a manner which is consistent with the generally-accepted standards of the DB Firm's profession and shall be liable for its own negligence and the negligent acts of its employees, agents, contractors and subcontractors. The CITY shall have no right of control over the manner in which the WORK is to be done but only as to its outcome, and shall not be charged with the responsibility of preventing risk to DB Firm or its employees, agents, contractors or subcontractors.

15. INDEMNITY AND LITIGATION COSTS:

To the fullest extent permitted by law, DB Firm shall indemnify, defend, and hold harmless the CITY, its officers, officials, agents, and employees against all claims, damages, demands, liability, costs, losses and expenses, including without limitation court costs and reasonable attorneys' fees, arising from DB Firm's negligent acts or negligent failure to act, errors, omissions or willful misconduct incident to the performance of this AGREEMENT except such loss or damage caused solely by the active negligence, sole negligence, or willful misconduct of the CITY. The provisions of this paragraph shall survive termination or suspension of this AGREEMENT.

16. DB FIRM TO PROVIDE INSURANCE:

A. DB Firm shall not commence any WORK before obtaining, and shall maintain in full force at all times during the duration and performance of this AGREEMENT, the policies of insurance specified in this Section. Such insurance must have the approval of the CITY as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than "A" in Class VII (an NR rating is acceptable for Worker's Compensation insurance written with the State Compensation Insurance Fund of California).

B. Prior to execution of this AGREEMENT and prior to commencement of any WORK, the DB Firm shall furnish the CITY with certificates of insurance and copies of endorsements providing evidence of coverage for all policies required by the AGREEMENT. The DB Firm and its contractors and subcontractors shall, at their expense, maintain in effect at all times during the performance of WORK under the AGREEMENT not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the CITY. The maintenance by DB Firm and its contractors and subcontractors of the following coverage and limits of insurance is a material element of this AGREEMENT. The failure of DB Firm or of any of its contractors or subcontractors to maintain or renew coverage or to provide evidence of renewal may be treated by the CITY as a material breach of this AGREEMENT. Approval of the insurance by the CITY shall not relieve or decrease any liability of DB Firm.

1. Commercial General Liability Insurance.

a. DB Firm shall maintain commercial general liability insurance with coverage at least as broad as Insurance Services Office form CG 00 01 (or equivalent), in an amount not less than two million dollars (\$2,000,000) per occurrence and four million dollars (\$4,000,000) minimum limit for the Preconstruction Phase and twenty million dollars (\$20,000,000) per occurrence and forty million dollars (\$40,000,000) minimum limit for the Construction Phase for general aggregate for bodily injury, personal injury, and property damage, including without limitation, blanket contractual liability. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit. DB Firm's general liability policies shall be primary and shall not seek contribution from the CITY'S coverage, and be endorsed using Insurance Services Office form CG 20 10 (or equivalent) to provide that CITY and its officers, officials, employees, and agents shall be additional insureds under such policies. For construction projects, an endorsement providing completed operations coverage for the additional insured, ISO form CG 20 37 (or equivalent), is also required.

b. Any failure to comply with reporting provisions of the policies by DB Firm shall not affect coverage provided the CITY.

c. Coverage shall state that DB Firm insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

d. Coverage shall contain a waiver of subrogation in favor of the CITY.

2. *Automobile Liability.* If vehicles are brought onto CITY facilities, DB Firm shall maintain automobile liability with limits no less than one million dollars (\$1,000,000) minimum limit per accident for bodily injury and property damage.

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3. *Workers' Compensation and Employers' Liability.* DB Firm shall maintain Workers' Compensation Insurance and Employer's Liability Insurance with limits of at least one million dollars (\$1,000,000). DB Firm shall submit to CITY, along with the certificate of insurance, a waiver of subrogation endorsement in favor of CITY, its officers, agents, employees, and volunteers. DB Firm shall sign the Certificate of Compliance with Labor Code 3700 (**EXHIBIT "C"**).

4. *Professional Liability.* DB Firm shall maintain professional liability insurance that insures against professional errors and omissions that may be made in performing the Services to be rendered in connection with this AGREEMENT, in the minimum amount of five million dollars (\$5,000,000) per claim and in the aggregate. Any policy inception date, continuity date, or retroactive date must be before the effective date of this AGREEMENT, and DB Firm agrees to maintain continuous coverage through a period no less than three years after completion of the services required by this AGREEMENT.

5. All Coverages.

a. Each insurance policy required by this AGREEMENT shall be endorsed to state that coverage shall not be suspended, voided, cancelled, or reduced in limits except after thirty (30) days' prior written notice has been given to the CITY.

b. All self-insurance, self-insured retentions, and deductibles must be declared and approved by the CITY.

c. Evidence of Insurance - Prior to commencement of WORK, the DB Firm shall furnish to the CITY certificates, additional insured endorsements, and waivers of subrogation evidencing compliance with the insurance requirements above. The DB Firm must agree to provide complete, certified copies of all required insurance policies when requested by the CITY.

d. Acceptability of Insurers - Insurance shall be placed with insurers admitted in the State of California and with an A.M. Best rating of "A" Class VII or higher.

e. Subcontractors and DB Firms - A category of risk and the applicable insurance requirements will be determined on a "per subcontractor" or "per DB Firm" basis, considering the particular WORK to be done by the subcontractor or DB Firm and the interrelationship of that WORK to other WORK being conducted by the DB Firm.

6. No other provision of this AGREEMENT or any attachment thereto shall reduce the insurance or indemnity obligations imposed under this Section.

C. In addition to any other remedy the CITY may have, if DB Firm fails to maintain the insurance coverage as required in this Section, the CITY may obtain such insurance coverage that is not being maintained, in the form and amount substantially the same as is required herein, and the CITY may deduct the cost of such insurance from any amounts due or which may become due to DB Firm under this AGREEMENT.

D. No policy required by this AGREEMENT shall be suspended, cancelled, terminated by either party, or reduced in coverage or in limits unless written approval is obtained by DB Firm from the CITY.

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E. Any deductibles or self-insured retentions in excess of \$10,000 must be declared to, and approved by, the CITY.

F. The requirement as to types, limits, and the CITY'S approval of insurance coverage to be maintained by DB Firm are not intended to, and shall not in any manner, limit or qualify the liabilities and obligations assumed by DB Firm under the AGREEMENT.

17. MISCELLANEOUS PROVISIONS:

A. Compliance with Laws. DB Firm shall keep itself fully informed of, shall observe and comply with, and shall cause any and all persons, firms or corporations employed by it or under its control to observe and comply with, applicable federal, state, county and municipal laws, ordinances, regulations, orders and decrees which in any manner affect those engaged or employed on the WORK described by this AGREEMENT or the materials used or which in any way affect the conduct of the WORK.

B. Unlawful Acts. DB Firm shall not engage in unlawful employment discrimination. Such unlawful employment discrimination includes, but is not limited to, employment discrimination based upon a person's race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, gender, citizenship, or sexual orientation.

C. Record Retention. DB Firm shall maintain and make available for inspection by the CITY and its auditors accurate records of all of its costs, disbursements and receipts with respect to any WORK under this AGREEMENT. Such inspections may be made during regular office hours at any time until six (6) months after the final payments under this AGREEMENT are made to the DB Firm.

D. Notice. All notices that are required to be given by one party to the other under this AGREEMENT shall be in writing and shall be deemed to have been given if delivered personally or enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail addressed to the parties at the following addresses:

CITY:

Somporn Boonsalat
Deputy Director of Engineering
City of Manteca
1001 W. Center St.
Manteca, CA 95337

DB Firm:

Nick Kebbas
Vice President, Water Group
C. Overaa & Co.
200 Parr Boulevard
Richmond, CA 94801
510-234-0926
nickk@overaa.com

E. Governing Law and Venue. This AGREEMENT shall be interpreted and governed by the laws of the State of California, and any legal action relating to this AGREEMENT shall take place in the Superior Court, County of San Joaquin or the Eastern District of California for any federal litigation.

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F. Waiver. Waiver of any breach or default under this AGREEMENT shall not constitute a continuing waiver of a subsequent breach or default of the same or any other provision under this AGREEMENT.

G. Severability. If any provision of this AGREEMENT is held to be invalid, illegal or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions of this AGREEMENT shall continue in full force and effect.

H. Mediation. In the event of any controversy or claim arising out of or relating to this AGREEMENT or the Services provided by DB Firm (each referred to as a "Dispute" and all collectively referred to as the "Disputes"), the parties shall try to resolve all Disputes through good faith, direct discussions involving the representatives of each party who possess the necessary authority to resolve such Dispute. If direct discussions are unsuccessful in resolving a Dispute, the Parties shall endeavor to resolve the matter by mediation through and administered by JAMS or its successor in interest. JAMS shall provide the parties with the name of five (5) qualified mediators. Each party shall have the option to strike two of the five mediators selected by JAMS, and thereafter the mediator remaining shall hear the Dispute. If the Dispute remains unresolved after mediation, either party may commence litigation.

I. Costs and Attorney' Fees. If either party commences any legal action against the other party arising out of this AGREEMENT or the performance thereof, the prevailing party in such action may recover its reasonable litigation expenses, including court costs, expert witness fees, discovery expenses, and attorneys' fees.

J. Entire AGREEMENT. This AGREEMENT constitutes the entire AGREEMENT between the parties relative to the services specified herein and no modification hereof shall be effective unless and until such modification is evidenced by a writing signed by both parties to this AGREEMENT. There are no understandings, agreements, conditions, representations, warranties or promises, with respect to this AGREEMENT, except those contained in or referred to in writing.

K. Execution. This AGREEMENT may be executed in several counterparts, each of which shall constitute one and the same instrument and shall become binding upon the parties when at least one copy has been signed by both parties.

L. Authority to Enter AGREEMENT DB Firm warrants that it has all requisite power and authority to conduct its business and to execute, deliver, and perform this AGREEMENT. Each party warrants to the other that the signature to this AGREEMENT have the legal power, right, and authority to enter into this AGREEMENT and to bind each party.

M. California Prevailing Wage Requirement Pursuant to California Labor Code sections 1720 through 1861, the DB Firm, its Contractor and all subcontractors shall ensure that all workers who perform WORK under this AGREEMENT are paid not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations (DIR), if applicable. This includes WORK performed during the design, site assessment, feasibility study, and other preconstruction phases of construction, including but not limited to inspection and land surveying WORK, regardless of whether any further construction WORK is conducted, and WORK performed during the post-construction phases of construction, including but not limited to all cleanup WORK at the jobsite. The most current prevailing wage determination can be found at <https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>.

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N. CITY'S Expectations. The following is a list of the CITY'S expectations shall be incorporated into the DB Firm's contract:

1. Understand the WORK as designed or know where to research the documents for information.
2. Respond to all of the CITY'S questions no matter how small they may seem.
3. Talk with the CITY about the planned design and what goals are going to be achieved. Follow up on any outstanding issues, inquiries from the CITY, etc.
4. Think ahead of possible utility conflicts.
5. Observe the field conditions and discuss with CITY any discrepancies.
6. Maintain a professional appearance during all meetings including in-person meetings and virtual meetings. This includes an understanding of virtual meeting software, in addition to, the use of a professional background, use of adequate equipment including camera, laptop, lighting, microphone, etc.
7. When issues arise, work with all parties to come-up with a solution and take a position that provides the greatest benefit to the CITY.
8. Review initial draft of the progress billing request prior to submittal to CITY'S project manager.
9. Return all phone calls from CITY project management staff on the same business day.
10. Provide CITY with all known scheduled time off during the Project duration. Review time off impacts to project and project coverage with CITY at least one weeks in advance, or as soon as practicable.
11. No proprietary software shall be used in conjunction with this Project.

O. DB Firm's Representations. DB Firm shall be deemed to have made the following representations with its submission of the GMP Proposal:

1. DB Firm has examined, carefully studied, and thoroughly understands the AGREEMENT DOCUMENTS and the Reference Documents associated with the WORK.
2. DB Firm has visited the Site and is familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the WORK.
3. DB Firm is familiar with and is satisfied as to all laws and regulations that may affect cost, progress, and performance of the WORK.

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4. DB Firm is aware of the general nature of WORK to be performed by CITY and others at the Site that relates to the WORK as indicated in the AGREEMENT DOCUMENTS.

5. DB Firm has correlated the AGREEMENT DOCUMENTS with the information known to DB Firm, information and observations obtained from visits to the Site, reports and drawings identified in the AGREEMENT DOCUMENTS, and all additional examinations, investigations, explorations, tests, studies and data.

6. DB Firm has given CITY written notice of all conflicts, errors, ambiguities or discrepancies that DB Firm has discovered in the AGREEMENT DOCUMENTS before submitting a GMP Proposal and the written resolution thereof by CITY is acceptable to DB Firm.

7. The AGREEMENT DOCUMENTS are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the WORK.

8. DB Firm shall be bound by and shall perform its obligations in full compliance with the AGREEMENT DOCUMENTS.

9. DB Firm shall be liable for its actions, including its negligence or gross negligence, and shall be liable for the acts, omissions, or errors of its agents or employees.

10. DB Firm shall perform its obligations under this AGREEMENT using its best professional skill and judgment, acting with due care and in accordance with the standard of care applicable to the WORK and Services to be provided by DB Firm, the covenants, terms and conditions of this AGREEMENT, and all applicable laws, codes, rules and regulations of the State of California and all other federal, state, and local jurisdictions having authority. DB Firm represents and warrants that it is fully experienced in projects of the nature and scope of WORK, and that it is properly qualified, licensed and equipped to supply and perform the WORK. The WORK completed herein must meet the approval of CITY and shall be subject to CITY'S general right of inspection and supervision to secure the satisfactory completion thereof.

11. DB Firm agrees that all technologies, formulae, procedures, processes, methods, writings, ideas, dialogue, compositions, recordings, teleplays and video productions prepared for, written for, or submitted to CITY and/or used in connection with this AGREEMENT, shall either be the property of DB Firm, or DB Firm shall have all necessary rights to use such formulae, procedures, processes, methods, writings, ideas, dialogue, compositions, recordings, teleplays and video productions and to provide the same and derivative works thereof to CITY in connection with this AGREEMENT, and shall not otherwise be copied in whole or in part from any other source.

12. Except with respect to design pre-check documents and associated works and other third party intellectual property used by DB Firm on an authorized basis, all drawings, specifications, calculations, data, notes and other materials and documents, including electronic data (other than system performance data

provided during operation, which shall not be deemed "WORK PRODUCT") furnished by DB Firm to CITY under this AGREEMENT ("WORK PRODUCT") shall be and remain the property of CITY. DB Firm, or the author of such works, if other than DB Firm, will retain all common law, statutory and other reserved rights, including copyrights in the WORK PRODUCT. Upon Final Completion, DB Firm will grant CITY, and its successors and assigns, a perpetual, non-transferable royalty-free license to use the WORK PRODUCT (excluding commercially provided hardware and software) for the purposes of repair, maintenance, renovation, modernization, and all other purposes related to the Project, including, without limitation, additions, alignments, or other development on the Site. CITY's use of such WORK PRODUCT without the involvement of the DB Firm shall be at CITY's sole risk and without liability or legal exposure to the DB Firm or anyone working by or through DB Firm. CITY understands that the use of commercially provided hardware and software may require the CITY to pay annual fees for such use. If the DB Firm purchases a license for any commercial provided hardware or software as part of the WORK, DB Firm shall transfer such license to the CITY upon final completion.

P. Defined Terms. Terms used in this AGREEMENT and not defined herein shall have the meanings indicated in the GENERAL CONDITIONS (**EXHIBIT "D"**).

Q. Exhibits. The following exhibits ("Exhibits") are specifically made part of, and incorporated by reference into, this AGREEMENT:

Exhibit "A"	DB Firm Proposal/Scope of Work Pre-construction Phase Services
Exhibit "B"	Fee Schedule
Exhibit "C"	Certificate of Compliance with Labor Code § 3700
Exhibit "D"	General Conditions
Exhibit "E"	Supplementary General Conditions
Exhibit "F"	CA Government Code Section 14310 Questionnaire
Exhibit "G"	Equal Employment Opportunity Certification
Exhibit "H"	Public Contract Code Section 10285.1 Certification
Exhibit "I"	Public Contract Code Section 10232 Certification
Exhibit "J"	Debarment and Suspension Certification
Exhibit "K"	Local Business Enterprise
Exhibit "L"	Non Lobbying Certification
Exhibit "M"	Site Visit Affidavit

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Exhibit "N"	Acknowledgement of Insurance Requirements
Exhibit "O"	Non-Collusion Affidavit
Exhibit "P"	DIR Compliance Affidavit
Exhibit "Q"	Statement Acknowledging Penal and Civil Penalties Concerning The Contractors' Licensing Laws
Exhibit "R"	Faithful Performance Bond
Exhibit "S"	Payment Bond
Exhibit "T"	Warranty Bond
Exhibit "U"	Workers' Compensation Insurance
Exhibit "V"	Insurance and Indemnification Documents
Exhibit "W"	Project Preliminary Design Report
Exhibit "X"	City of Manteca Conflict of Interest Policy
Exhibit "Y"	DB Firm Conflict of Interest Statement

R. Order of Precedence of the AGREEMENT DOCUMENTS. Notwithstanding anything in Paragraph 1(A) of this AGREEMENT, the following order of precedence shall apply in the case of direct, irresolvable conflicts between or among AGREEMENT DOCUMENTS:

1. Work Change Directives, Change Orders, and Field Orders with those of a later date taking precedence;
2. Written amendments signed by the Parties with those of a later date taking precedence;
3. This AGREEMENT, including all Exhibits;
4. The Final Drawings and Specifications;
5. Procurement Solicitation Documents (Notice Inviting Bids, Information to Bidders, Request for Qualifications, Request for Proposals, etc.)
6. Any provisions required by law or applicable regulations, whether inserted or not
7. Appendices (photographs, data contained in reports, and other information)

The singular includes the plural; the masculine, feminine, and neuter genders shall each be deemed to include the others; "shall," "will," or "agrees" are mandatory; "may" is permissive;

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“or” is not exclusive; “include,” “includes” and “including” are not limiting and shall be construed as if followed by the words “without limitation;” and “days” means calendar days unless specifically provided otherwise if there is more than one signer of this AGREEMENT, the signer obligations are joint and several. The failure to capitalize a defined term shall not automatically revert that term to its commonly accepted definition outside of this AGREEMENT (i.e., dictionary definition).

S. AGREEMENT Interpretation. Additionally, the following interpretation principles shall apply to this AGREEMENT:

1. Written numbers over figures, unless obviously incorrect.
2. Figured dimensions over scaled dimensions.
3. Large-scale drawings over small-scale drawings.
4. Any conflict between a bill or list of materials shown in the AGREEMENT DOCUMENTS and the actual quantities required to complete the WORK required by AGREEMENT DOCUMENTS, will be resolved in favor of the actual quantities, date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

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Progressive Design Build Agreement for Services

TO EFFECTUATE THIS AGREEMENT, each of the parties has caused this AGREEMENT to be executed by its duly authorized representative as of the date set forth in the introductory paragraph on page 1 above.

CITY OF MANTECA:

DB FIRM:

Toni Lundgren
City Manager

C. OVERAA & CO.

(Type name of Consultant/form of organization)*

ATTEST:

Cassandra Candini-Tilton,
Director of Legislative Services

By:

(Signature) *A. Corby Paver*

(Type name and title) *A. Corby Paver, COO*

COUNTERSIGNED:

Matthew Boring
Director of Finance

By:

(Signature) *Carl Overaa*

(Type name and title) *Carl Overaa, President*

COUNTERSIGNED:

Address: _____

Stephanie Van Steyn,
Director of Human Resources

Telephone: _____

APPROVED AS TO FORM:

Andy Pinasco, Interim City Attorney
By: Kousha Mckeenejad, Deputy City Attorney

EXHIBIT "A"

DB Firm Proposal/Scope of Work
Pre-construction Phase Services

PRECONSTRUCTION PHASE DETAILED SCOPE OF SERVICES

As a value-added option, Overaa/PACE has included an allowance within our proposed fee to support formal third-party team partnering, should the City find it beneficial. This approach is not required for successful project delivery, but is available to further support alignment, collaboration, and shared understanding among the project team.

If the City elects to utilize this option, the selection of the partnering facilitator, the scope of engagement, and the session frequency would be determined collaboratively with the City and Carollo. The intent is to provide a structured forum for goal alignment, communication, and team effectiveness in a manner that complements our team's established communication and collaboration processes.

In addition, we have included an allowance for Computational Fluid Dynamics (CFD) modeling, similar to the analysis performed on the City's South Plant Project last year. If requested by the City, this work could be performed by Steve Saunders for an estimated cost of approximately \$25,000, and may be used to further evaluate hydraulic performance, flow distribution, and process optimization as the design advances.

With respect to the number of meetings required per the RFP, Overaa/PACE fully recognizes and supports the City's minimum requirements for workshops, reviews, and coordination touchpoints during Preconstruction and Construction. However, as a proven design-build team with extensive experience working together at the WQCF, we believe there may be opportunities to streamline and, where appropriate, consolidate certain meetings if acceptable to the City — without reducing transparency, technical rigor, or operational coordination. Any such adjustments would be discussed and agreed upon collaboratively with the City and Carollo, and where meetings are reduced, we anticipate a commensurate fee savings — on the order of \$100,000 or more — aligned with the replicated meeting line items in the fee estimate worksheet.

TASK #	SCOPE	DELIVERABLES
A – Management		
A.1	Kick Off Mtg	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Permitting Lead Ashley Green or Design Specialist Tahir Maqbool will prepare for, attend, and provide minutes for a project kickoff meeting to strategize on the design direction alternatives, criteria, and considerations for 25% preliminary design in the first 100 days. Overaa PDB Executive Nick Kebbas, PDB Manager Ryan James, Construction Manager Manuel Azevedo, Superintendent Rick Wilson, and Estimator Anna Stien will attend and participate in the kick-off meeting to provide constructability and preliminary cost feedback on design alternatives.
A.2	10-12 Monthly Progress Meetings	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will prepare for, attend, and provide minutes for an estimated 10-12 monthly progress meetings to confirm design progress. Overaa PDB Manager Ryan James, Construction Manager Manuel Azevedo, Superintendent Rick Wilson, and Estimator Anna Stien will attend and participate in the Monthly Progress Meetings.
A.3	Add 12 Workshop Meetings	Design QAQC Jamie Matthews, Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Permitting Lead Ashley Green or Design Specialist Tahir Maqbool will prepare for, attend, and provide minutes for an additional 12 design workshops to strategize on the design direction alternatives, criteria, and considerations for 25%, 50%, and 75% design progression. Overaa PDB Manager Ryan James, Construction Manager Manuel Azevedo, Superintendent Rick Wilson, and Estimator Anna Stien will attend and participate in the Additional Workshop Meetings.
A.4	Design Schedule	Design Manager Andy Komor, Design Engineer Jose Salgado, and Project Coordinator Samantha Kamps will provide a live updated Microsoft Project design schedule for the UV and Centrate Projects with milestones and City review times including subconsultant design progress schedule. Overaa PDB and Construction Managers, Ryan James and Manuel Azevedo will provide constructability feedback to Pace for Design Schedule development.

TASK #	SCOPE	DELIVERABLES
A.5	Design Schedule	Senior ACAD Technicians Tom Gutierrez and Daniel Sanchez will manage the sheet-set manager with all digital files index and live availability on the project server for viewing. Project Coordinator Samantha Kamps and other team members will provide City-standard specs, report, and cost takeoffs in City standard format. Overaa PDB and Construction Managers, Ryan James and Manuel Azevedo will build and manage a Procore-based document management system for File Management.
A.6	Monthly Invoice Work Summary	Design Manager Andy Komor, Design Engineer Jose Salgado, and Project Coordinator Samantha Kamps will provide monthly detailed work summaries included with each monthly invoice (similar to existing PACE/City project invoicing) with hourly breakdown per employee, work product completed with deliverables, scope completed, and information/challenges related to the scope completion and next steps. Overaa Construction Manager, Manuel Azevedo will provide hourly breakdowns for Overaa staff in coordination with PACE.
A.7	Partnering Workshop	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Permitting Lead Ashley Green will attend a project partnering event with the project team. All Overaa project team will attend the partnering event.

B – Design Development

B.1.1.1a	UV 25% Design Report	PACE shall provide a 25% level UV-design report including alternatives analysis consisting of the following: compile existing UV-related data, formulate and evaluate and select ideal systems locations, evaluate and identify appropriate treatment unit processes and sizing including new UV system with corresponding calculations, provide sizing, evaluate concepts and alternatives for retrofitting the existing facility and incorporating new systems, provide development of project phasing with ideal treatment trains and water depth to optimize the structures, develop ideas for configuring the site and structures to optimize the multiple functions and access to equipment, provide early phase architectural renderings model of the proposed facility, calculate the estimated power use for the facilities. The report will be tailored toward a permitting application document with virus validation information, appropriate design criteria, and alarming systems meeting DDW requirements. Overaa will provide constructability and cost estimate feedback to PACE throughout the 25% Design Reporting.
B1.1.1b	UV 25% Specifications	PACE shall provide 25% Level UV Equipment Specifications for a Performance Based Bid Solicitation including Trojan UV. PACE shall also provide additional important UV-related Specifications as follows: a) Summary of Work Description, b) Sequence of Construction Description, c) Control Strategy Sequence of Operation Description, and d) Earthwork / Soil Amendments (as necessary) for client review. ENGEO shall provide geotechnical services for a geotechnical specifications for the UV project. Overaa will provide supplier contact and feedback to PACE throughout the 25% Specification development.
B1.1.1c	UV 25% Design Plans	PACE shall provide initial UV-system 3D model renderings of the various alternatives. Once selected the preferred alternative, PACE shall provide a 25% level UV design plans consisting of 25% level of detail including general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed UV facility, including process tanks/channels and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 25% equipment list will be provided and will be based on early phase major equipment specifications. MacKay and Somsps shall provide surveying services for the purposes of basefiles needed for the UV project. Overaa will provide constructability and cost estimate feedback to PACE throughout the 25% Design Plans development.

TASK #	SCOPE	DELIVERABLES
B1.2.1a	Centrate 25% Design Report	PACE shall provide a 25% level centrate design report including alternatives analysis consisting of the following: compile existing centrate-related data, formulate and evaluate and select ideal systems locations, evaluate and identify appropriate treatment unit processes and sizing including new centrate treatment, upstream storage/pumping, and chemical storage system with corresponding calculations, provide sizing, evaluate concepts and alternatives for retrofitting the existing facility and incorporating new systems, provide development of project phasing with ideal treatment trains and water depth to optimize the structures, develop ideas for configuring the site and structures to optimize the multiple functions and access to equipment, provide early phase architectural renderings model of the proposed facility, calculate the estimated power use for the facilities. An updated BioWin and WaterPro chemistry model will be prepared and included in the report. Overaa will provide constructability and cost estimate feedback to PACE throughout the 25% Design Report development.
B1.2.1b	Centrate 25% Specifications	PACE shall provide 25% Level Centrate Equipment Specifications for a Performance Based Bid Solicitation including Veolia Anitamox Centrate Treatment. PACE shall also provide additional important 25% Level centrate-related Specifications as follows: a) Summary of Work Description, b) Sequence of Construction Description, c) Control Strategy Sequence of Operation Description, and d) Earthwork / Soil Amendments (as necessary) for client review. ENGEO shall provide geotechnical services for a geotechnical specifications for the centrate project. Overaa will provide supplier contact and feedback to PACE throughout the 25% Specification development.
B1.2.1c	Centrate 25% Design Plans	PACE shall provide initial centrate-system 3D model renderings of the various alternatives. Once selected the preferred alternative, PACE shall provide a 25% level centrate design plans consisting of 25% level of detail including general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed UV facility, including process tanks, pump station, underground storage, chemical farm, and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 25% equipment list will be provided and will be based on early phase major equipment specifications. MacKay and Somps shall provide surveying services for the purposes of basefiles needed for the centrate project. Overaa will provide constructability and cost estimate feedback to PACE throughout the 25% Design Plan Development.
B1.3.2a	UV 50% Design Report	PACE shall provide a 50% level UV-design report including the selected UV system alternative and equipment information design criteria and basis of design information and calculations, hydraulic systems design, description of unit processes and sizing, provide description of project phasing with ideal treatment trains, and calculate the estimated power use for the facilities. The report will be tailored toward a permitting application document with virus validation information, appropriate design criteria, and alarming systems meeting DDW requirements. Overaa will provide constructability and cost estimate feedback to PACE throughout the 50% UV Design Report development.
B1.3.2b	UV 50% Specifications	PACE shall provide 50% Level Specifications for the UV Project including updates to the four 25% Specifications and drafts of the entire specifications package for assistance in GMP pricing of the entire project. Overaa will provide supplier contact and feedback to PACE throughout the 50% UV Specification development.

TASK #	SCOPE	DELIVERABLES
B1.3.2c	UV 50% Design Plans	PACE shall provide 50% level UV design plans consisting of general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed UV facility, including process tanks/channels and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 50% equipment list will be provided and will be based on early phase major equipment specifications. Overaa will provide constructability and cost estimate feedback to PACE throughout the 50% UV Design Plan Development.
B1.4.2a	Centrate 50% Design Report	PACE shall provide a 50% level centrate-design report including the selected UV system alternative and equipment information design criteria and basis of design information and calculations, hydraulic systems design, description of unit processes and sizing, provide description of project phasing with ideal treatment trains, and calculate the estimated power use for the facilities. An updated BioWin and WaterPro chemistry model will be prepared and included in the report. Overaa will provide constructability and cost estimate feedback to PACE throughout the 50% Centrate Design Report Development.
B1.4.2b	Centrate 50% Specifications	PACE shall provide 50% Level Specifications for the centrate Project including updates to the four 25% Specifications and drafts of the entire specifications package for assistance in GMP pricing of the entire project. Overaa will provide supplier contact and feedback to PACE throughout the 50% Centrate Specification development.
B1.4.2c	Centrate 50% Design Plans	PACE shall provide 50% level centrate design plans consisting of general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed centrate facility including process tanks, pump station, underground storage, chemical farm, and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 50% equipment list will be provided and will be based on early phase major equipment specifications. Overaa will provide constructability and cost estimate feedback to PACE throughout the 50% Centrate Design Plan Development.
B1.5.3a	UV 75% Design Report	PACE shall provide a 75% level UV-design report including the selected UV system alternative and equipment information design criteria and basis of design information and calculations, hydraulic systems design, description of unit processes and sizing, provide description of project phasing with ideal treatment trains, and calculate the estimated power use for the facilities. The report will be tailored toward a permitting application document with virus validation information, appropriate design criteria, and alarming systems meeting DDW requirements. Overaa will provide constructability and cost estimate feedback to PACE throughout the 75% UV Design Report development.
B1.5.3b	UV 75% Specifications	PACE shall provide 75% Level Specifications for the UV Project including updates to the four 25% Specifications and drafts of the entire specifications package for assistance in GMP pricing of the entire project. Overaa will provide supplier contact and feedback to PACE throughout the 75% UV Specification development.
B1.5.3c	UV 75% Design Plans	PACE shall provide 75% level UV design plans consisting of general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed UV facility, including process tanks/channels and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 75% equipment list will be provided and will be based on early phase major equipment specifications. Overaa will provide constructability and cost estimate feedback to PACE throughout the 75% UV Design Plan Development.

TASK #	SCOPE	DELIVERABLES
B1.6.3a	Centrate 75% Design Report	PACE shall provide a 75% level centrate-design report including the selected UV system alternative and equipment information design criteria and basis of design information and calculations, hydraulic systems design, description of unit processes and sizing, provide description of project phasing with ideal treatment trains, and calculate the estimated power use for the facilities. An updated BioWin and WaterPro chemistry model will be prepared and included in the report. Overaa will provide constructability and cost estimate feedback to PACE throughout the 75% Centrate Design Report Development.
B1.6.3b	Centrate 75% Specifications	PACE shall provide 75% Level Specifications for the centrate Project including updates to the four 25% Specifications and drafts of the entire specifications package for assistance in GMP pricing of the entire project. Overaa will provide supplier contact and feedback to PACE throughout the 75% Centrate Specification development.
B1.6.3c	Centrate 75% Design Plans	PACE shall provide 75% level centrate design plans consisting of general, civil, dimensioned layouts of the various facilities, updated architectural renderings, mechanical, electrical, and process and instrumentation for the proposed centrate facility, including process tanks, pump station, underground storage, chemical farm, and building. The civil design will be provided in civil3D with estimates of cut and fill volumes. Mechanical design will include autoCAD MEP 3D design sheets and 2D plan and section. A 75% equipment list will be provided and will be based on early phase major equipment specifications. Overaa will provide constructability and cost estimate feedback to PACE throughout the 75% Centrate Design Plan Development.
B2	Advisory Consulting	PACE shall provide overall QAQC Feedback and advisement on critical items including planning, design, and construction items including constructability, material availability, vendor quality, timing of purchasing, and other pertinent items to the quality of the design. Overaa will provide constructability review and material availability feedback to the PACE and the City.
B3	20 x 3rd Party CM Meetings	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will prepare for, attend, and provide minutes for an estimated 20 meetings with 3rd Party CM to confirm design.
B4	6 x Constructability Workshops	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will prepare for, attend, and provide minutes for an estimated 6 milestone design workshops with the City and 3rd Party CM to confirm design.
B5	Maintain Decision Log Matrix Excel Workbook	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will maintain a workbook decision matrix log throughout the pre construction progress to track comments and responses.
B6	VE Ideas Workbook	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will maintain a VE concepts workbook log throughout the pre construction progress to track ideas and progress.
B7	4 x Value Engineering Workshops	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will prepare for, attend, and provide minutes for an estimated 4 VE design workshops with the City and 3rd Party CM to confirm design.
B8	Add Details Identification	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will maintain a workbook log of missing details throughout the pre construction progress to track remaining missing details and acceleration concepts.
B9	Identify Elements Not Needing 100% Design	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will maintain a workbook log of items not requiring 100% Design throughout the pre construction progress to track elements of DB not needing design by engineer.

TASK #	SCOPE	DELIVERABLES
B10	Additional Studies	ENGEO and MacKay and Soms are providing Geotech and Survey work as a PACE sub agreement as included in 25% Design Specs (geotech) and Plans (survey) - not included in this task. If applicable, PACE shall identify any other work products/studies needed by others if applicable. PACE shall review operations data, heating systems existing, existing power studies, corrosion studies, existing record drawings, and existing design reports and specifications provided by others pertinent to the project.
B11	O&M and R&R Support and Recommendations	Design Manager Andy Komor, Civil/Mechanical Lead Robert Murphy, and Design Engineer Jose Salgado will maintain a workbook log of operations observations and recommendations throughout the pre construction progress to track elements relevant to the UV and centrate upgrades.

C – Project Schedules

C1	Prepare Precon Phase Schedule	Overaa will develop the Preconstruction Phase Project Schedule based on the Baseline Preconstruction Phase Schedule in the RFP.
C2	Draft format for Baseline Construction Phase Project Schedule	Overaa will present the Baseline Construction Phase Schedule in a P6 format for the City to review.
C3.1.1	Draft WBS for Baseline Construction Phase Schedule	Overaa will develop the Preconstruction Phase Project Schedule based on the Baseline Preconstruction Phase Schedule in the RFP.
C3.1.2	Draft WBS for GMP Cost Model	Overaa will develop a draft of Work Breakdown Structure activities that will serve as the basis of the GMP Cost model.
C4	50% Design Baseline Construction Phase Schedule	Overaa will develop a Baseline Construction Phase Schedule to accompany the 50% Design.
C5	75% Design (at GMP Proposal) Baseline Construction Phase Schedule	Overaa will update the Baseline Construction Phase Schedule to accompany the 75% Design and serve as a basis for the GMP Cost Model.

D – Procurement & GMP Development

D1.1.1	Develop and Submit Self-Preform/Subcontract plan	Overaa will develop a plan to maximize benefit to the Project though a combination of self=performed work and Subcontracted tasks. The plan will include our approach to Subcontractor selection based on best value and our unique knowledge of the most qualified Central Valley partners.
D1.1.2	Revise and Submit Self-Preform/Subcontract Plan	Overaa will update the Subcontracting Plan based on feedback from the City to maximize benefit to the Project.
D2	Bids and Proposals Workshop	Overaa will provide recommendations to assist in bids and proposals for the major elements of the Construction Phase.
D3	Project Equipment Pre-Selection Workshop	Overaa will support the City with our unique knowledge and long-standing relationships with equipment suppliers and manufacturers to maximize benefit to the Project.
D4	Long-Lead Equipment and Risk Mitigation Workshop	Overaa will identify early any material or equipment that will have long-lead impacts to the Construction Phase Schedule.
D5	Draft Subcontractor Procurement Plan	Overaa will develop a Subcontractor Procurement Plan and DBE Participation Plan to serve as a guide to selecting the most qualified partners as well as a tool to evaluate value-based and low-bid proposals.
D6	Subcontractor Procurement Plan Workshop	Overaa will participate in a Workshop to review the Subcontractor Plan with the City and Project Team.
D7	Final Subcontractor Procurement Plan	Overaa will review and finalize the Subcontractor Procurement Plan based on the Workshop feedback.

TASK #	SCOPE	DELIVERABLES
D8	Draft GMP Cost Model	Overaa will prepare and draft the GMP Cost Model to manage the Open Book GMP development. The model will incorporate a trade-by-trade estimate covering all Construction Phase work with breakdown for Labor, Equipment, Material and Subcontracted scopes. The GMP model will allow for benchmarking against historical project data, market trends, and independent estimates when necessary. The GMP Cost model will identify all potential Subcontractors and help facilitate early budget pricing through pre-qualified trade partners when applicable. The GMP Cost model will also identify any Contingencies or Allowances as dictated by the Risk Register. Clear roles will be defined for who controls each Contingency or Allowance. All assumptions, cost-saving alternatives, and risk-reduction strategies will be clearly define in the Cost Model.
D9	GMP Cost Model Workshop	Overaa will attend and participate in the GMP Cost Model Workshop to further evaluate each aspect of the model with the City.
D10	Final GMP Cost Model	Overaa will revise the Cost Model based on feedback from the Workshop and prepare a final version for use in the GMP Development.
D11.1.1	Draft 50% Design GMP Cost Model	Overaa will prepare the first GMP cost estimate at the 50% Design progression. All cost estimates will include a clear narrative, based on the Summary Log of design changes, to provide clear disclosure of all cost changes.
D11.1.2	Draft 75% Design GMP Cost Model	Overaa will prepare an updated GMP cost estimate at the 75% Design progression. All cost estimates will include a clear narrative, based on the Summary Log of design changes, to provide clear disclosure of all cost changes.
D12.1.1	50% Design GMP Cost Model Workshop	Overaa will attend and participate in the 50% Design GMP Cost Model Workshop to further evaluate each aspect of the model with the City.
D12.1.2	75% Design GMP Cost Model Workshop	Overaa will attend and participate in the 75% GMP Cost Model Workshop to further evaluate each aspect of the model with the City.
D13.1.1	Submit Revised 50% GMP Cost Model	Overaa will revise the 50% Design Cost Model based on feedback from the Workshop and prepare a final version for use in the GMP Development.
D13.1.2	Submit Revised 75% GMP Cost Model	Overaa will revise the 75% Design Cost Model based on feedback from the Workshop and prepare a final version for use in the GMP Development.
D14	Monthly GMP Cost Model Summary	GMP Cost Model summaries will be provided on a monthly basis to document design changes and cost impacts based on the Summary Log of design changes.
D15	Draft Final 75% Design GMP Proposal	Overaa will provide the initial draft of the GMP Proposal at the 75% Design phase. The GMP Proposal will be based on the GMP Cost Model and include the Construction Phase Submittal List, Baseline Construction Phase Project Schedule, Project Cash Flow diagram, 75% Design Plan and Specification, clearly defined Contingencies and Allowances along with the plan for which entity would control each cost, and a list of all assumptions used in the Proposal.
D16	Final 75% Design GMP Proposal Workshop	Overaa will attend and participate in the Final 75% GMP Proposal Workshop to further evaluate each aspect of the Proposal with the City.
D17	Submit Final 75% Design GMP Proposal	Overaa will revise the 75% Design GMP Proposal based on feedback from the Workshop and prepare a final version for City consideration.
E – Management Plans		
E1	Draft / Submit Construction Management Plan for Construction Phase Work	Overaa PDB and Construction Managers, Ryan James and Manuel Azevedo will draw from Overaa's best practices and develop a Construction Management Plan to guide the Project through organized communication, HSE procedures, Risk Management, Quality Control procedures, Site logistics, sequence and scheduling, noise control, SWPPP, and cost control. The Construction Management Plan will be aligned with all Contract requirements, Owner standards, constraints of an occupied facility, and any unique local requirements.
E2	Final Construction Management Plan for Construction Phase Work	Overaa will revise and update the Construction Management Plan based on feedback from the City.

TASK #	SCOPE	DELIVERABLES
E3	Draft Risk Management Plan for Construction Phase Work	Overaa will prepare a Risk Management Plan based on the Risk Register. The Risk Register will be maintained and updated, at least monthly, to review and revise probability of each item's impact on the Project from both a cost and time analysis, as well as assignments of the items to the best party best equipment to manage each risk. Mitigation Plans for each item will be reviewed and incorporate in the Risk Management Plan.
E4	Quarterly Risk Management Workshop	Overaa will attend and participate in Quarterly Risk Management Workshops to further evaluate each aspect of the Risk Management Plan with the City.
E5	Draft / Submit Project Commissioning Plan	Overaa will develop a first draft Project Commissioning Plan to define the process, roles, responsibilities, and documentation required to verify that all systems are designed, installed, tested, and operated in accordance with the Owner's Project Requirements (OPR), Basis of Design (BOD), and applicable codes. Early engagement of O&M Staff will be a key aspect of the Commissioning Plan. The Commissioning Plan will identify the Commissioning Authority (CxA) and delineate both Functional and Operational test processes. Witness-Point and Hold-Point inspection and verification milestones will be identified and all Training and Documentation procedures will be aligned with Turnover and Acceptance reporting. Our approach is to build with the end in mind and close-as-we-go to ensure no small details are left behind to create larger issues further into the Project.
E6	Project Commissioning Plan Workshop	Overaa will attend and participate in Commissioning Plan Workshop to further evaluate each aspect of the Commissioning Plan with the City.
E7	Final Project Commissioning Plan	Overaa will revise and update the Commissioning Plan based on feedback from the City.

EXHIBIT “B”

Fee Schedule

APPENDIX A

FEE PROPOSAL

		OVERAA							PACE											SGH	MACKAY & SOMPS	ENGEO	Overaa Task Subtotals	PACE Task Subtotals	SGH Task Subtotals	M&S Task Subtotals	ENGEO Task Subtotals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		Nick Kebbas PDB Executive	Ryan James PDB Manager	Manuel Azevedo Construction Manager	Rick Wilson Superintendent	Anna Stein Construction Estimator	Steve Davies Corporate Scheduler	Brian Stewart Construction QA/QC	J Matthews QA/QC	A Komor Manager	R Murphy Sr PE	J Salgado Design Eng	A Green Permit	T Maqbool Specialist	B Ishaq EE	E Camarena Controls	T Gutierrez / D Sanchez Sr CAD	S Kamps Coord	Structural									Survey	Geotech																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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ATTACHMENT 3

APPENDIX A \\ FEE PROPOSAL

		OVERAA						PACE														SGH	MACKAY & SOMPS	ENGO	Overaa Task Subtotals	PACE Task Subtotals	SGH Task Subtotals	M&S Task Subtotals	ENGO Task Subtotals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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* Not including partnering allowance

Request For Proposals
Progressive Design-Build Services - Sidestream Treatment and UV Rehabilitation

FEE PROPOSAL FORM

Note: *Proposers should review Section V (A) (5) of this RFP for information regarding the completion and City use of this form.*

1. Preconstruction Phase Services Fee

The Preconstruction Phase Services Fee shall be provided as a not-to-exceed amount (in number and words).

\$2,397,730.00* Two Million Three Hundred Ninety Seven Thousand Seven Hundred and Thirty Dollars*

*Fee includes an Allowance of \$46,500.00 for Partnering. This will cover up to 6 meetings and 10 surveys. Any unused portion will be returned to the City.

2. Construction Phase Work Fee Percentage

The Construction Phase Work Fee Percentage shall apply to Construction Phase work and shall be provided as a percentage of the cost of the Construction Phase Work (expressed in numbers and words).

_____ 10 _____ % _____ TEN _____ percent

3. Construction Phase Work Subcontractor Mark-up

The Construction Phase Work Subcontractor Mark-up shall apply to Construction Phase work and shall be provided as a percentage of the cost of the Construction Phase Work provided by subcontractors to the PDB Team (expressed in numbers and words).

_____ 10 _____ % _____ TEN _____ percent

4. Construction Phase Work Major Equipment Mark-up

The Construction Phase Work Major Equipment Mark-up shall apply to Construction Phase work and shall be provided as a percentage of the cost of the Major Equipment portion of the Construction Phase Work (expressed in numbers and words).

_____ 10 _____ % _____ TEN _____ percent

5. Preconstruction Phase Personnel Rates and Prices - See attached.

To be provided by Proposer. See Section V (A) (5).

6. Preconstruction Phase Other Direct Costs - None

To be provided by Proposer. See Section V (A) (5).

BASELINE PRECONSTRUCTION PHASE SCHEDULE

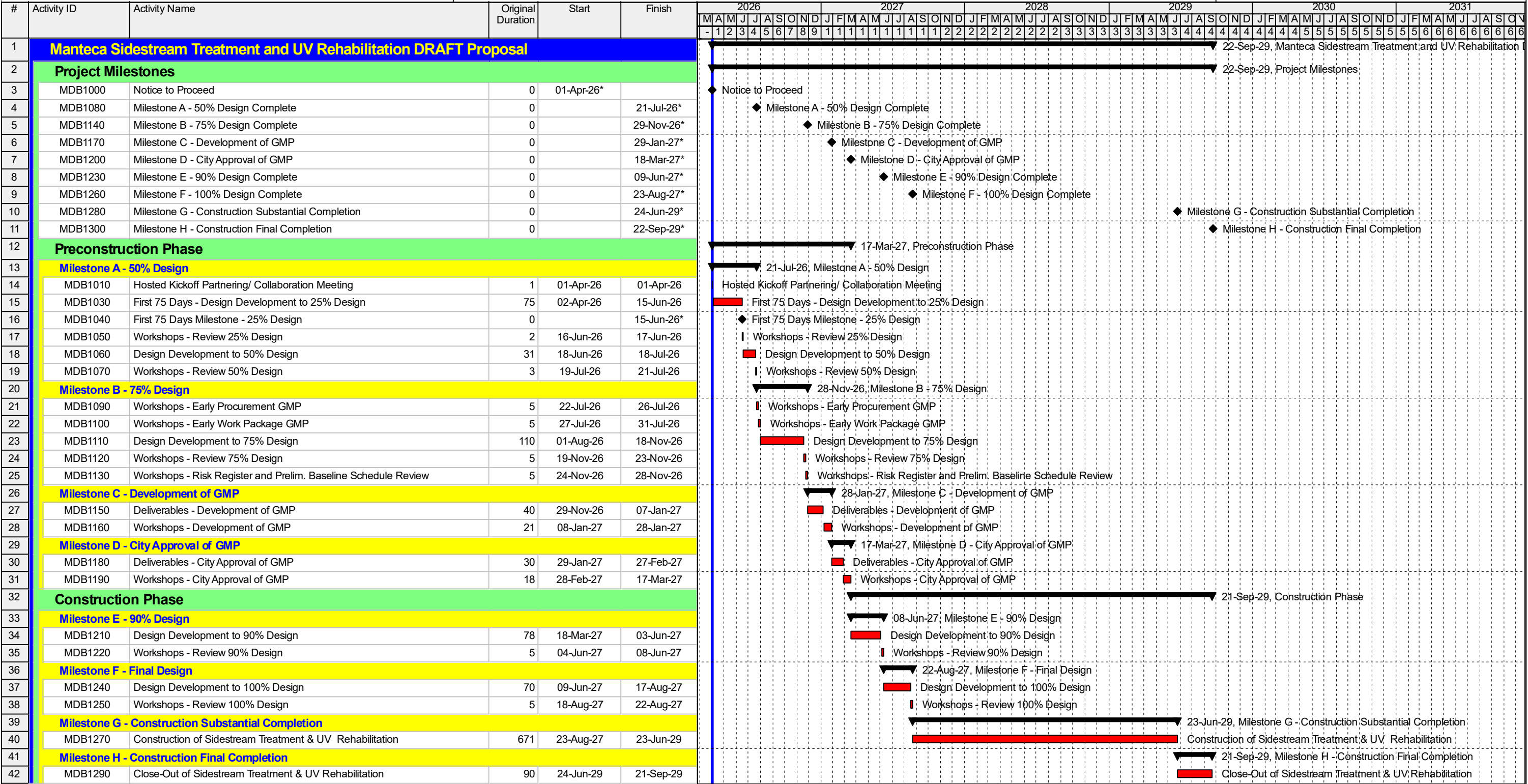


EXHIBIT “C”

CERTIFICATE OF COMPLIANCE WITH LABOR CODE § 3700
[Labor Code § 1861]

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

DB FIRMS

By: _____
[Title]

EXHIBIT “D”

General Conditions

**STANDARD
GENERAL CONDITIONS
OF THE
CONSTRUCTION CONTRACT**

CITY OF MANTECA

These General Conditions are based in part on
EJCDC C-700 (2002 Copyrighted Edition)

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SECTION 00700

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS AND TERMINOLOGY

Section 1.01 Defined Terms

- A. Wherever used in these General Conditions or in other Contract Documents, the terms listed below have the meanings indicated which are applicable to both the singular and plural thereof. Said terms are generally capitalized or written in italics, but not always. When used in a context consistent with the definition of a listed-defined term, the term shall have a meaning as defined below whether capitalized or italicized or otherwise.
1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*--The written instrument which is evidence of the agreement between City and Contractor covering the Work.
 3. *Application for Payment*--The form acceptable to the City which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *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 the United States Occupational Safety and Health Administration.
 5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*--The individual or entity who submits a Bid directly to CityCity.
 7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security, if any, and the Bid Form with any supplements.
 9. *Change Order*--A document recommended by Construction Manager which is signed by Contractor and City and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *City*--City of Manteca, San Joaquin County, California, including its agencies, departments or divisions whose conduct or action is related to the work.
 11. *Claim*--A demand or assertion by City or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 12. *Construction Manager*--The individual or entity retained by the City to perform construction quality assurance and contract administration functions not involving reviews and interpretations with respect to design intent. The Construction Manager is a representative of the City, either an employee or consultant, employed to act as advisor to the City in construction matters related to the Contract.
 13. *Contract*--The entire and integrated written agreement between the City and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

14. *Contract Documents*-- Those items so designated in the Agreement. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
15. *Contract Price*--The moneys payable by City to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
16. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Construction Manager's written recommendation of final payment.
17. *Contractor*--The individual or entity with whom City has entered into the Agreement.
18. *Cost of the Work*--See Paragraph 11.01.A for definition.
19. *Day*-- 24 consecutive hours running from midnight to midnight; calendar day.
 - a. *business day*: Day on the calendar except a Saturday and a holiday.
 - b. *working day*: Time measure unit for work progress. A working day is any 24-consecutive-hour period. CityCity
20. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows, on paper, the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
21. *Delay*--Event that extends the completion of an activity.
 - a. *excusable delay*: Delay caused by the Department and not reasonably foreseeable when the work began, such as:
 - 1) Change in the work
 - 2) Department action that is not part of the Contract
 - 3) Presence of an underground utility main not described in the Contract or in a location substantially different from that specified
 - 4) Described facility rearrangement not rearranged as described, by the utility City by the date specified, unless the rearrangement is solely for the Contractor's convenience
 - 5) Department's failure to obtain timely access to the right-of-way
 - 6) Department's failure to review a submittal or provide notification in the time specified
 - b. *critical delay*: Excusable delay that extends the scheduled completion date.
 - c. *concurrent delay*: Occurrence of at least 2 of the following events in the same period of time, either partially or entirely:
 - 1) Critical delay
 - 2) Delay to a controlling activity caused by the Contractor
 - 3) Non-working day
22. *Department*--Engineering Department, City of Manteca, and its authorized representatives.
23. *Detour*--Temporary route for traffic around a closed road part. A passageway through a job site is not a detour.
24. *Director*--the Director of the Engineering Department, City of Manteca.
25. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective,

but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

26. *Engineer*--The individual or entity named as such in the Agreement.
27. *Field Directive*--A written order issued by the Construction Manager which requires Work to be completed but liability is either unclear or in dispute. Contractor is required to track the actual cost of labor, materials, and equipment to perform the Work for future liability discussions.
28. *Force Account Work also known as Time and Material*--Work ordered on a construction project without an existing agreement on its cost, and performed with the understanding that the contractor will bill the City according to the cost of labor, materials, and equipment, plus a certain percentage for overhead and profit. (Refer to Section 12.01 of these General Conditions, and the California Department of Transportation Equipment Rental Rates and Labor Surcharge).
29. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
30. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.
31. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
32. *Holiday*--Holiday shown in the following table:

Holidays	
Holiday	Date observed
~~Every Sunday~~	~~Every Sunday~~
New Year's Day	January 1st
Birthday of Martin Luther King, Jr.	3rd Monday in January
Lincoln's Birthday	February 12th
Washington's Birthday	3rd Monday in February
Cesar Chavez Day	March 31st
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Columbus Day	2nd Monday in October
Veterans Day	November 11th
Thanksgiving Day	4th Thursday in November
Day after Thanksgiving Day	Day after Thanksgiving Day
Christmas Day	December 25th

Additionally, the City does not work on Fridays. Special accommodations must be made by the Contractor for City staff to be available for any work to occur on these Fridays.

33. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
34. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
35. *Material shortage*--
 - a. *Shortage of raw or produced material that is area-wide and caused by an unusual market*

condition except if any of the following occurs:

- 1) Shortage relates to a produced, nonstandard material
 - 2) Supplier's and the Contractor's priority for filling an order differs
 - 3) Event outside the United States for a material produced outside the United States
 - 4) Unavailability of water that delays a controlling activity
36. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
37. *Notice of Award*--The approval of the construction contract award by the Manteca City Council.CityCity
38. *Notice to Proceed*--A written notice given by City to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
39. *City*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
40. *PCBs*--Polychlorinated biphenyls.
41. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
42. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
43. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
44. ~~*Project Documents*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Documents, which may be bound in one or more volumes, is contained in the table(s) of contents.~~
45. *Quality Control Plan*--Contractor's plan to ensure QC.
46. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
47. *Related Entity*--An officer, director, partner, employee, agent, consultant, or subcontractor.
48. *Resident Project Representative*--The authorized representative of Construction Manager who may be assigned to the Site or any part thereof.
49. *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.
50. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
51. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
52. *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.

53. *Site*--Lands or areas indicated in the Contract Documents as being furnished by City upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by City which are designated for the use of Contractor.
54. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
55. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
56. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of the City, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be safely and conveniently utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
57. *Substantial Defects*--Defects plainly seen as damaged, displaced, or missing parts or improper functioning of materials, parts, equipment, or systems.
58. *Successful Bidder*--The Bidder submitting the lowest, responsive, and responsible Bid to whom City makes an award.
59. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.
60. *Supplier*--A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.
61. *Traffic*--Pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any street, roadway or sidewalk for purposes of travel.
62. *Traffic lane*--Portion of traveled way used for the movement of a single line of vehicles.
63. *Traveled way*--Portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.
64. *Unauthorized Work*: Work performed outside of the scope of the agreement or beyond the lines and grades described in the Contract or established by the Engineer or extra work performed without City authorization.
65. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
66. *Unit Price Work*--Work to be paid for on the basis of unit prices.
67. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

- ~~68. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by City and recommended by Construction Manager ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times. The signatory for the City may authorize a Work Change Directive for work on a Not to Exceed basis, where the Engineer's estimate for probable cost for said work is within the signatories authority and threshold in conformance of the City's purchasing policies.~~
69. *Withhold*--Money temporarily or permanently taken from a progress payment.
70. *Work*--Resources and activities required for Contract acceptance, including labor, materials, equipment, and the created product.
71. *Work Plan*--Detailed formulation of a program of action.
72. *Work Zone*--Area of a roadway or street with construction, maintenance, or utility work activities.

Section 1.02 Terminology

- A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.
- B. Intent of Certain Terms or Adjectives
1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer or Construction Manager. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer or Construction Manager as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer or Construction Manager any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.
- ~~C. *Day*~~
- ~~1. The word "day" means a calendar day of twenty four (24) hours measured from midnight to the next midnight.~~
- D. Defective
1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents, or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
 - c. has been damaged prior to --Construction Manager's recommendation of final payment (unless responsibility for the protection thereof has been assumed by City at Substantial Completion in

accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide, Supply

1. The word "Furnish" or the word "Install" or the word "Perform" or the word "Provide" or the word "Supply," or any combination or similar directive or usage thereof, shall mean FURNISHING AND INCORPORATING IN THE WORK including all necessary labor, materials, equipment, and everything necessary to perform the Work indicated, unless specifically limited in the context used.
2. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2. PRELIMINARY MATTERS

Section 2.01 Delivery of Bonds and Evidence of Insurance

- A. When Contractor delivers the executed counterparts of the Agreement to City, Contractor shall also deliver to City such bonds as Contractor may be required to furnish.
- B. Evidence of Insurance: Before any Work at the Site is started, Contractor and City shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and City respectively are required to purchase and maintain in accordance with Article 5.

Section 2.02 Copies of Documents

- A. City shall furnish to Contractor electronic PDF copies of the Drawings and Contract Documents.

Section 2.03 Commencement of Contract Times; Notice to Proceed

- A. The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract.

Section 2.04 Starting the Work

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

Section 2.05 Before Starting Construction

- A. Preliminary Schedules: Within ten (10) days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Construction Manager for timely review:
 1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

Section 2.06 Preconstruction Meeting

- A. Before any Work at the Site is started, a meeting attended by City, Contractor, Construction Manager, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

Section 2.07 Initial Acceptance of Schedules

- A. At least ten (10) days before submission of the first Application for Payment a conference attended by Contractor, Construction Manager, and others as appropriate will be held to review for acceptability to Construction Manager as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
- B. The Progress Schedule will be acceptable to City if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on City responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
- C. Contractor's Schedule of Submittals will be acceptable to Construction Manager and Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
- D. Contractor's Schedule of Values will be acceptable to Construction Manager as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work for each Bid Item as submitted on the Bid Sheet.

ARTICLE 3. CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Section 3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to City.
- C. Clarifications and interpretations with respect to the design intent of the Contract Documents shall be issued by Engineer through the Construction Manager, and clarifications and interpretations with respect to administrative matters shall be issued by the Construction Manager as provided in Article 9.
- D. The Specifications may vary in form, format and style. Some specification sections are written in varying degrees of streamlined or declarative style and some sections may be relatively narrative by comparison. Omissions of such words and phrases as "the Contractor shall," "in conformity with," "as shown," or "as specified" are intentional in streamlined sections. Omitted words and phrases shall be supplied by inference. Similar types of provisions may appear in various parts of a section or articles within a part depending on the format of the section. The Contractor shall not take advantage of any variation of form, format or style in making claims for extra Work.
- E. The cross referencing of specification sections under the subparagraph heading "Related Sections include but are not necessarily limited to:" and elsewhere within each specification section is provided as an aid and convenience to the Contractor. The Contractor shall not rely on the cross referencing provided and shall be responsible to coordinate the entire work under the Contract Documents and provide a complete Project whether or not the cross referencing is provided in each section or whether or not the cross

referencing is complete.

Section 3.02 Reference Standards

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of City, Contractor, Engineer or Construction Manager, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to City, Engineer or Construction Manager, or any of their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

Section 3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

1. Contractor's Review of Contract Documents Before Starting Work: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Construction Manager any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer through Construction Manager before proceeding with any Work affected thereby.
2. Contractor's Review of Contract Documents During Performance of Work: 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 Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Construction Manager in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

B. City Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, 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 standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any 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).

Section 3.04 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a field Directive or Change Order.

- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 - 1. A Field Order
 - 2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or
 - 3. Engineer's written interpretation or clarification of matters of design intent issued through the Construction Manager, and Construction Managers written interpretation or clarification of administrative matters.

Section 3.05 Reuse of Documents

- A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:
 - 1. have or acquire any title to or Cityship rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or
 - 2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of City and Engineer and specific written verification or adoption by Engineer.
- B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

Section 3.06 Electronic Data

- A. Copies of data furnished by City or Engineer to Contractor or Contractor to City or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

Section 4.01 Availability of Lands

- A. City shall furnish the Site. City shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. City will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and City are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in City's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in

Paragraph 10.05.

1. Where easement lines are shown on the Contract Drawings they shall be considered as shown in their final location unless stipulated otherwise in the Supplementary Conditions.
- B. Upon reasonable written request, City shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and City's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Section 4.02 Subsurface and Physical Conditions

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and
 2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against City or Engineer, or any of their Related Entities with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

Section 4.03 Differing Subsurface or Physical Conditions

- A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:
 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
 2. is of such a nature as to require a change in the Contract Documents; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify City and Construction Manager in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Construction Manager's and Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Construction Manager will promptly review the pertinent condition with Engineer as appropriate, determine the necessity of City's obtaining additional exploration or tests with respect thereto, and advise City in writing (with a copy to Contractor and Engineer) of Construction Manager's findings and conclusions.
- C. Possible Price and Times Adjustments:
1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to City with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
 3. If City and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, City, Engineer and Construction Manager, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

Section 4.04 Underground Facilities

- A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to City or Engineer by the City of such Underground Facilities, including City, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
1. City and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data,
 - b. contacting and coordinating with underground service alert (USA) and locating all Underground Facilities within the construction area
 - c. coordination of the Work with the City of such Underground Facilities, including City, during construction, and

- d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.
 3. Pursuant to Government Code Section 4216-4216.9, the Contractor shall notify the appropriate regional notification center of all excavations as required under Government Code sections 4216 to 4216.9. The Contractor shall contact Underground Service Alert at usanorth811.org for the location of subsurface installations. Contractor shall furnish to the Construction Manager written documentation of its contact(s) with Underground Service Alert within two (2) days after such contact(s).
 4. At least two (2) days before performing any excavation work, the Contractor shall request the utility Citys to mark or otherwise indicate the location of their service. Contractor shall furnish to the Construction Manager written documentation of its contact(s) with utility Citys requesting them to mark or otherwise indicate the location of their respective facilities within three (3) days after such contact(s).
 5. It shall be the Contractor's responsibility to determine the exact location and depth of all utilities, including service connections, which have been marked by the respective Citys and which Contractor believes may affect or be affected by Contractor's operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work.
- B. Not Shown or Indicated:
1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the City of such Underground Facility and give written notice to that City and to City and Construction Manager. Construction Manager will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
 2. If Construction Manager concludes that a change in the Contract Documents is required, a Field Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If City and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, City or Contractor may make a Claim therefor as provided in Paragraph 10.05. In accordance with Government Code Section 4215 the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay is caused by the failure of the City or utility company to provide for the removal or relocation of facilities for which they are the responsible party.
 3. When the General Requirements, Specifications, or Construction Drawings indicate that a utility is to be relocated, altered or constructed by others, the City will conduct all negotiations with the utility company and the work will be done at no cost to the Contractor.
 4. Temporary or permanent service, relocation or alteration of utilities desired by the Contractor for its own convenience shall be the Contractor's responsibility and it shall make arrangements and bear all costs.

5. Except where the City of a damaged utility has advised that it intends to repair the damage through its own forces or forces that it will retain or has retained, Contractor shall, within 24 hours of receipt from the City of notice to commence correction of damage, notify the Construction Manager in writing if Contractor intends to repair the damage. During nights and weekends when work is not in progress, City may give such notice by telephone or by facsimile transmission to the Contractor's facsimile number and such notice will be immediately effective. The Contractor's failure to provide timely written notification that it intends to repair the damage shall be deemed its agreement that the City may repair the damage at Contractor's expense without further notice and without prejudice to any other remedy available to City. In such event, the Contractor may observe the Work if this can be done without in any way delaying the progress thereof, but may not contest any element of the expense of repair or the lack of further notice. This provision is in addition to any other remedy, including the remedy provided in 13.09, City May Correct Defective Work.

Section 4.05 Reference Points

- A. City shall specify the nearest monument location to establish reference points for construction to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of City. Contractor shall report to Construction Manager whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by licensed land surveyor registered in the state of California.

Section 4.06 Hazardous Environmental Condition at Site

- A. *Reports and Drawings*: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against City or Engineer, or any of their Related Entities with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify City and

Construction Manager (and promptly thereafter confirm such notice in writing). City shall promptly consult with Construction Manager concerning the necessity for City to retain a qualified expert to evaluate such condition or take corrective action, if any.

1. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after City has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If City and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- E. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then City may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If City and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. City may have such deleted portion of the Work performed by City's own forces or others in accordance with Article 7.
- F. To the fullest extent permitted by Laws and Regulations, City shall indemnify and hold harmless Contractor, Subcontractors, Engineer and Construction Manager, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.F shall obligate City to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- G. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless City, Engineer and Construction Manager, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
 1. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5. BONDS AND INSURANCE

Section 5.01 Performance, Payment, and Other Bonds

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also

furnish such other bonds as are required by the Contract Documents.

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify City and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

Section 5.02 Licensed Sureties and Insurers

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by City or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

Section 5.03 Certificates of Insurance

- A. Contractor shall deliver to City, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by City or any other additional insured) which Contractor is required to purchase and maintain.
- B. City shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which City is required to purchase and maintain.

Section 5.04 Contractor's Liability Insurance

- A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible

property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the Cityship, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) City, Engineer and Construction Manager, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Contract Documents or required by Laws or Regulations, whichever is greater;
3. include completed operations insurance;
4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to City and Contractor and to each other additional insured identified in the Supplementary Conditions (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.
 - a. Contractor shall furnish City and each other additional insured identified in the Supplementary Conditions evidence satisfactory to City and any such additional insured of continuation of such insurance at final payment and one year thereafter.
8. With respect to all insurance required by this paragraph 5.04., Contractor agrees to waive all rights of subrogation against City, Engineer and Construction Manager, and each additional insured identified in the Supplemental Conditions.

Section 5.05 City's Liability Insurance

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, City, at City's option, may purchase and maintain at City's expense City's own liability insurance as will protect City against claims which may arise from operations under the Contract Documents.

Section 5.06 Property Insurance

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of City, Contractor, Subcontractors, Engineer and Construction Manager, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, collapse, explosion, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by City prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by City;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by City, Contractor, Engineer and Construction Manager with thirty (30) days written notice to each other additional insured.
- B. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of City, Contractor, Subcontractors, Engineer and Construction Manager, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty (30) days prior written notice has been given to City and Contractor and to each other additional insured and will contain waiver provisions in accordance with Paragraph 5.07.
- D. City shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, City shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, City shall in writing advise Contractor whether or not such other insurance has been procured by City.

Section 5.07 Waiver of Rights

- A. City and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect City, Contractor, Subcontractors, Engineer and Construction Manager, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional

insureds thereunder. City and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, Engineer and Construction Manager, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by City as trustee or otherwise payable under any policy so issued.

- B. City waives all rights against Contractor, Subcontractors, Engineer and Construction Manager, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to City's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by City; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by City during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by City covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, Engineer or Construction Manager, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

Section 5.08 Receipt and Application of Insurance Proceeds

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with City and made payable to City as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. City shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. City as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to City's exercise of this power. If such objection be made, City as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, City as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, City as fiduciary shall give bond for the proper performance of such duties.

Section 5.09 Acceptance of Bonds and Insurance; Option to Replace

- A. If either City or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. City and Contractor shall each provide to the other such additional information in

respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

Section 5.10 Partial Utilization, Acknowledgment of Property Insurer

- A. If City finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.
 - 1. All insurance required by the Contract Documents, or by laws or regulations shall remain in full force and effect on all phases of the Work, whether or not the Work is occupied or utilized by City, until all Work included in the agreement has been completed and final payment has been made.
 - 2. Nothing contained in the insurance requirements shall be construed as limiting the extent of Contractor's responsibility for payment of damages resulting from Contractor's, subcontractors' or suppliers' operations under the Contract. Contractor agrees that Contractor alone shall be completely responsible for procuring and maintaining full insurance coverage as provided herein or as may be otherwise required by the Contract Documents. Any approval by City or Construction Manager shall not operate to the contrary.

ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES

Section 6.01 Supervision and Superintendence

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of City or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. Means or methods of work suggested by the City, the Construction Manager, or the Engineer to the Contractor, but not specified or required, if adopted or followed by the Contractor in whole or in part, shall be used at the risk and responsibility of the Contractor. The City, Construction Manager, or the Engineer assume no responsibility therefor, and in no way will be held liable for any defects in the Work which may result from or be caused by use of such plan or method of Work.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to City and Construction Manager except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

Section 6.02 Labor; Working Hours

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good

discipline and order at the Site.

- B. In the absence of any Federal, state or local laws, regulations or covenants, the Contractor may conduct its performance of the Work at the Contractor's sole discretion, except that the cost of any overtime pay or other expense incurred by the City for Resident Project Representative, City's Representative and construction observation services, occasioned by the conduct of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day, shall be reimbursed to the City by the Contractor. Contractor shall provide to Construction Manager 72-hour written notice of intent to work outside of regular working hours.
- C. Prevailing Wage:
1. Pursuant to SB 854 and SB 96 and to provisions of the Labor Code Section 1770, et. seq., of the State of California, the Director of the Department of Industrial Relations has ascertained the prevailing rate of wages of the locality in which the Work is to be performed and applicable to the work to be done. Prevailing wage for each job category shall be as published by Department of Industrial Relations at the time of project work.
 2. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.
 3. No Contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5
 4. Contractor shall post job site notices prescribed by regulation.
 5. For each worker paid less than the stipulated rate in the execution of the Contract by the Contractor, or any subcontractor under it, in violation of the provisions of the Labor Code, and in particular, Section 1770 to Section 1780, inclusive, the Contractor shall be subject to the provisions and penalties of Section 1775 of the Labor Code. In addition to said penalty, and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amounts paid to each worker for each calendar day, or portion thereof, for which each worker was paid less than the stipulated prevailing rate shall be paid to each worker by the Contractor.
 6. The wage rates set forth are the minimum that may be paid by the Contractor. Nothing herein contained shall be construed as preventing the Contractor from paying more than the minimum set forth.
 7. No extra compensation whatever shall be allowed by the City due to the inability of the Contractor to hire labor at the minimum rate nor for any necessity for payment by the Contractor for subsistence, travel time, overtime, or other added compensation, all of which possibilities are elements to be considered and ascertained to the Contractor's own satisfaction in preparing the bid.
 8. If it becomes necessary to employ a craft other than those listed in the prevailing rates, the Contractor shall notify the City immediately and the City will obtain the additional prevailing rate from the Director of the Department of Industrial Relations and the rate thus determined shall be applicable as a minimum at the time of initial employment.
 9. The Contractor shall pay travel and subsistence payments to workers needed to execute the work as such travel and subsistence payments are defined in the applicable collective bargaining agreement filed with the Department of Industrial Relations pursuant to Labor Code Section 1773.8.
 10. City and Contractor stipulate that Labor Code Section 1775 will be complied with.
 11. The City will consider the type of work performed by classification traditionally employed to perform said work in San Joaquin County when determining appropriate craft, classification or type of worker under Section 1733.2 of the California Labor Code.
 12. Not Used.

13. Certified Payrolls - In accordance with Section 1776 of the Labor Code, each Contractor and subcontractor shall keep an accurate payroll record, 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 the Contractor or the subcontractor in connection with the project. Pursuant to SB 854 and SB 96, All Contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).
14. The payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:
 - a. A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or its authorized representative on request.
 - b. A certified copy of all payroll records shall be made available for inspection or furnished upon request to a representative of the City, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
 - c. A certified copy of all payroll records shall be made available upon request by the public in accordance with Section 1776 of the Labor Code.
15. The Contractor is responsible for its and its subcontractors' compliance with the provisions of Section 1776 of the Labor Code.
16. Overtime Requirements - The Contractor shall forfeit, as a penalty to the City, the penalty as provided in Section 1813 of the Labor Code for each worker employed in the execution of the Contract by the Contractor, or any subcontractor under the Contractor, for each day during which such worker is required or permitted to work more than eight (8) hours in any one day and forty (40) hours in any one week, in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815 thereof, inclusive, except that work performed by employees of Contractors in excess of eight (8) hours a day and forty (40) hours during one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day, at not less than one and a half (1.5) times the basic rate of pay as provided for in Section 1815 of the Labor Code.
17. Apprentice and Trainee - Attention is directed to the provisions in Section 1777.5 of the Labor Code and in accordance with the regulations of the California Apprenticeship Council concerning the employment of apprentices by the Contractor or any subcontractor under the Contractor.
18. Section 1777.5 requires the Contractor or subcontractors employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of the project that administers the apprenticeship program in that trade for a certificate of approval. The Contractor and subcontractors are required to submit contract award information to the applicable joint apprenticeship committee. As provided for in Section 1777.5 of the Labor Code, the Contractor is required to make contributions to funds established for the administration of apprenticeship programs.
19. It shall be the responsibility of the Contractor to abide by the provisions of Section 1777.5 of the Labor Code and to require all subcontractors employed by or contracting with the Contractor to abide by said provisions. The Contractor shall furnish the City any and all evidence of compliance with this code section when requested by the City.
20. For failure to comply with Section 1777.5 of the Labor Code, the Contractor shall be subject to the penalties in Section 1777.7 of the Labor Code. The provisions of this paragraph apply only to the extent not preempted by Federal law.
21. Workers' Compensation Insurance - The Contractor is required to secure the payment of compensation to its employees in accordance with the provisions of Sections 1860 and 3700 of the

Labor Code and Paragraph 00820-2.40, Workers' Compensation Insurance.

Section 6.03 Services, Materials, and Equipment

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
 - 1. Where the Work requires equipment be furnished, due to the lack of standardization of equipment as produced by the various manufacturers, it may become necessary to make minor modifications in the structures, buildings, piping, mechanical work, electrical work, accessories, controls, or other work, to accommodate the particular equipment offered. Contractor's bid price for any equipment offered shall include the cost of making any necessary changes subject to the approval of Construction Manager.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of City. If required by Engineer or Construction Manager, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.
 - 1. Materials and equipment, if furnished by the City, will be made available as designated in the General Requirements. The cost of unloading, hauling and handling, and placing City-furnished materials and equipment shall be considered as included in the price bid for the Contract item involving such City-furnished material.
 - 2. Contractor shall inspect and assure itself of the amount and soundness of such materials and equipment.
 - 3. The Contractor will be held responsible for all materials and equipment furnished to it and received by it, and shall pay all demurrage and storage charges. City-furnished materials and equipment lost or damaged from any cause whatsoever shall be replaced by the Contractor. The Contractor will be liable to the City for the cost of replacing City-furnished material and equipment and such costs may be deducted from any moneys due or to become due the Contractor.
- D. All items of standard equipment shall be the latest model at the time of bid, unless otherwise specified.

Section 6.04 Progress Schedule

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Construction Manager for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

Section 6.05 Substitutes and "Or-Equals"

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

- i) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
- ii) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; it has a proven record of performance and availability of responsive service; and

Contractor certifies that, if approved and incorporated into the Work:

- iii) there will be no increase in cost to the City or increase in Contract Times, and
- iv) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

- a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Construction Manager from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Construction Manager for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - i) shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified;
 - ii) will state:

- 1) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;
 - 2) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with City for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
- iii) will identify:
- 1) all variations of the proposed substitute item from that specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
- iv) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. **Substitute Construction Methods or Procedures:** If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* City may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse City for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse City for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with City) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

Section 6.06 Concerning Subcontractors, Suppliers, and Others

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to City as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom City may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to City in advance for acceptance by City by a specified date prior

to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, City's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by City of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of City or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to City, Engineer, and Construction Manager for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between City, Engineer or Construction Manager and any such Subcontractor, Supplier or other individual or entity, nor
 - 2. shall create any obligation on the part of City or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Construction Manager and Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of City, Construction Manager and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against City, Contractor, Construction Manager and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

Section 6.07 Patent Fees and Royalties

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of City or Engineer its use is subject to patent rights or copyrights calling

for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by City in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless City, Construction Manager and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

Section 6.08 Permits

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. City shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. City shall pay all charges of utility Citys for connections for providing permanent service to the Work.

Section 6.09 Laws and Regulations

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither City, Construction Manager nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If City and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

Section 6.10 Taxes

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

Section 6.11 Use of Site and Other Areas

- A. Limitation on Use of Site and Other Areas
 - 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the City or occupant thereof, or of any adjacent land or areas resulting from the performance of the

Work.

2. Should any claim be made by any such City or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless City, Construction Manager and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such City or occupant against City, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by City. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

Section 6.12 Record Documents

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Field Directives, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Construction Manager for reference, and shall be current at the time of Contractor's submission of Application for Payment as a condition precedent for Construction Manager's recommendation of payment. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Construction Manager for City. Contractor shall include accurate locations for buried and imbedded items.

Section 6.13 Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and

maintain all necessary safeguards for such safety and protection. Contractor shall notify City of adjacent property and of Underground Facilities and other utility Citys when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

1. At least three (3) business days before performing any excavation work or other work that could damage existing improvements within, or adjacent to, the Work area, the Contractor shall notify the City of properties adjacent to the Work area of intended commencement of such Work and request that such City mark or otherwise indicate the location of underground improvements of which they are aware or other improvements not readily apparent from visual inspection of the adjacent property, such as survey points and utility service installations not owned by the appropriate utility. The Contractor shall also give three (3) business days notice to occupants or City of adjacent property to permit them to salvage or relocate plants, trees, fences, sprinklers, and other improvements within the right-of-way that are designated for removal or would be destroyed because of the Work. Contractor shall furnish to the Construction Manager written documentation of its contact(s) with property City (1) requesting them to mark or otherwise indicate the location of their respective facilities, and (2) notifying them to salvage or relocate landscaping or improvements within or adjacent to the Work area within two (2) days after such contact(s).
 2. It shall be the Contractor's responsibility to determine the exact location (including depth for underground improvements) and to document the existing condition of all existing improvements which are not designated for removal (e.g., curbs, sidewalks, survey points, fences, walls, signs, utility installations, pavements, structures, etc.) which the Contractor believes may affect or be affected by Contractor's operations.
 3. In the event that existing improvements are found that have not been identified in the Contract Documents or indicated by the respective property City, or are found to exist in a substantially different location than so indicated, the Contractor shall (1) immediately notify the Construction Manager thereof in writing, and (2) take steps to avoid damaging such improvements, including ascertaining their exact location if not yet known.
- C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of City, Construction Manager or Engineer, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
1. The Contractor shall immediately notify the Construction Manager and the property City of any damage to any existing improvements that have not been designated to be removed. The Contractor shall be responsible for the cost of repairing or restoring all existing improvements which are not designated for removal (e.g., curbs, sidewalks, survey points, fences, walls, signs, utility installations, pavements, structures, etc.) and are damaged or removed as a result of its operations. Repairs and replacements shall be at least equal to existing improvements and shall match them in finish and dimension.
 2. The Contractor shall protect from damage all landscaping (e.g., trees, lawns, shrubbery, etc.) adjacent to the Work area or within the Work area that have not been designated to be removed. The Contractor shall immediately notify the Construction Manager and the property City of any damage to any such landscaping which is not designated for removal. The Contractor shall be responsible for the cost of restoring or replacing such landscaping in as nearly the original conditions and location as it is reasonably possible. Lawns shall be re-seeded and covered with suitable mulch.

3. Except where an City of damaged improvements or landscaping has advised that he or she intends to repair the damage himself or through forces that he or she will retain or has retained, Contractor shall, within 24 hours of receipt from the City of notice to commence correction of damage, notify the Construction Manager in writing if Contractor intends to repair the damage. During nights and weekends when work is not in progress, City may give such notice by telephone or by facsimile transmission to the Contractor's facsimile number designated and such notice will be immediately effective. The Contractor's failure to provide timely written notification that it intends to repair the damage shall be deemed its agreement that the City may repair the damage at Contractor's expense without further notice and without prejudice to any other remedy available to City. In such event, the Contractor may observe the Work if this can be done without in any way delaying the progress thereof, but may not contest any element of the expense of repair or the lack of further notice. This provision is in addition to any other remedy, including the remedy provided in 13.09, City May Correct Defective Work.
- D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Construction Manager has issued a notice to City and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- E. The Contractor shall establish, implement, and maintain a Written injury prevention program as required by Labor Code Section 6401.7. This written program shall be submitted to the Construction Manager within five (5) days of Notice to Proceed. The Contractor's injury prevention program will not be reviewed for approval. Before proceeding with any construction work, the Contractor shall take the necessary action to comply with all provisions for safety and accident prevention. The Contractor shall develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The Contractor shall appoint an employee as safety supervisor who is qualified and authorized to supervise and enforce compliance with the safety program. The Contractor, as a part of its safety program, shall maintain at its office or other well-known place at the Site, safety equipment applicable to the Work as prescribed by the aforementioned authorities, all items necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the jobsite.
 1. In accordance with the provisions of Section 6705 of the Labor Code, the Contractor shall submit, in advance of excavation 5 feet or more in depth, detailed plans showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from hazard of caving ground during such excavation. If such plans vary from the shoring system standards set forth in the Construction Safety Orders in Title 8, California Code of Regulations, the plans shall be prepared and signed by a registered civil or structural engineer. Shoring, bracing, sloping, or other protective system shall not be less effective than required by the California Construction Safety orders. The Contractor shall designate in writing to the Construction Manager the "competent person" with the authority and responsibilities designated in the Construction Safety Orders.
 2. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Construction Manager and the City. In addition, the Contractor must promptly report in writing to the Construction Manager all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the Site, giving full details and statements of witnesses. The Contractor shall make all reports as are, or may be, required by any authority having jurisdiction, and permit all safety inspections of the work being performed under this Contract.
 3. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Construction Manager, giving full details of the claim.

Section 6.14 Safety Representative

- A. 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.

Section 6.15 Hazard Communication Programs

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

Section 6.16 Emergencies

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Construction Manager prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Field Directive or Change Order will be issued.
- B. If Contractor fails to take appropriate action in an emergency, the City also reserves the right to perform any portion of the work that threatens the safety or health of the public or City, and the safety of the work or any property or equipment. In the event the City performs work in an emergency, an appropriate Change Order shall be issued unilaterally deducting from the payments then or thereafter due the Contractor the cost for performing such Work, including compensation for the Engineer's, the Construction Manager's, and City's additional services made necessary by such emergency.

Section 6.17 Shop Drawings and Samples

- A. Contractor shall submit required Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.
 - 1. Shop Drawings:
 - a. Submit number of copies specified in the General Requirements.
 - i) Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
 - ii) Shop Drawings submitted as herein provided by Contractor and reviewed by Engineer for conformance with the design concept shall be executed in conformity with the Contract Documents unless otherwise required by City.
 - iii) When Shop Drawings are submitted for the purpose of showing the installation in greater detail, their review shall not excuse Contractor from requirements shown on the drawings and Specifications.
 - iv) For-Information-Only submittals upon which the Engineer is not expected to conduct review or take responsive action may be so identified in the Contract Documents.
 - 2. *Samples*: Contractor shall also submit required Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.
 - a. Submit number of Samples specified in the Specifications.
 - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the

use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Submittal Procedures:*
1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
 - a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;
 - c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and
 - d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation; otherwise Contractor will not be relieved of the responsibility of executing the Work in accordance with the Contract Documents, even though such Shop Drawings or Samples have been otherwise reviewed.
 - a. If a Shop Drawing or Sample, as submitted, indicates a variation from the Contract Requirements as set forth in the Contract Documents and Engineer finds same to be in the interest of City and to be so minor as not to involve a change in the Contract Price or time for performance, Engineer may approve the Shop Drawings or Samples; provided however, such departure is slight in nature and does not affect the design concept of the Work.
 4. Contractor shall submit all Shop Drawings and Samples sufficiently in advance of construction requirements to allow ample time for checking, correcting, resubmitting and rechecking and to avoid any delay in progress of the Work.
 5. Shop Drawings and Sample submittals not conforming to requirements of this paragraph 6.17D and Section 01340 will be returned to Contractor without action for resubmittal and the resulting delay shall be entirely the responsibility of Contractor.
- D. *Engineer's Review*
1. Engineer will provide timely review of required Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine 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 a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or

procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) 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.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.
4. Engineer's check and review of Shop Drawings and Samples, Standard Specifications and descriptive literature submitted by Contractor will be only for general conformance with design concept, except as otherwise provided, and shall not be construed as:
 - a. permitting any departure from the Contract Requirements;
 - b. relieving Contractor of the responsibility for any error in details, dimensions or otherwise that may exist in such submittals;
 - c. constituting a blanket approval of dimensions, quantities, or details of the material or equipment shown; or
 - d. approving departures from additional details or instructions previously furnished by Engineer. Such check or review shall not relieve Contractor of the full responsibility of meeting all of the requirements of the Contract Documents.

E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

Section 6.18 Continuing the Work

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with City. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as City and Contractor may otherwise agree in writing.

Section 6.19 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to City that all Work will be in accordance with the Contract Documents and will not be defective. Construction Manager and Engineer, and their Related Entities, shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Construction Manager and Engineer;
2. recommendation by Construction Manager or payment by City of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by Construction Manager or any payment related thereto by City;
4. use or occupancy of the Work or any part thereof by City;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by the Construction Manager, Engineer or others; or
7. any correction of defective Work by City.

Section 6.20 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless City, Construction Manager and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against City or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Construction Manager and Engineer and their respective officers, directors, partners, employees, agents, consultants and subcontractors arising out of:
 1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

Section 6.21 Delegation of Professional Design Services

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the permanent Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to permanent systems, materials or equipment incorporated into the Work are specifically required of Contractor by the Contract Documents, City and Engineer will specify all performance and design criteria that such services must

satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. City and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided City and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

Section 6.22 Waste Disposal Services

- A. Contractor shall use City garbage services for the disposal of construction waste. Contractor shall recycle waste as appropriate. Contractor shall provide a monthly update to the City of the quantity of waste recycled and general waste.

ARTICLE 7. OTHER WORK AT THE SITE

Section 7.01 Related Work at Site

- A. City may perform other work related to the Project at the Site with City's employees, or via other direct contracts therefor, or have other work performed by utility Cities. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if City and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility City and City, if City is performing other work with City's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Construction Manager and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility Cities and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between City and such utility Cities and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Construction Manager in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent

defects and deficiencies in such other work.

Section 7.02 Coordination

- A. If City intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, City shall have sole authority and responsibility for such coordination.

Section 7.03 Legal Relationships

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of City.
- B. Each other direct contract of City under Paragraph 7.01.A shall provide that the other contractor is liable to City and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.
- C. Contractor shall be liable to City and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8. CITY'S RESPONSIBILITIES

Section 8.01 Communications to Contractor

- A. Except as otherwise provided in these General Conditions, City shall issue all communications to Contractor through Construction Manager.

Section 8.02 Replacement of Construction Manager or Engineer

- A. In case of termination of the employment of either Construction Manager or Engineer, City shall appoint a Construction Manager or engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Construction Manager or Engineer.

Section 8.03 Furnish Data

- A. City shall promptly furnish the data required of City under the Contract Documents.

Section 8.04 Pay When Due

- A. City shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

Section 8.05 Lands and Easements; Reports and Tests

- A. City's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to City's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

Section 8.06 Insurance

- A. City's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

Section 8.07 Change Orders

- A. City is obligated to execute Change Orders as indicated in Paragraph 10.03.

Section 8.08 Inspections, Tests, and Approvals

- A. City's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

Section 8.09 Limitations on City's Responsibilities

- A. The City shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. City will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

Section 8.10 Undisclosed Hazardous Environmental Condition

- A. City's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

Section 8.11 Evidence of Financial Arrangements

- A. If and to the extent City has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy City's obligations under the Contract Documents, City's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9. CONSTRUCTION MANAGER'S AND ENGINEER'S STATUS DURING CONSTRUCTION

Section 9.01 City's Representative

- A. Construction Manager and Engineer will be City's representatives during the construction period. The duties and responsibilities and the limitations of authority of Construction Manager and Engineer as City's representatives during construction are set forth in the Contract Documents and will not be changed without written consent of City, Construction Manager and Engineer.

Section 9.02 Visits to Site

- A. Engineer may make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of City, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for City a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will endeavor to guard City against defective Work.
- B. Construction Manager will make visits to the Site at intervals appropriate to the various stages of construction as Construction Manager deems necessary in order to observe the progress that has been made and

the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Construction Manager, for the benefit of City, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Construction Manager will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Construction Manager's efforts will be directed toward providing for City a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Construction Manager will keep City informed of the progress of the Work, and will endeavor to guard City against defective Work.

- C. Engineer's and Construction Manager's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

Section 9.03 Construction Manager's Project Representative

- A. If City and Construction Manager agree, Construction Manager will furnish a Resident Project Representative to assist Construction Manager in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If City designates another representative or agent to represent City at the Site who is not Construction Manager's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.
- B. Construction Manager's Resident Project Representative shall not authorize any deviation from the Contract Documents or substitutions of materials or equipment.

Section 9.04 Authorized Variations in Work

- A. Construction Manager or Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on City and also on Contractor, who shall perform the Work involved promptly. If City or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

Section 9.05 Rejecting Defective Work

- A. Construction Manager will have authority to reject Work which Construction Manager or Engineer believes to be defective, or that Construction Manager or Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Construction Manager will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.
- B. The acceptance at any time of materials or equipment by or on behalf of City shall not be a bar to future rejection if they are subsequently found to be defective, inferior in quality, or not equal to the material or equipment specified, or are not as represented to Construction Manager, Engineer or City.

Section 9.06 Shop Drawings, Change Orders and Payments

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Construction Manager's authority as to Applications for Payment, see Article 14.

Section 9.07 Determinations for Unit Price Work

- A. Construction Manager will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Construction Manager will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Construction Manager's written decision thereon will be final and binding (except as modified by Construction Manager to reflect changed factual conditions or more accurate data) upon City and Contractor, subject to the provisions of Paragraph 10.05.

Section 9.08 Decisions on Requirements of Contract Documents and Acceptability of Work

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents with respect to matters of design intent. Construction Manager will be the initial interpreter of the requirements of the Contract Documents with respect to administrative matters and judge of the acceptability of the Work thereunder. All matters in question and other matters between City and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Construction Manager in writing within 30 days of the event giving rise to the question.
- B. Construction Manager or Engineer through Construction Manager will, with reasonable promptness, render a written decision on the issue referred. If City or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Construction Manager's or Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Construction Manager's or Engineer's written decision on the issue referred will be final and binding on City and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Construction Manager and Engineer will not show partiality to City or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

Section 9.09 Limitations on Construction Manager's and Engineer's Authority and Responsibilities

- A. Neither Construction Manager's and Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Construction Manager or Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Construction Manager or Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Construction Manager or Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Construction Manager and Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Construction Manager and Engineer will not

be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

- C. Construction Manager and Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Construction Manager's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10. CHANGES IN THE WORK; CLAIMS

Section 10.01 Authorized Changes in the Work

- A. Without invalidating the Contract and without notice to any surety, City may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order or a Field Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
 - 1. *Potential Change Order:*
 - a. When City requests Contractor to present a proposal to accomplish a change in the Work, the request will be made in the form of a Potential Change Order (PCO) prepared by Construction Manager. The PCOPCO will describe the change and request Contractor to propose a cost and Contract Price and/or Contract Time change. Contractor will propose cost and/or time changes, if any, and shall provide an itemized breakdown of the cost of the change. Construction Manager will make recommendations to City concerning acceptance. If the PCO is approved by City, the PCO will be grouped into a future Change Order.
 - b. When the Contractor desires to propose changes to the Work, it may initiate a PCO in the same form as provided in Paragraph 10.01A.1.a. and submit the PCO to the Construction Manager for the Engineer's review and recommendation.
 - 2. *Field Directive:*
 - a. The City may issue a field directive as an order to perform additional work that is deemed necessary if the City and Contractor cannot agree upon a cost or schedule for proposed additional work or when they agree that delays could cause damage such that work must proceed immediately. Field directives are valid if signed by a signatory approved by City. The City's signatory may authorize a field directive for work on a Not-to-Exceed basis, where the Engineer's estimate for probable cost for said work is within the signatory's authority and threshold in conformance of the City's purchasing policies. Upon issuance of a validField Directive, Contractor shall proceed with work. Afield directive shall be followed by a valid change order for an agreed upon or force account adjustment to Contract payment or schedule for the additional work, as provided in Section 12.01.
 - 3. *Force Account:*
 - a. Work paid for by force account may be authorized by City under a valid field directive. For work paid by force account, the Construction Manager compares the City's records to Contractor's daily force-account work report. When the Contractor and the City agree on the contents of the daily

force-account work reports, the City accepts the report and the City pays for the work. If the records differ, the City pays for the work based only on the information shown on the City's records. If a subcontractor performs work at force account, the markups specified for labor, materials, and equipment include compensation for all delay costs, overhead costs, and profit. If an item's unit price is adjusted for work-character changes, the City excludes Contractor's cost of determining the adjustment. Payment for City-operated labor and equipment is made at the market-priced invoice submitted.

- B. If the City chooses to pay for change order work based on an agreed price, but Contractor and the City cannot agree on the price, the City may choose to pay by force account. If a portion of extra work is covered by bid items, the City pays for this work as changed quantities in those items. The City pays for the remaining portion of the extra work by force account or agreed price.
- C. Not Used.
- D. If City and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Field Directive, a Claim may be made therefor as provided in Paragraph 10.05.

Section 10.02 Unauthorized Changes in the Work

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

Section 10.03 Execution of Change Orders

- A. It is at the sole discretion of the City Council, or a delegate explicitly authorized by City Council, to execute Change Orders. The City and the Construction Manager will review all change orders, and, if the changes are deemed reasonable and appropriate by the City, the City will proceed to execute the appropriate change orders accordingly. Change orders recommended by the Construction Manager to the City shall consist of:
 - 1. changes in the Work which are: (i) ordered by City pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or City's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Field Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Construction Manager or by Engineer through Construction Manager pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

Section 10.04 Notification to Surety

- A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

Section 10.05 Claims

- A. *Construction Manager's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Construction Manager for decision. A decision by Construction Manager shall be required as a condition precedent to any exercise by City or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Construction Manager and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Construction Manager and the other party to the Contract within 60 days after the start of such event (unless Construction Manager allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Construction Manager and the claimant within thirty (30) days after receipt of the claimant's last submittal (unless Construction Manager allows additional time).
- C. *Construction Manager's Action:* Construction Manager will review each Claim and, within thirty (30) days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 - 1. deny the Claim in whole or in part,
 - 2. recommend approval of the Claim to the City, or
 - 3. notify the parties that the Construction Manager is unable to resolve the Claim if, in the Construction Manager's sole discretion, it would be inappropriate for the Construction Manager to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Construction Manager does not take action on a Claim within said thirty (30) days, the Claim shall be deemed denied.
- E. Construction Manager's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon City and Contractor, unless City or Contractor invoke the dispute resolution procedure set forth in Article 16 within thirty (30) days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11. COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

Section 11.01 Cost of the Work

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work, or the reasonable cost that would have been incurred in the case of deleted Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by City, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by City and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, training, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above. For Change Order pricing, the Labor Surcharge (social security contributions, unemployment excise, and payroll taxes) shall be twenty-seven (27) percent of the sum of the wages, vacation, and fringe benefits (workers' compensation, training, health and retirement benefits, sick leave, bonuses, and holiday pay).
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless City deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to City. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to City, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by City, Contractor shall obtain competitive bids from subcontractors acceptable to City and Contractor and shall deliver such bids to City, who will then determine, with the advice of Construction Manager, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by City with the advice of Construction Manager, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by

insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of City. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain. For Change Order pricing, bonds and insurance shall be 1 percent of the Change Order value for both additive and credit changes that are above the original Contract value and 0 percent of the Change Order value for both additive and credit changes that are below the original Contract value.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Construction Manager an itemized cost breakdown together with supporting data.

Section 11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or

entities as may be acceptable to City and Construction Manager.

- B. Not Used.
- C. Contingency Allowance
 - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of City to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Construction Manager to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

Section 11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Construction Manager subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item. Work described in the Contract Documents, or reasonably inferred as required for a functionally complete installation, but not identified in the listing of unit price items shall be considered incidental to unit price work listed and the cost of incidental work included as a part of the unit price.
- D. City or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the total cost of a particular item of Unit Price Work amounts to ten percent (10%) or more of the Contract Price at time of Notice of Award and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than twenty-five percent (25%) from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or City believes that City is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12. CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

Section 12.01 Change of Contract Price

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Construction Manager and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by applica-

tion of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum including overhead and profit not necessarily in accordance with Paragraph 12.01.C.2, and shall include the cost of any secondary impacts that are foreseeable at the time of pricing the cost of extra Work; or
3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (either by estimate before the work is performed or force account) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. Contractor's Fee: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be fifteen percent (15%);
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent (5%);
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of fifteen percent (15%) of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent (5%) of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to City for any change which results in a net decrease in cost will be the amount of the reasonable cost that would have been incurred to perform the Work plus a deduction in Contractor's fee by an amount equal to five percent (5%) of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.
 - g. costs and mark up percentages for force account work shall conform to this Agreement, including the articles of these general conditions.

Section 12.02 Change of Contract Times

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Construction Manager and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.
- C. No extension of the Contract Time will be allowed for additional Work or for claimed delay unless the additional Work contemplated or claimed delay is shown to be on the critical path of the Project's schedule of construction or Contractor can show by Critical Path Method analysis how the additional Work or claimed delay adversely affects the critical path.

Section 12.03 Delays

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A, without additional increase in the project costs. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by City, acts or neglect of utility Cities or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If City, Construction Manager, Engineer, or other contractors or utility performing other work for City as contemplated by Article 7, or anyone for whom City is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility not under the control of City, or other causes not the fault of and beyond control of City and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be in accordance with Paragraph 12.02 C, and shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. City, Construction Manager, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor, or for concurrent delays. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Section 13.01 Notice of Defects

- A. Prompt notice of all defective Work of which City or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

Section 13.02 Access to Work

- A. City, Construction Manager, Engineer, their consultants and other representatives and personnel of City, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

Section 13.03 Tests and Inspections

- A. Contractor shall give Construction Manager timely notice of readiness of the Work in accordance with the Contract Documents for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. City shall employ and pay for the first testing services for Quality Assurance inspections, tests, or

approvals on behalf of the City as specified under the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and
 3. as otherwise specifically provided in the Contract Documents.
- C. Where the contractor fails to meet quality assurance requirements, and additional inspection, testing or approvals are necessary to provide the required quality assurance as specified in the Contract Documents, the contractor shall bear the cost for said additional inspection, testing or approvals.
- D. If 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, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- E. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for City's and Construction Manager's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to City and Construction Manager.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Construction Manager, it must, if requested by Construction Manager, be uncovered for observation.
- G. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Construction Manager timely notice of Contractor's intention to cover the same and Construction Manager has not acted with reasonable promptness in response to such notice.

Section 13.04 Uncovering Work

- A. If any Work is covered prior to the specified inspection, testing or approvals required in the Contract Documents or contrary to the written request of Construction Manager, it must, if requested by Construction Manager, be uncovered for Construction Manager's observation and replaced at Contractor's expense.
- B. If Construction Manager considers it necessary or advisable that covered Work be observed by Construction Manager or inspected or tested by others, Contractor, at Construction Manager's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Construction Manager may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); or City shall be entitled to accept defective Work in accordance paragraph 13.08 in which case Contractor shall still be responsible for all costs associated with exposing, observing, and testing the defective Work. If the parties are unable to agree as to the amount thereof, City may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work, which had previously been inspected, tested or approved by the as specified and

was deemed by the Engineer and Construction Manager to conform with the requirements set forth in the Contract Documents, is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

Section 13.05 City May Stop the Work

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, City may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of City to stop the Work shall not give rise to any duty on the part of City to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

Section 13.06 Correction or Removal of Defective Work

- A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Construction Manager or Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair City's special warranty and guarantee, if any, on said Work.

Section 13.07 Correction Period

- A. If within one year after the date of Notice of Completion of the Work by City (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by City or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to City and in accordance with City's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by City, remove it from the Project and replace it with Work that is not defective,
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom, and
 - 5. Contractor shall provide a Warranty Form to the City with all appropriate Contractor contact information for the City's Staff to contact the Contractor in relation to warranty items.
- B. If Contractor does not promptly comply with the terms of City's written instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of

work of others) will be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

Section 13.08 Acceptance of Defective Work

- A. If (prior to Construction Manager's recommendation of final payment), instead of requiring correction or removal and replacement of defective Work, City prefers to accept it, City may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to City's evaluation of and determination to accept such defective Work (such costs to be approved by Construction Manager as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Construction Manager's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and City shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, City may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to City.

Section 13.09 City May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Construction Manager to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, City may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, City shall proceed expeditiously. In connection with such corrective or remedial action, City may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which City has paid Contractor but which are stored elsewhere. Contractor shall allow City, City's representatives, agents and employees, City's other contractors, Construction Manager and Engineer and Engineer's consultants access to the Site to enable City to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by City in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and City shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, City may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but

not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by City of City's rights and remedies under this Paragraph 13.09.

ARTICLE 14. PAYMENTS TO CONTRACTOR AND COMPLETION

Section 14.01 Schedule of Values

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Construction Manager. Progress payments on account of Unit Price Work will be based on the number of units completed.

Section 14.02 Progress Payments

A. Applications for Payments

1. At least twenty (20) days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Construction Manager for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that City has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect City's interest therein, all of which must be satisfactory to City.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. *Retention* - The City will deduct from each progress payment and retain as part security, five percent (5%) of the amount earned until the final payment.
4. Pursuant to Public Contract Code Section 22300, for moneys earned by the Contractor and withheld by the City to ensure the performance of the Contract.CityCity
5. Not Used.
6. Not Used.
7. Materials, as used herein, shall be considered to be those items that are fabricated and manufactured goods and equipment. Only those materials for which the Contractor can demonstrate are properly stored and secured in conformance with the Contract documents, and can transfer clear title to the City will be qualified for partial payment. The Contractor may request payment of seventy-five percent (75%) of the actual net cost of these materials, not to exceed fifty percent (50%) of the total line item extension as found in the bid schedule.
8. To receive partial payment for materials and equipment delivered to the Site, but not incorporated in the Work, it shall be necessary for the Contractor to submit to the Construction Manager a list of such materials, at least seven (7) business days prior to submitting the monthly estimate of amount earned for work completed. At the Construction Manager's sole discretion, the Construction Manager will

approve items for which partial payment is to be made subject to the following:

- a. Only equipment or materials that have received favorable review of shop drawings will qualify.
 - b. Eligible equipment or materials must be delivered and properly stored, protected, and maintained in a manner favorably reviewed by the Construction Manager, at the job site or at a bonded warehouse.
 - c. The Contractor's actual net cost for the materials must be supported by invoices of suppliers, or other documentation requested by the Construction Manager.
 - d. Materials or equipment delivered to the Site less than thirty (30) days prior to their scheduled incorporation in the Work shall not qualify.
 - e. Final payment shall be made only for materials actually incorporated in the Work. Upon acceptance of the Work, all materials remaining for which advance payments had been made shall revert to the Contractor, unless otherwise agreed, and partial payments made for these items shall be deducted from the final payment for the Work.
 - f. Partial payments for materials and equipment on hand shall not be deemed to be final payment for the material nor relieve the Contractor of its obligations under the Contract.
 - g. Partial payments for materials and equipment on hand shall be subject to retention in accordance with the Contract Documents.
9. After receipt of the last progress payment, but prior to acceptance of the Work by the City, the Contractor shall send a letter to the Construction Manager. The letter, pursuant to California Public Contract Code Section 7100, shall state that acceptance of the final payment described below shall operate as and shall be, a release to the City, the Construction Manager, the Designer, and their duly authorized agents, from all claim of and/or liability to the Contractor arising by virtue of the Contract related to those amounts. Disputed Contract claims in stated amounts previously filed as provided in Paragraph 00700-7.03b, Claims, may be specifically excluded by the Contractor from the operation of the release.

B. Review of Applications

1. Construction Manager will, within ten (10) business days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to City or return the Application to Contractor indicating in writing City's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Construction Manager's recommendation of any payment requested in an Application for Payment will constitute a representation by Construction Manager to City, based on Construction Manager's observations on the Site of the executed Work as an experienced and qualified design professional and on Construction Manager's review of the Application for Payment and the accompanying data and schedules, that to the best of Construction Manager's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Construction Manager's responsibility to observe the Work.
3. By recommending any such payment Construction Manager will not thereby be deemed to have

represented that:

- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Construction Manager in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by City or entitle City to withhold payment to Contractor.
4. Neither Construction Manager's review of Contractor's Work for the purposes of recommending payments nor Construction Manager's recommendation of any payment, including final payment, will impose responsibility on Construction Manager:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to City free and clear of any Liens.
5. Construction Manager may refuse to recommend the whole or any part of any payment if, in Construction Manager's opinion, it would be incorrect to make the representations to City stated in Paragraph 14.02.B.2. Construction Manager may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Construction Manager's opinion to protect City from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. City has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Construction Manager has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

1. Forty-five (45) days after presentation of the Application for Payment to City with Construction Manager's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by City to Contractor. Payment will be made by the City to the Contractor in accordance with City's normal accounts payable procedure.

D. Reduction in Payment

1. City may refuse to make payment of the full amount recommended by Construction Manager because:
 - a. claims have been made against City on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to City to secure the satisfaction and discharge of such Liens;

- c. there are other items entitling City to a set-off against the amount recommended; or
 - d. City has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If City refuses to make payment of the full amount recommended by Construction Manager, City will give Contractor written notice (with a copy to Construction Manager) within (10) days after receipt of each Application for Payment stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. City shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by City and Contractor, when Contractor corrects to City's satisfaction the reasons for such action.
3. If it is subsequently determined that City's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

Section 14.03 Contractor's Warranty of Title

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to City no later than the time of payment free and clear of all Liens.

Section 14.04 Substantial Completion

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify City and Construction Manager in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Construction Manager issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, City, Contractor, and Construction Manager shall make an inspection of the Work to determine the status of completion. If Construction Manager does not consider the Work substantially complete, Construction Manager will notify Contractor in writing giving the reasons therefor.
- C. If Construction Manager considers the Work substantially complete, Construction Manager will deliver to City a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. City shall have seven (7) days after receipt of the tentative certificate during which to make written objection to Construction Manager as to any provisions of the certificate or attached list. If, after considering such objections, Construction Manager concludes that the Work is not substantially complete, Construction Manager will within fourteen (14) days after submission of the tentative certificate to City notify Contractor in writing, stating the reasons therefor. If, after consideration of City's objections, Construction Manager considers the Work substantially complete, Construction Manager will within said fourteen (14) days execute and deliver to City and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Construction Manager believes justified after consideration of any objections from City.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Construction Manager will deliver to City and Contractor a written recommendation as to division of responsibilities pending final payment between City and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless City and Contractor agree otherwise in writing and so inform Construction Manager in writing prior to Construction Manager's issuing the definitive certificate of Substantial Completion, Construction Manager's aforesaid recommendation will be binding on City and Contractor until final payment.
- E. City shall have the right to exclude Contractor from the Site after the date of Substantial Completion

subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

Section 14.05 Partial Utilization

- A. Prior to Substantial Completion of all the Work, City may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which City, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by City for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.
 - 1. City at any time may request Contractor in writing to permit City to use or occupy any such part of the Work which City believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to City and Engineer that such part of the Work is substantially complete and request Construction Manager to issue a certificate of Substantial Completion for that part of the Work.
 - 2. Contractor at any time may notify City and Construction Manager in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Construction Manager to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, City, Contractor, and Construction Manager shall make an inspection of that part of the Work to determine its status of completion. If Construction Manager does not consider that part of the Work to be substantially complete, Construction Manager will notify City and Contractor in writing giving the reasons therefor. If Construction Manager considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

Section 14.06 Final Inspection

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Construction Manager will promptly make a final inspection with City and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

Section 14.07 Final Payment

- A. Application for Final Payment
 - 1. After Contractor has, in the opinion of Construction Manager, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
 - 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against City that Contractor believes are unsettled; and

- d. complete and legally effective releases or waivers (satisfactory to City) of all Lien rights arising out of or Liens filed in connection with the Work.
 3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by City, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which City or City's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to City to indemnify City against any Lien.
- B. Construction Manager's Review of Application and Acceptance
1. If, on the basis of Construction Manager's observation of the Work during construction and final inspection, and Construction Manager's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Construction Manager is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Construction Manager will, within ten (10) days after receipt of the final Application for Payment, indicate in writing Construction Manager's recommendation of payment and present the Application for Payment to City for payment. At the same time Construction Manager will also give written notice to City and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Construction Manager will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. Payment Becomes Due
1. Forty-five (45) days after Notice of Completion by City Council and within sixty (60) days after the presentation to City of the Application for Payment and accompanying documentation, the amount recommended by Construction Manager, less any sum City is entitled to set off against Construction Manager's recommendation, including but not limited to liquidated damages, will become due and will be paid by City to Contractor. In the case of a disputed claim, the City may withhold a portion of final payment in an amount not to exceed 150 percent of any amount disputed in accordance with California Public Contracts Code Section 7107 (c).

Section 14.08 Final Completion Delayed

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Construction Manager so confirms, City shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Construction Manager, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by City for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Construction Manager with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

Section 14.09 Waiver of Claims

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by City against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from

Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against City other than those previously made in accordance with the requirements herein and expressly acknowledged by City in writing as still unsettled.

ARTICLE 15. SUSPENSION OF WORK AND TERMINATION

Section 15.01 City May Suspend Work

- A. At any time and without cause, City may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

Section 15.02 City May Terminate for Cause

- A. The occurrence of any one or more of the following events will justify termination for cause:
 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's disregard of the authority of Construction Manager or Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02A. occur, City will provide written notice to Contractor and Surety to arrange a conference with Contractor and Surety to address Contractor's failure to perform the Work. Conference shall be held not later than fifteen (15) days, after receipt of notice.
 1. If the City, the Contractor, and the Surety do not agree to allow the Contractor to proceed to perform the Construction Contract, the City may, to the extent permitted by Laws and Regulations, declare a Contractor Default and formally terminate the Contractor's right to complete the Contract. Contractor Default shall not be declared earlier than twenty (20) days after the Contractor and Surety have received notice of conference to address Contractor's failure to perform the Work.
 2. If Contractor's services are terminated, Surety shall be obligated to take over and perform the Work. If Surety does not commence performance thereof within fifteen (15) consecutive calendar days after date of an additional written notice demanding Surety's performance of its obligations, then City, without process or action at law, may take over any portion of the Work and complete it as described below.
 3. If City completes the Work, City may exclude Contractor and Surety from the site and take possession of the Work and of all tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by Contractor and Surety (without liability to Contractor and Surety for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which City has paid Contractor or Surety but which are stored elsewhere, and finish the Work as City may deem expedient.
 4. Whether City or Surety completes the Work, Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses and damages sustained by City arising out of or resulting from completing the Work, such excess will be paid to Contractor. If such claims, costs, losses and damages exceed such unpaid

balance, Contractor shall pay the difference to City. Such claims, costs, losses and damages incurred by City will be reviewed by Engineer as to their reasonableness and when so approved by Engineer incorporated in a Change Order, provided that when exercising any rights or remedies under this Paragraph, City shall not be required to obtain the lowest price for the Work performed.

5. Neither City, Engineer, nor any of their respective consultants, agents, officers, directors or employees shall be in any way liable or accountable to Contractor or Surety for the method by which the completion of the said Work, or any portion thereof, may be accomplished or for the price paid therefor.
 6. City, notwithstanding the method used in completing the Contract, shall not forfeit the right to recover damages from Contractor or Surety for Contractor's failure to timely complete the entire Contract. Contractor shall not be entitled to any claim for damages on account of the method used by City in completing the Contract.
 7. Maintenance of the Work shall continue to be Contractor's and Surety's responsibilities as provided for in the bond requirements of the Contract Documents or any special guarantees provided for under the Contract Documents or any other obligations otherwise prescribed by law.
- C. If City proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by City arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to City. Such claims, costs, losses, and damages incurred by City will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph City shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven (7) days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than thirty (30) days of receipt of said notice.
- E. Where Contractor's services have been so terminated by City, the termination will not affect any rights or remedies of City against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by City will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

Section 15.03 City May Terminate For Convenience

- A. Upon seven (7) days written notice to Contractor, Construction Manager and Engineer, City may, without cause and without prejudice to any other right or remedy of City, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

Section 15.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than ninety (90) consecutive days by City or under an order of court or other public authority, or (ii) Construction Manager fails to act on any Application for Payment within thirty (30) days after it is submitted, or (iii) City fails for thirty (30) days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven (7) days written notice to City and Construction Manager, and provided City or Construction Manager do not remedy such suspension or failure within that time, terminate the Contract and recover from City payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Construction Manager has failed to act on an Application for Payment within thirty (30) days after it is submitted, or City has failed for thirty (30) days to pay Contractor any sum finally determined to be due, Contractor may, seven (7) days after written notice to City and Construction Manager, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16. DISPUTE RESOLUTION

Section 16.01 Methods and Procedures

- A. The process for resolving claims shall comply with the California Public Contracts Code as amended by Section 9204 et. seq.. The Contractor shall furnish sufficient documentation, as determined by the Construction Manager, to support any claim.
- B. Either City or Contractor may request mediation of any Claim submitted to Construction Manager for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- C. Upon receipt of a claim pursuant, the City shall conduct a reasonable review of the claim and, within a period not to exceed forty-five (45) days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the City and Contractor may, by mutual agreement, extend the time period provided in this subdivision.
- D. If the City needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the City shall have up to fourteen (14) days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.
- E. The City shall pay any undisputed portion of the claim. Payment shall be processed and made within sixty

(60) days after the City issues its written statement.

- F. If the City fails to issue a written statement, the claim shall be deemed rejected in its entirety. A claim that is denied by reason of the City's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.
- G. If the Contractor disputes the City's written response, or if the City fails to respond to a claim issued within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the City shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.
- H. Within ten (10) business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the City shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within sixty (60) days after the City issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the City and Contractor sharing the associated costs equally. The City and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.
- I. Amounts not paid in a timely manner as required by this section shall bear interest at 2 percent per annum.
- J. If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, Contractor may present to the City a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that Contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the City shall furnish reasonable documentation to support the claim. Within forty-five (45) days of receipt of this written request, Contractor shall notify the subcontractor in writing as to whether the Contractor presented the claim to the City and, if Contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.
- K. City and Contractor shall participate in the mediation process in good faith. The process shall be concluded within the timeline as stipulated under the California Public Contracts Code. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- L. If the Claim is not resolved by mediation, City's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding thirty (30) days after termination of the mediation unless, within that time period, City or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
 - 2. agrees with the other party to submit the Claim to another dispute resolution process, or
 - 3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17. MISCELLANEOUS

Section 17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Section 17.02 Computation of Times

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

Section 17.03 Cumulative Remedies

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.
- B. No action or failure to act by the City, the Engineer, or the Construction Manager shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

Section 17.04 Survival of Obligations

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

Section 17.05 Controlling Law

- A. This Contract is to be governed by the law of the state of California, the county of San Joaquin, and city of Manteca.

Section 17.06 Headings

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

Section 17.07 Penalty for Collusion

- A. If, at any time, it is found that the person, firm, or corporation to whom the Contract has been awarded has, in presenting any bid or bids, colluded with any other party or parties, then the Contract shall be null and void, and the Contractor and its sureties shall be liable for loss or damage which the City may suffer

thereby, and the City may advertise for new bids for said Work.

****END OF SECTION****

EXHIBIT “E”

Supplementary General Conditions

SECTION 00800

SUPPLEMENTARY GENERAL CONDITIONS

1.0 MODIFICATIONS TO THE GENERAL CONDITIONS

These Supplementary General Conditions amend and supplement Section 00700, GENERAL CONDITIONS, and other provisions of the contract documents as indicated below. All provisions of the General Conditions that are amended or supplemented remain in full force and effect as so amended or supplemented. All provisions of the General Conditions which are not so amended or supplemented remain in full force and effect.

1.1 Time Allowed for Completion

In accordance with the provisions of Section 00700, **Contract Time**, substantial completion of this project shall be completed within ONE THOUSAND ONE HUNDRED EIGHTY CALENDAR DAYS (1,180 CALENDAR DAYS) and ONE THOUSAND TWO HUNDRED SEVENTY CALENDAR DAYS (1,270 CALENDAR DAYS) consecutive days from the date established in the Notice to Proceed for the commencement of Contract Time. In addition, the following milestone item(s) shall be substantially completed within the time period defined below.

<u>Milestone</u>	<u>Calendar Days from NTP</u>
<i>Preconstruction Phase</i>	
Milestone A – 50% Design	111 Calendar Days
Milestone B – 75% Design	242 Calendar Days
Milestone C – Development of GMP	303 Calendar Days
Milestone D – City Approval of GMP	351 Calendar Days
<i>Construction Phase</i>	
Milestone E – 90% Design	434 Calendar Days
Milestone F – Final Design	509 Calendar Days
Milestone G – Construction Substantial Completion	1,180 Calendar Days
Milestone H – Construction Final Completion	1,270 Calendar Days

1.2 Damages for Delays

In accordance with the provisions of Section 00700, **Liquidated Damages**, for the period of time that any portion of the work remains unfinished after the time fixed for an interim milestone and/or Substantial Completion in Section 00800-1.1, **Time Allowed for Completion**, as modified by extensions of time granted by the City, it is understood and agreed that the Contractor shall pay the City the damages listed below.

<u>Milestone</u>	<u>Liquidated Damages Amount</u>
<i>Preconstruction Phase</i>	\$10,000
Milestone A – 50% Design	\$10,000
Milestone B – 75% Design	\$10,000
Milestone C – Development of GMP	\$10,000
Milestone D – City Approval of GMP	\$10,000

<i>Construction Phase</i>	
Milestone E – 90% Design	\$10,000
Milestone F – Final Design	\$10,000
Milestone G – Construction Substantial Completion	\$10,000
Milestone H – Construction Final Completion	\$10,000

1.3 **Weather Days**

In accordance with the provisions of Paragraph 00700-6.4.2.C, Weather Delays, the following allowance(s) for weather caused delay have been included in the time allowed for completion. For the Construction Schedule defined in Section 01310-4.0, **WEATHER CONDITIONS AND WEATHER DAY ALLOWANCE**, the weather days shall be allocated as listed below:

<u>Milestone</u>	<u>Weather Day Allowance (Calendar Days)</u>
<i>Preconstruction Phase</i>	
Milestone A – 50% Design	0 Calendar Days
Milestone B – 75% Design	0 Calendar Days
Milestone C – Development of GMP	0 Calendar Days
Milestone D – City Approval of GMP	0 Calendar Days
<i>Construction Phase</i>	
Milestone E – 90% Design	0 Calendar Days
Milestone F – Final Design	0 Calendar Days
Milestone G – Construction Substantial Completion	0 Calendar Days
Milestone H – Construction Final Completion	0 Calendar Days

This allowance represents the City's assessment of potential lost working days. This allowance includes both weather days due to inclement weather conditions and the conditions resulting from weather in accordance with Paragraph 00700, Weather Delays. These weather days shall be included in the Contractor's schedule as specified in Section 01310, WEATHER CONDITIONS. This allowance is not a warranty as to the extent that weather may or may not impact the Work. The Contractor shall make its own independent assessment of potential impacts to the Work due to weather based on the Project location, the Work required, the Contract Period, the schedule, and the Contractor's planned means, methods and appliances, and the Contractor shall take such factors into consideration in its Bid and planning of the Work. The Contractor is responsible for determining the means, methods and appliances for prosecuting the Work as defined in Section 00700, Means, Methods and Appliances.

5.0 **SUBSTANTIAL COMPLETION**

Substantial completion of the Project as required by Section 00700, **Substantial Completion**, requires that the following portions of the Work must be operational and ready for the City's continuous use as intended:

The following items of work must be fully tested and functional for Project Substantial Completion to be attained:

Completion of the Corrective Work Item(s)

All health and safety systems are complete, fully tested and operational.

All mechanical (including HVAC), electrical (including lighting), control, and instrumentation equipment is installed, fully tested and operational in normal and automatic modes.

All civil, structural, demolition, and architectural elements identified in the Contract Documents are completed.

All alarms are fully functional, tested and demonstrated to properly associate locally, remotely and of the SCADA system.

Training has been completed for all electrical, mechanical and instrumentation systems.

Approved final copies of the Project's Operation and Maintenance Manuals as specified in the Contract Documents and as required in Sections 01010 and 01730.

All instruments, local and remote, are fully tested and functional. All interlocked functions between equipment items are tested and documented.

Portions of the Work not essential to the system operation, which can be completed without interruption of system operations, may be completed after the Work is accepted as substantially complete, and may include the following items:

Final Site Clean-Up

Final Building Clean-Up

Completion of the Final Punch List prepared by the Construction Manager.

A. Paragraph 00700-3.03.B.2:

Add the following paragraph:

Where conflicts exist among the Contract Documents and/or any reference specifications, such conflicts shall be clarified according to the following order, the first ranked taking precedence over the lower ranked:

1. Amendments, Change Orders or other modifications to the Contract Documents, as executed by the City in accordance with the requirements of the Contract Documents.
2. Agreement
3. Supplementary Conditions
4. General Conditions
5. Division 01 Documents
6. Plans and Technical Specifications
7. Notice Inviting Bids and Information to Bidders
8. Contract Payment Bond
9. Performance Bond
10. Warranty Bond (if required)
11. Any provisions required by law or valid regulations to be inserted in this contract,

- whether actually inserted or not
12. Appendices (photographs, data contained in reports, and other information).

Additional rules of interpretation:

1. Written numbers over figures, unless obviously incorrect.
2. Figured dimensions over scaled dimensions.
3. Large-scale drawings over small-scale drawings.
4. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete the Work required by Contract Documents, will be resolved in favor of the actual quantities, date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

B. Paragraph 00700-5.04B:

The entities listed below are "additional insureds as their interest may appear" including their respective officers, directors, agents and employees.

Construction Manager: TBD

The insured and the additional insured shall be listed in the insurance coverage by specific name and not by genre.

C. Paragraph 00700-6.11.A.4:

Add the following paragraph:

All Contractor activities including site ingress/egress shall be coordinated with the City of Manteca. Site access shall be secured by Contractor personnel after typical hours of City operation, **6:30 a.m. to 4:00 p.m., Monday through Friday**, unless scheduled Two weeks in advance with the Construction Manager.

D. Paragraph 00700-12.01.D:

Add the following paragraphs:

The Contractor shall be responsible to reimburse the City for any unforeseen costs incurred, including labor and materials, relating to any disruption of City operations or services due to Contractor's activities or negligence. Unforeseen City costs may include, but are not limited to:

1. Labor, materials, and administrative civil liabilities associated with sanitary sewer overflows/regulatory violations due to Contractor activities or negligence.
2. Labor, including overtime hours, and materials associated with City forces preparing for a scheduled outage that is canceled subsequently by the Contractor.
3. Labor, including overtime hours, and materials associated with City activities

necessitated by outages extending beyond the scheduled duration caused by the Contractor.

Reimbursement to the City shall be accomplished through a 'back-charge' and a resultant reduction in contract price. Documentation of City costs will be furnished to the Contractor.

E. Paragraph 00700-12.03F:

Time extensions will not be granted for rain, wind, flood, or other natural phenomena of normal intensity for the locality where Work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the month involved with the average of the preceding 10-year climatic range during the same month based on U.S. Weather Bureau statistics for the locality where the Work is performed.

****END OF SECTION****

EXHIBIT “F”

CA Government Code Section 14310 Questionnaire

Section 00425
CA GOVERNMENT CODE SECTION 14310 QUESTIONNAIRE

SECTION 00425
CA GOVERNMENT CODE SECTION 14310 QUESTIONNAIRE
(To be submitted with bid)

Pursuant to California Government Code 14310, the bidder shall complete, under penalty of perjury, the following questionnaire below.

1. Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of the law or a safety regulation?	YES___ NO ☒
2. Has a contractor's license held by your firm and/or any owner, officer or partner of your firm been revoked at anytime in the last five years?	YES___ NO ☒
3. Within the last five years, has a surety firm completed a contract on your firms behalf, or paid for completion of a contract to which your firm was a party, because your firm was considered to be in default or was terminated for cause by the project owner?	YES___ NO ☒
4. At the time of submitting this questionnaire, is your firm ineligible to bid on or be awarded a public works contract, or perform as a contractor on a public works contract, pursuant to either California Labor Code Section 1777.1 (prevailing wage violations) or Labor Code Section 1777.7 (apprenticeship violations)?	YES___ NO ☒
5. At any time in the last five years, has your firm, or any of its owners, officers or partners been convicted of a crime involving the awarding of a contract for a government/public construction project, or the bidding or performance of a government/public contract?	YES___ NO ☒
6. Within the last five years, has your firm been assessed liquidated damages on any public contract?	YES___ NO ☒
7. Within the last three years has your firm or representatives been debarred from bidding on, or completing any public works construction contract for any reason?	YES___ NO ☒

Section 00425

CA GOVERNMENT CODE SECTION 14310 QUESTIONNAIRE

8. Has CAL OSHA assessed penalties against your firm for any serious or willful violation occurring on a construction project at anytime in the last three years?	YES___ NO <u>✓</u>
9. In the past three years, have civil penalties or Notice of Complaint (letter of warning) been issued or assessed against your firm pursuant to California Labor Code 1777.7 for violation of California public works apprenticeship requirements by the California Division of Apprenticeship Standards (DAS)?	YES___ NO <u>✓</u>
10. In the past three years, has a public agency in California withheld contract payments or assessed penalties against your firm for violation of public works prevailing wage requirements?	YES___ NO <u>✓</u>
11. Has your firm been assessed penalties for violation of public works prevailing wage requirements by the DLSE (Labor Commissioner)?	YES___ NO <u>✓</u>
12. Does your firm have any pending complaints or investigations by a regulatory authority?	YES___ NO <u>✓</u>

I, the undersigned, certify and declare that I have read and understood the questionnaire. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date 5/20/25

Signature Carl Overaa

** END OF SECTION **

EXHIBIT "G"

Equal Employment Opportunity Certification

Section 00431
EQUAL EMPLOYMENT OPORTUNITY CERTIFICATION

SECTION 00431

EQUAL EMPLOYMNET OPORTUNITY CERTIFICATION
(To Be Submitted with Bid)

I the bidder C. Overaa & Co., and
proposed subcontractor(s) TBD, hereby
certify under penalty of perjury that the foregoing is true and correct:

I/we has/have ☒ , has/have not ☐ , participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filling requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

The bidder must place a checkmark after "has/have" or "has/have not" in one of the blank spaces provided. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Bidders Name: C. Overaa & Co.

Date: 5/20/25

Bidders Signature: Carl Overaa
Authorized Agent

EXHIBIT “H”

Public Contract Code Section 10285.1 Certification

Section 00432
PUBLIC CONTRACT CODE SECTION 10232 CERTIFICATION

SECTION 00432

PUBLIC CONTRACT CODE SECTION 10285.1 CERTIFICATION
(To Be Submitted with Bid)

I the bidder C. Overaa & Co., and
proposed subcontractor TBD, hereby
certify under penalty of perjury that the foregoing is true and correct:

I/we has/have ☒ , has/have not ☐ , participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filling requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.) Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

The bidder must place a checkmark after "has/have" or "has/have not" in one of the blank spaces provided. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Bidders Authorized Agent

Carl Overaa

Signature

Name: Carl Overaa

Title: President

Bidders' Subcontractor Authorized Agent

TBD

Signature

Name: TBD

Title: TBD

EXHIBIT "I"

Public Contract Code Section 10232 Certification

Section 00433
PUBLIC CONTRACT CODE SECTION 10232 CERTIFICATION

SECTION 00433

PUBLIC CONTRACT CODE SECTION 10232 CERTIFICATION
(To Be Submitted with Bid)

I the bidder C. Overaa & Co., In accordance with Public Contract Code Section 10232, the Contractor, hereby state under penalty of perjury, that:

- ☒ No more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

The bidder must place a checkmark in one of the box above. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Bidders Authorized Agent

Carl Overaa

Signature

Name: Carl Overaa

Title: President

*** END OF SECTION ***

EXHIBIT “J”

Debarment and Suspension Certification

Section 00434
DEBARMENT AND SUSPENSION CERTIFICATION

SECTION 00434

DEBARMENT AND SUSPENSION CERTIFICATION
(To Be Submitted with Bid)

I the bidder C. Overaa & Co., In accordance with Title 49, Code of Federal Regulations, Part 29, hereby state under penalty of perjury, that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- ☒ Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency.
- ☒ Has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years
- ☒ Does not have a proposed debarment pending.
- ☒ Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

The bidder must place a checkmark in the applicable box(es) above. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Bidders Authorized Agent

Carl Overaa

Signature

Name: Carl Overaa

Title: President

EXHIBIT “K”

Local Business Enterprise

SECTION 00435**LOCAL BUSINESS ENTERPRISE****1. RECITALS**

1. Whereas it is the responsibility of the City to assure that all competitive bids for services, supplies and projects, as well as all professional services, are comprehensively reviewed and evaluated by City staff to ensure the best quality of work is received for the least amount of taxpayer money; and
2. Whereas the City is desirous of providing a preference for local business enterprises (vendors), in an attempt to keep as many local jobs as local as possible, and
3. Whereas the City hopes to balance this preference with assuring the public that the best enterprise/vendor is selected for each and every City contract.

2. POLICY

Definition of “Local Business Enterprise (LBE):” A business enterprise, including but not limited to a sole proprietorship, partnership or corporation, which has a legitimate business presence in the incorporated City limits of the City of Manteca. Evidence of legitimate presence in Manteca shall include:

- A. Having a current Manteca business license; and
- B. Having either of the following types of offices operating legally within the City of Manteca:
 1. The contractor’s principal office; or
 2. The contractor’s regional, branch or satellite office with at least one full-time employee located in the corporate boundaries of the City of Manteca. A post office box address alone does not constitute a “Local Business Enterprise.”

Public, Competitive Bids:

If two or more bids received from responsible bidders are for the same total amount or unit price – quality and service being equal – preference shall be given to the LBE.

In the event two or more bids are received and they are not for the same total amount or unit price, and a bid submitted by **a qualified LBE is within 5% (total net cost)** of the lowest bid or quote, the LBE may be deemed to be the lowest bidder if the LBE agrees, in writing within one business day, to reduce its bid to match the bid or quote of the lowest bidder, providing that the City determines the LBE to be a responsible bidder.

Professional Services:

For professional services not requiring formal bids or quotations, vendor selection is based primarily on qualifications, project understanding and schedule, with cost a secondary concern. Nonetheless, a proposal submitted by a qualified LBE will be taken into account in reaching a final consultant selection decision. A qualified **LBE will be provided 5 points out of 100 in scoring the proposals.**

LOCAL BUSINESS ENTERPRISE

(To be submitted with bid)

Are you a local business enterprise according to this policy?

Yes _____ No _____ ✓

If the answer is yes, complete the following:

City of Manteca Business License Number: _____ N/A

Address of local office with at least one full-time employee:

_____ N/A

I certify under penalty of perjury that the foregoing is true and correct.

Bidders Name: C. Overaa & Co.Date: 1/22/2026Bidders Signature: Carl Overaa
Authorized Agent

EXHIBIT “L”

Non-Lobbying Certification

Section 00436
NON LOBYING CERTIFICATION

SECTION 00436

NON LOBYING CERTIFICATION
(To Be Submitted with Bid)

I the bidder C. Overaa & Co., in accordance with Section 1352, Title 31 of the US Code, hereby state under penalty of perjury, that, to the best of my knowledge and belief, that:

- ☒ No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreements not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency.
- ☒ If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in conformance with its instructions.
- ☒ This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
- ☒ I shall require that the language of this certification be included in the award documents for all subcontractors at all tiers and that all subrecipients shall certify and disclose accordingly.

The bidder must place a checkmark in the applicable box(es) above. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Bidders Authorized Agent

Carl Overaa

Signature

Name: Carl Overaa

Title: President

EXHIBIT “M”

Site Visit Affidavit

Section 00440
SITE VISIT AFFIDAVIT

SECTION 00440

SITE VISIT AFFIDAVIT
(To Be Submitted with Bid)

NAME OF PROJECT: WQCF AMMONIA SIDESTREAM TREATMENT & UV
REHABILITATION PROJECT CIP 25004 & 25005

State of California

County of Contra Costa

Carl Overaa, being first duly sworn, deposes
(Printed Name of Contractor's Authorized Representative)

he or she is

President of C. Overaa & Co.,
(Title of Representative) (Bidder's Name)

the party making the bid, has visited the Site of the Work as described in the Contract Documents and has examined and familiarized themselves with the existing conditions, as well as all other conditions relating to the construction which will be performed. The submitting of a bid shall be considered an acknowledgement on the part of the Bidder of familiarity with conditions at the site of Work. The Bidder further acknowledges that the site examination has provided adequate and sufficient information related to existing conditions which may affect cost, progress or performance of the Work.

Signed this 22 day of January, 20 26.

Carl Overaa

Authorized Signature

*** END OF SECTION ***

EXHIBIT “N”

Acknowledgement of Insurance Requirements

Section 00470

ACKNOWLEDGEMENT OF INSURANCE REQUIREMENTS

SECTION 00470

**ACKNOWLEDGEMENT OF INSURANCE REQUIREMENTS
(To be submitted with Bid)**

At the time the bid proposal is submitted to the City, the Bidder is not required to obtain the required insurance coverage as outlined in the Contract Documents. The objective of this acknowledgement is for the Bidder to verify they have reviewed and understood the insurance requirements and that they are able to obtain the insurance coverage if awarded the Project.

If awarded the Project, the Bidder also acknowledges that the City will not accept contract change orders that are based on insurance costs that were not appropriately considered.

Bidder certifies that full compensation for the requirements set forth in Section 00820 **LIABILITY AND INSURANCE REQUIREMENTS** of the Contract Documents is included in the Bid Price.

Bidder acknowledges that he has reviewed the insurance requirements for the WQCF Ammonia Sidestream Treatment (CIP No. 25005) and Ultra-Violet Disinfection System Rehabilitation (CIP No. 25004) Project and certifies that he can and will acquire the insurance specified coverages and limits if the City awards the Project to the Bidder.

Bidder's Signature Carl Overaa

Date 5/20/25

*** END OF SECTION ***

EXHIBIT “O”

Non-Collusion Affidavit

SECTION 00480

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

State of California)
) ss.
County of **Contra Costa**

Carl Overaa, being first duly sworn, deposes and say that he or she is **President** of C. Overaa & Co. the party 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, business entity, business combination, or corporation; that the bid is genuine and not collusive or sham; that the 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; 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 the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, 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.

Carl Overaa
Signature

C. Overaa & Co.
Name of Bidder

President
Title

5/8/25
Date

Subscribed and sworn to before me this

8 day of May, 20 25.

See attached.
Signature of Notary Public in and for
the County of _____
State of California.

*** END OF SECTION ***

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Contra Costa

Subscribed and sworn to (or affirmed) before me on this 8th
day of May, 2025, by Carl Overaa

proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.



(Seal)

Signature Brown

EXHIBIT “P”

DIR Compliance Affidavit

Section 00490
DEPARTMENT OF INDUSTRIAL RELATIONS COMPLIANCE AFFIDAVIT

SECTION 00490

DEPARTMENT OF INDUSTRIAL RELATIONS COMPLIANCE AFFIDAVIT

In accordance with California Labor Code as amended through Senate Bill (SB) 96, no contractor or subcontractor shall be listed on a bid proposal for a public works project or awarded a contract for public work on a public works project unless registered with the California Department of Industrial Relations (DIR).

This project is subject to compliance monitoring and enforcement by the DIR. For information regarding registration, please go to:

www.dir.ca.gov

I, the Bidder, certify that:

I am aware of the provisions of SB 96 and subsequent DIR regulations which require Contractors/Vendors to comply with all labor compliance requirements including, but not limited to, prevailing wage requirements, Labor Code Sections 1725.5, 1771.1(a), 1774-1776, 1777.5, 1813, 1815, Public Works Contractor Registration Program, Electronic Certified Payroll Records to Labor Commissioner, and other requirements described in the DIR website. I will comply with such provisions before commencing the performance of the work of this contract and maintain compliance throughout the completion of said contract. Any fees levied by DIR as a result of contractor's non-compliance shall be borne by the contractor.

Carl Overaa

Signature

5/20/25

Date

Carl Overaa

Print Name

C. Overaa & Co.

Business Name

President

Title

106793

CSLB License Number

1000000871

DIR Registration Number

EXHIBIT “Q”

Statement Acknowledging Penal and Civil Penalties Concerning The Contractors’ Licensing
Laws

SECTION 00491

STATEMENT ACKNOWLEDGING PENAL AND CIVIL PENALTIES CONCERNING
THE CONTRACTORS' LICENSING LAWS

[Business & Professions Code § 7028.15]

[Public Contract Code § 20103.5]

I, the undersigned, certify that I am aware of the following provisions of California law and that I, or the entity on whose behalf this certification is given, hold a currently valid California contractor's license as set forth below:

Business & Professions Code § 7028.15:

(a) It is a misdemeanor for any person to submit a bid to a public agency in order to engage in the business or act in the capacity of a contractor within this state without having a license therefor, except in any of the following cases:

- (1) The person is particularly exempted from this chapter.
- (2) The bid is submitted on a state project governed by Section 10164 of the Public Contract Code or on any local agency project governed by Section 20104 [now § 20103.5] of the Public Contract Code.

(b) If a person has been previously convicted of the offense described in this section, the court shall impose a fine of 20 percent of the price of the contract under which the unlicensed person performed contracting work, or four thousand five hundred dollars (\$4,500), whichever is greater, or imprisonment in the county jail for not less than 10 days nor more than six months, or both.

In the event the person performing the contracting work has agreed to furnish materials and labor on an hourly basis, "the price of the contract" for the purposes of this subdivision means the aggregate sum of the cost of materials and labor furnished and the cost of completing the work to be performed.

(c) This section shall not apply to a joint venture license, as required by Section 7029.1. However, at the time of making a bid as a joint venture, each person submitting the bid shall be subject to this section with respect to his or her individual licensure.

(d) This section shall not affect the right or ability of a licensed architect, land surveyor, or registered professional engineer to form joint ventures with licensed contractors to render services within the scope of their respective practices.

(e) Unless one of the foregoing exceptions applies, a bid submitted to a public agency by a contractor who is not licensed in accordance with this chapter shall be considered nonresponsive and shall be rejected by the public agency. Unless one of the foregoing exceptions applies, a local public agency shall, before awarding a contract or issuing a purchase order, verify that the Contractor was properly licensed when the Contractor submitted the bid. Notwithstanding any other provision of law, unless one of the

Section 00491

DEPARTMENT OF INDUSTRIAL RELATIONS COMPLIANCE AFFIDAVIT

foregoing exceptions applies, the registrar may issue a citation to any public officer or employee of a public entity who knowingly awards a contract or issues a purchase order to a Contractor who is not licensed pursuant to this chapter. The amount of civil penalties, appeal, and finality of such citations shall be subject to Sections 7028. 7 to 7028.13, inclusive. Any contract awarded to, or any purchase order issued to, a contractor who is not licensed pursuant to this chapter is void.

- (f) Any compliance or noncompliance with subdivision (e) of this section, as added by Chapter 863 of the Statutes of 1989, shall not invalidate any contract or bid awarded by a public agency during which time that subdivision was in effect.
- (g) A public employee or officer shall not be subject to a citation pursuant to this section if the public employee, officer, or employing agency made an inquiry to the board for the purposes of verifying the license status of any person or contractor and the board failed to respond to the inquiry within three business days. For purposes of this section, a telephone response by the board shall be deemed sufficient.

Public Contract Code § 20103 .5:

In all contracts subject to this part where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with the laws of this state. However, at the time the contract is awarded, the Contractor shall be properly licensed in accordance with the laws of this state. The first payment for work or material under any contract shall not be made unless and until the Registrar of Contractors verifies to the agency that the records of the Contractors' State License Board indicate that the Contractor was properly licensed at the time the contract was awarded. Any bidder or contractor not so licensed shall be subject to all legal penalties imposed by law, including, but not limited to, any appropriate disciplinary action by the Contractors' State License Board. The agency shall include a statement to that effect in the standard form of pre-qualification questionnaire and financial statement. Failure of the bidder to obtain proper and adequate licensing for an award of a contract shall constitute a failure to execute the contract and shall result in the forfeiture of the security of the bidder.

<u>Carl Overaa</u> <u>5/20/25</u> Signature, Date	<u>C. Overaa & Co.</u> Business Name
<u>Carl Overaa</u> Print Name	<u>106793 A, B</u> Contractor License Number, Class
<u>President</u> Title	<u>5/31/2027</u> Contractor License Expiration

EXHIBIT “R”

Faithful Performance Bond

SECTION 00610

FAITHFUL PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, THAT, WHEREAS, City of Manteca, hereinafter designated the "City," has, on _____, 20____, awarded to _____, hereinafter designated as the "Principal," a Contract for the construction of the **WQCF AMMONIA SIDESTREAM TREATMENT & UV REHABILITATION PROJECT CIP 25004 & 25005**.

WHEREAS, said Principal is required under the terms of said Contract to furnish a bond for the faithful performance of said Contract:

NOW, THEREFORE, WE, the Principal, and _____, as Surety, are held and firmly bound unto the City the penal sum of _____, dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal, it or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreements in the said contract and any alterations made as therein provided, on it or their part to be kept and performed, at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless, the City, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

It is acknowledged that the Contract provides for one-year warranty period, during which time this bond remains in full force and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this _____day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Seal)

Principal

Signature for Principal

Title of Signator

(Seal)

Surety

Signature for Surety

Title of Signator

APPROVED AS TO FORM:

Riana Daniel, Interim City Attorney

APPROVED AS TO SUFFICIENCY:

Kevin Jorgensen II, Director of Engineering

Attach Notary Form Here

****END OF SECTION****

EXHIBIT “S”

Payment Bond

SECTION 00620

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, THAT, WHEREAS, City of Manteca, hereinafter designated as the "City," has, on _____, 20____, awarded to _____, hereinafter designated as the "Principal," a Contract for the construction of the **WQCF AMMONIA SIDESTREAM TREATMENT & UV REHABILITATION PROJECT CIP 25004 & 25005**, and

WHEREAS, said Principal is required to furnish a bond in connection and with said Contract, providing that if said Principal, or any of it or its subcontractors shall fail to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety of this bond will pay the same to the extent hereinafter set forth:

NOW, THEREFORE, we, the Principal, and _____, as Surety, are held and firmly bound unto the City the penal sum of _____Dollars (\$ _____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if said Principal, it or its heirs, executors, administrators, successors, or assigns, shall fail to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind or for amount due under the Unemployment Insurance Act with respect to such work or labor, or for any amounts due, or to be withheld pursuant to Sections 18806 of the Revenue and Taxation Code of the State of California with respect to such work or labor, then said surety will pay the same in or to an amount not exceeding the amount hereinabove set forth, and also will pay in case suit is brought upon this bond, such reasonable attorney's fees to the City as shall be fixed by the court.

This bond shall insure to the benefit of any and all persons, companies, and corporations named in Section 3181 of the Civil Code of the State of California so as to give a right of action to them or their assigns in any suit brought upon this bond.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition of the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall, in any way, affect its obligations of this bond, and it does hereby waive notice of any change, extension of time, alteration, or addition to the terms of the contract or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

ATTACHMENT 3

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this _____ day of _____, 20 __, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Principal

(Seal)

Signature for Principal Title

Surety

(Seal)

Signature for Surety Title

APPROVED AS TO FORM:

APPROVED AS TO SUFFICIENCY:

Riana Daniel, Interim City Attorney

Kevin Jorgensen II, Director of Engineering

Attach Notary Form Here

*** END OF SECTION ***

EXHIBIT “T”

Warranty Bond

SECTION 00630

WARRANTY BOND

Whereas, the City Council of the City of Manteca, State of California, and

(hereinafter designated as "Contractor") have entered into a Contract whereby Contractor agrees to repair any improvements set forth in said Contract identified as the **WQCF AMMONIA SIDESTREAM TREATMENT & UV REHABILITATION PROJECT CIP 25004 & 25005** and awarded by Resolution to Contractor on _____, 20____, is hereby referred to and made a part hereof, and

Whereas, the Contractor is required under the terms of said Contract to furnish a one year bond starting at Final Completion for the Warranty of Improvements of said Contract.

Now, therefore, we, the Contractor and _____ as surety, are held and firmly bound unto the City of Manteca, hereinafter called "City" in the penal sum of _____ dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bond ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and provisions in the said Contract and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Manteca, its officers, agents and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

ATTACHMENT 3

In witness whereof, this instrument has been duly executed by the Contractor and surety above named, on _____, 20____.

Name of Contractor

Name of Surety

Address

Address and Telephone

Signature of Contractor

Signature of Surety

APPROVED AS TO FORM:

APPROVED AS TO SUFFICIENCY:

Riana Daniel, Interim City Attorney

Kevin Jorgensen II, Director of Engineering

Attach Notary Form Here

*** END OF SECTION ***

EXHIBIT “U”

Workers' Compensation Insurance

Section 00650
WORKER' COMPENSATION INSURANCE

SECTION 00650
WORKERS' COMPENSATION INSURANCE

In accordance with California Labor Code Section 1861, prior to commencement of work on the Contract, the Contractor shall sign and file with the City the following certification:

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

Carl Overaa

Signature

C. Overaa & Co.

Name of Contractor

President

Title

5/20/25

Date

END OF SECTION

EXHIBIT “V”

Insurance and Indemnification Documents

EXHIBIT “W”

Project Preliminary Design Report



Manteca WQCF Sidestream Treatment and UV Rehabilitation Preliminary Design



Sidestream Treatment and UV Rehabilitation Preliminary Design Report

FINAL / October 2025



Manteca WQCF Sidestream Treatment and UV Rehabilitation Preliminary Design

Sidestream Treatment and UV Rehabilitation Preliminary Design Report

FINAL / October 2025

Digitally signed by Stephen Caswell
Contact Info: Carollo Engineers, Inc.
Date: 2025.10.08 10:00:00 -0700



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Abbreviations

2012 NWRI *UV Guidelines* National Water Research Institute *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (Third Edition, August 2012)

AA	annual average
AA	aeration air (process pipe abbreviation)
AACE	Association for the Advancement of Cost Engineering
AAF	average annual flow
ADWF	average dry weather flow
annamox	anaerobic ammonia oxidizing
AOB	ammonia oxidizing bacteria
BOD	biochemical oxygen demand
BOD ₅	5-day biochemical oxygen demand
C	Celsius
CaCO ₃	calcium carbonate
CaRRB	centrate and RAS reaeration basin
Carollo	Carollo Engineers, Inc.
City	City of Manteca
COD	chemical oxygen demand
DAFT	dissolved air floatation thickeners
DO	dissolved oxygen
EI&C	electrical, instrumentation, and control
EQ	equalization
gpd	gallons per day
HEX	heat exchanger
hp	horsepower
IFAS	integrated fixed-film activated sludge
KCMil	kilo circular mils
kVA	kilovolt-amperes
kW	kilowatts
kWh	kilowatt-hour
lb	pounds
lb/day	pounds per day
<i>Master Plan</i>	<i>Wastewater Master Plan</i>
MCC	motor control center
mgd	million gallons per day
mg/L	milligrams per liter
Mg(OH) ₂	magnesium hydroxide
mJ/cm ²	millijoules per square centimeter

MLE	Modified Ludzack Ettinger
MM	maximum month
mm	millimeter
MMF	maximum monthly flow
MPN/100 mL	most probable number per 100 milliliters
MS2	bacteriophage MS2
NEC	National Electric Code
NH ₃	ammonia
NO ₃ +NO ₂	nitrate plus nitrite
NOB	nitrite oxidizing bacteria
NPDES	National Pollutant Discharge Elimination System
NPV	net present value
O&M	operations and maintenance
PAD	post aerobic digestion
PDC	power distribution center
<i>PDR</i>	<i>Sidestream Treatment and UV Rehabilitation Preliminary Design Report</i>
PLC	programmable logic controller
PO ₄ -P	orthophosphate as phosphorus
RAS	return activated sludge
RDT	rotary drum thickeners
RED	reduction equivalent dose
scfm	standard cubic feet per minute
Suppliers	Three UV manufacturers (Trojan UVSigna (2-Row); Wedeco, a Xylem brand, Duron; and Veolia Aquaray HiCAP)
SWD	side water depth
TDC	total direct cost
TIN	total inorganic nitrogen
TKN	total Kjeldahl nitrogen
TSS	total suspended solids
US	United States
UV	ultraviolet
UVT	ultraviolet transmittance
V	volts
Veolia	Veolia Water Technologies
VSR	volatile solids reduction
W	watts
WAS	waste activated sludge
WQCF	wastewater quality control facility

SECTION 1 INTRODUCTION

1.1 Background

The Manteca Wastewater Quality Control Facility (WQCF) began operation in 1959. The last major expansion was completed in 2008 which made the facility a Title 22 tertiary treatment facility. Since then, the WQCF's National Pollutant Discharge Elimination System (NPDES) permit (CA0081558 Order R5-2021-0003) was modified to include nitrogen limits and the facility has seen increased influent pollutant concentrations due largely in part to new water conservation regulations. The City of Manteca (City) continues to see sustained growth which in turn is projected to continually increase the flows and loads to the WQCF. In an effort to address the changed conditions, the City completed a *Wastewater Master Plan (Master Plan)* in February 2024. This 2024 *Master Plan* highlighted several approaches to address performance, capacity and nutrient limitations including upgrading the existing ultraviolet (UV) disinfection system and implementing sidestream treatment of centrate return flows.

1.2 Purpose

This *Sidestream Treatment and UV Rehabilitation Preliminary Design Report (PDR)* provides:

- Flows and loadings assumptions for the sidestream treatment facility.
- A screening of available sidestream treatment technologies.
- An evaluation of two sidestream treatment technologies.
- An overview of the existing UV disinfection facility.
- Overall design criteria for the new UV system.
- An evaluation of three manufacturers for UV replacement.
- An evaluation of a retrofit of the existing UV system versus a new facility.
- Recommendations on project elements to be included in the final design of the UV and sidestream treatment facilities.

SECTION 2 SIDESTREAM TREATMENT ALTERNATIVES EVALUATION AND PRELIMINARY DESIGN

2.1 Existing Facilities Description

2.1.1 Process Overview

Wastewater enters the plant through an influent pump station located along the easterly perimeter of the WQCF. The influent pump station splits the wastewater flow to parallel treatment systems known as the north side and south side facilities. Both north side and south side provide preliminary, primary, and secondary treatment.

Preliminary and primary treatment facilities include headworks, influent pumping station, aerated grit removal tanks, and primary sedimentation tanks.

Secondary treatment facilities include conventional activated sludge system with aeration basins, secondary clarifiers, return activated sludge (RAS) and waste activated sludge (WAS) pumping stations, and secondary effluent equalization (EQ) pond. Following the secondary treatment, undisinfected secondary effluent from either north side or south side can be used to irrigate City-owned land or routed to the tertiary facilities.

Tertiary facilities are located on the west side and include filter feed pump station, rapid mix and flocculation basins, cloth media filters, and UV disinfection facility. Effluent handling and disposal facilities include secondary effluent storage pond, irrigation pump station, on-site land application areas for crop irrigation, effluent outfall to the San Joaquin River.

Primary sludge and WAS are conveyed to solids handling facilities located on the north side. Solids handling facilities include dissolved air floatation thickeners (DAFT), anaerobic digesters, and centrifuge dewatering. A project is underway to replace the DAFTs with rotary drum thickeners (RDT) that will co-thicken primary sludge and WAS. Centrate from the dewatering process, referred to as sidestream, is routed by gravity to the influent pump station.

A process flow diagram of the City's WQCF is shown in Figure 1 taken from the 2024 *Master Plan* (Courtesy: Stantec).

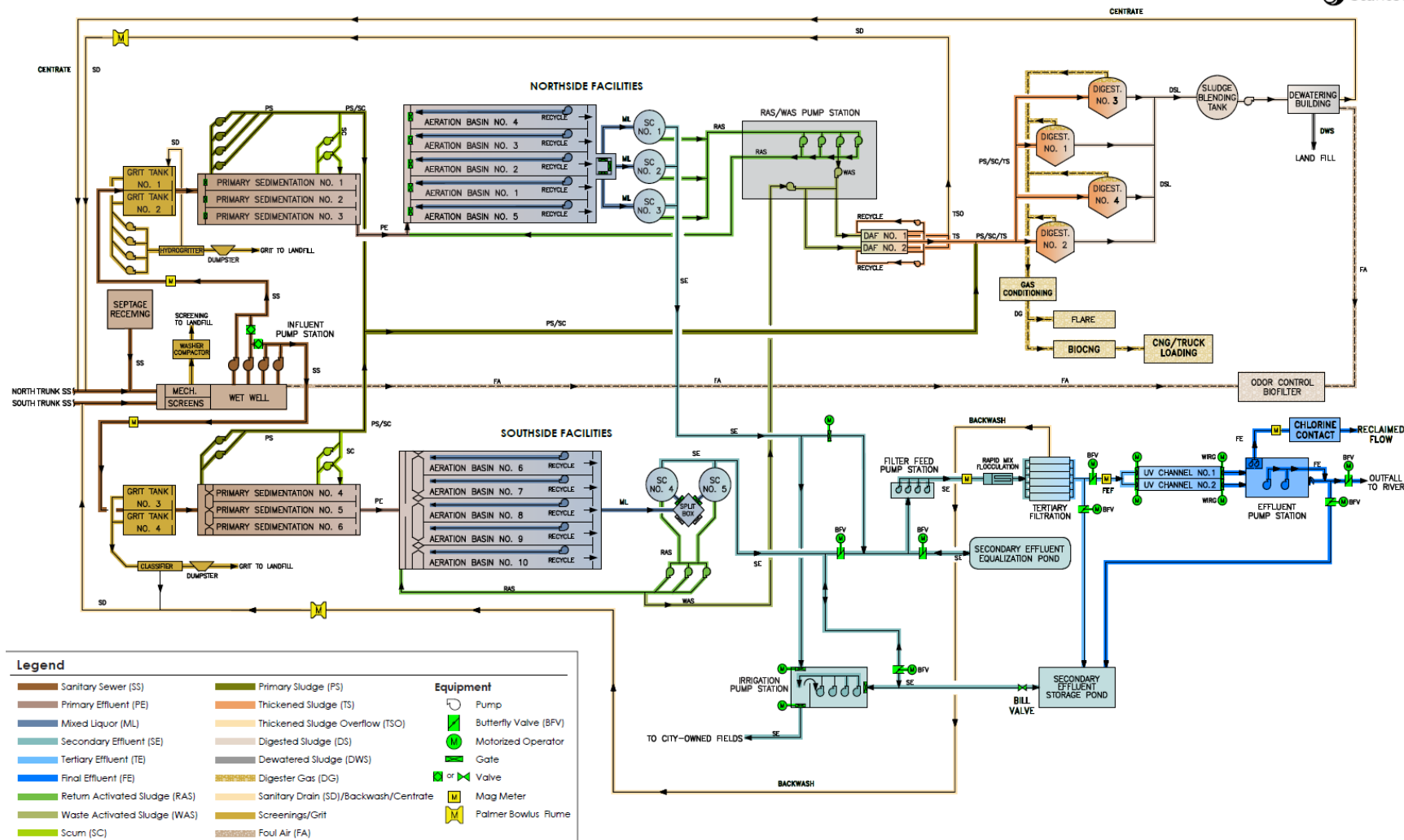


Figure 1 Manteca WQCF Process Flow Schematic (2024 Master Plan; Courtesy: Stantec)

2.1.2 Effluent Targets and Performance

The City's WQCF is currently regulated by the NPDES permit CA0081558 Order R5-2021-0003. This order serves as Waste Discharge Requirements pursuant to the California Water Code (Section 13260) and Federal Clean Water Act (Section 402). NPDES orders are renewed over a five-year cycle to reflect changes in policy, interpretation, updates to regulation and policy regarding the disposal of wastewater, variations in effluent quality, and public input. The current order became effective on April 1, 2021, and expires on March 31, 2026.

Table 1 describes key effluent limitations for discharge to the San Joaquin River. As seen in Table 1, the City's WQCF is required to meet ammonia (NH₃) and nitrate plus nitrite (NO₃+NO₂) limits year-round.

Table 1 Key Effluent Limitations for Discharge to San Joaquin River

Constituent	Value
BOD ₅ , mg/L	
Monthly Average	10
Weekly Average	15
TSS, mg/L	
Monthly Average	10
Weekly Average	15
NH ₃ , mg/L(1)	
April 1st to November 30th	
Monthly Average	2.0
Weekly Average	4.2
December 1st to March 31st	
Monthly Average	2.5
Weekly Average	6.2
NO ₃ +NO ₂ , mg/L	
Monthly Average	10
Weekly Average	15.3

Notes:

BOD₅ – 5-day biochemical oxygen demand at 20 degrees C; mg/L – milligrams per liter; TSS – total suspended solids.

(1) Loading Limits for NH₃ are regulated based on the average dry weather flow (ADWF).

Figure 2 shows the NH₃ and NO₃+NO₂ concentrations from 2019 through 2024. As seen in Figure 2, monthly average limits for NH₃ and NO₃+NO₂ mg/L are in compliance most of the time, however, the plant does not always fully nitrify, particularly in the winter, due to capacity limitations. Figure 3 shows the effluent NH₃ load from 2019 to 2024 compared to the load-based NH₃ limits. The plant occasionally fails to meet NH₃ load limits. Based on the 2024 *Master Plan*, the City has plans to upgrade their secondary process from Modified Ludzack Ettinger (MLE) to Bardenpho which will reduce the effluent NH₃ and NO₃+NO₂ concentrations. Additionally, the City has plans to design a membrane bioreactor train in the next few years, which would increase the overall plant capacity and improve the reliability to meet effluent nitrogen limits. In addition to these efforts, the City contracted Carollo Engineers, Inc. (Carollo) to conduct

an evaluation to implement a sidestream treatment technology that would reduce the nitrogen loads that are returned to the headworks from the dewatering centrate. While the sidestream treatment process will reduce the NH_3 loads returned to the mainstream process and in turn reduce effluent nitrogen loads, the plant-wide benefit of sidestream treatment has not been quantified as part of this project since there are several concurrent ongoing efforts that would affect plant performance.

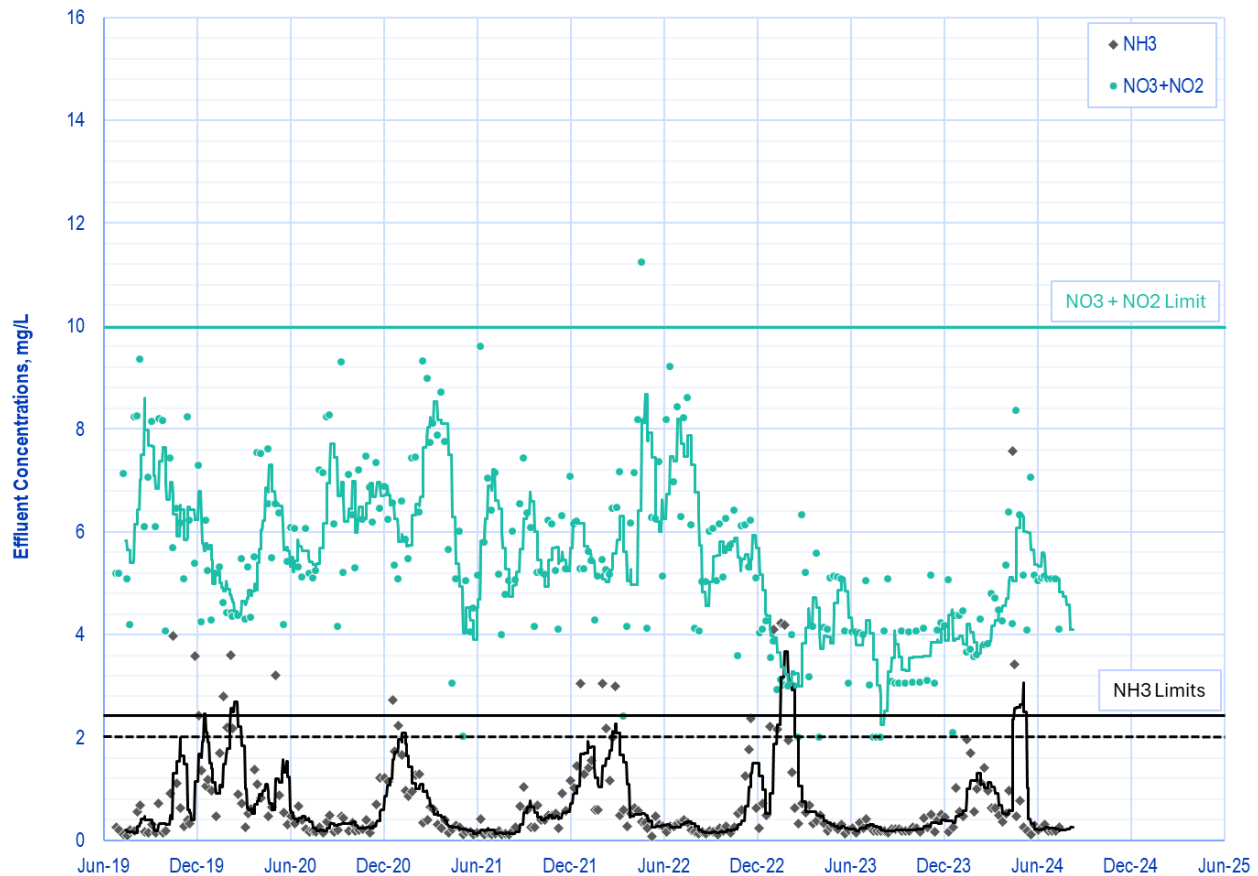


Figure 2 Historical Effluent NH_3 and $\text{NO}_3 + \text{NO}_2$ Concentrations

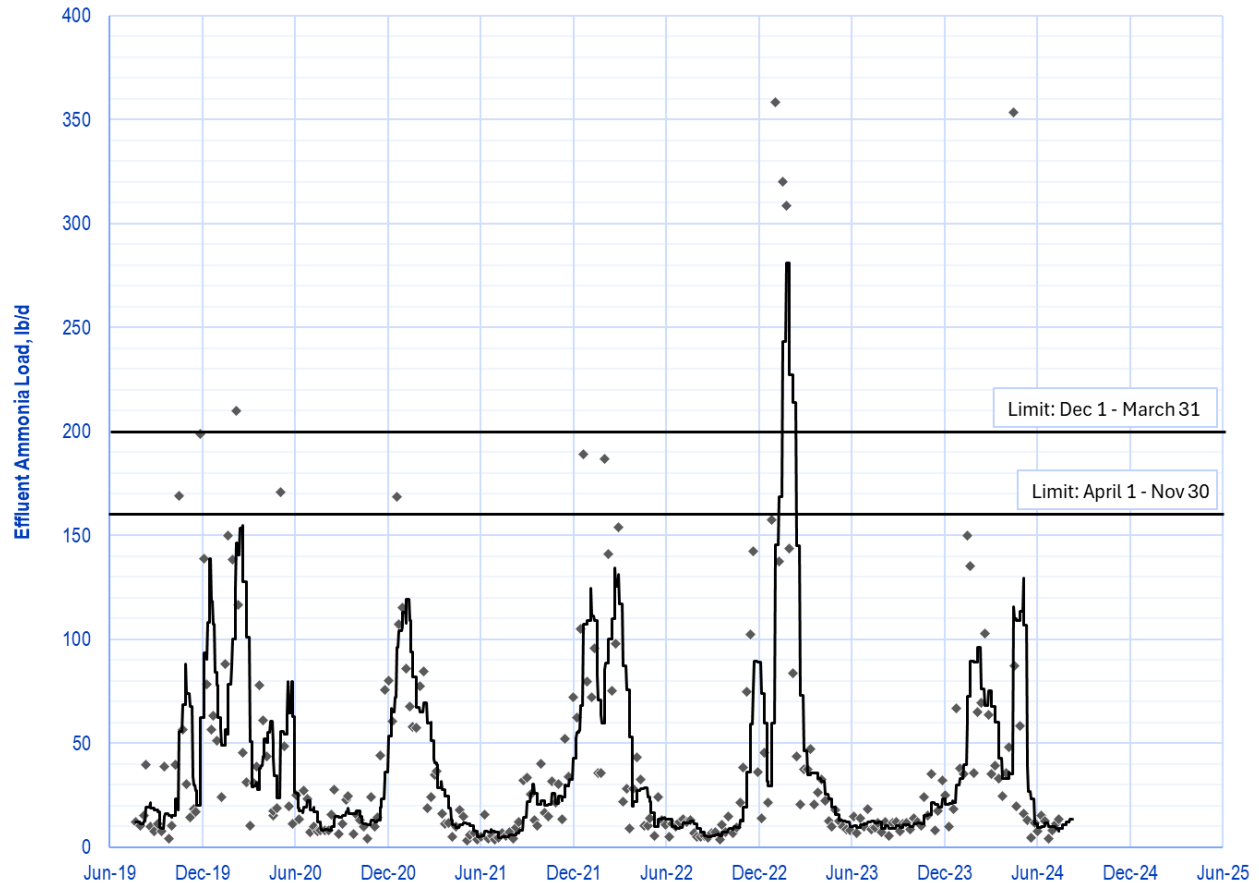


Figure 3 Historical Effluent NH₃ Loads

2.2 Flows and Loads

Historical influent and centrate data for the last five years were analyzed to determine the design flows and loads for the sidestream. The historical data were compared to the rated capacity with interim improvements and Phase IV Stage 1 projections developed in the 2024 *Master Plan*. The centrate flows for the interim and Phase IV Stage 1 conditions were linearly scaled from the influent flow projections. The centrate flows by gravity to the headworks and is not metered. It was assumed that the digested sludge metered flow rate is equal to the sidestream centrate flow rate. Centrate concentrations are analyzed weekly. The historical annual average (AA) sidestream flow makes up about 1 percent of the influent flow but comprises roughly 14 percent of the influent total Kjeldahl nitrogen (TKN) loads. The current maximum month (MM) TKN and NH₃ loads were calculated from the daily flows and weekly concentrations.

Table 2 compares the influent and centrate flows and loads at various capacities. As seen in Table 2, the current influent flows are only 12 percent lower than the rated capacity flows with interim improvements. Based on the flow projection from the 2024 *Master Plan*, the City's WQCF can potentially reach flows of 8.2 million gallons per day (mgd) around 2030. Designing the sidestream treatment process around the rated capacity flows does not provide enough flexibility and capacity for future flows. Therefore, Phase IV Stage 1 conditions were used to develop design criteria for the sidestream treatment process.

Table 2 Summary of Influent and Centrate Flows and Loads

Parameter	Historical Data (2019 – 2024)	Rated Capacity (Interim Improvements)	Phase IV Stage 1
Influent			
ADWF without recycle, mgd	7.2	8.2	12.89
AA TKN, lb/day ⁽³⁾	4,203	4,612	7,224
Centrate⁽¹⁾			
AAF ⁽²⁾ , mgd	0.0719	0.0821	0.1286
MMF, mgd	0.0811	0.0926	0.1450
MMF/AAF Peaking Factor	1.13	1.13	1.13
MM TKN, mg/L	893	893	893
MM TKN, lb/day	604	690	1,080
MM NH ₃ , mg/L	798	798	798
MM NH ₃ , lb/day	540	616	965

Notes:

AAF – average annual flow; lb/day – pounds per day; MMF – maximum monthly flow.

(1) Centrate flow and load does not include food waste.

(2) Centrate flow is not metered and drains by gravity to the headworks. It is assumed that the centrate flow are equal to the digested sludge flow.

(3) lb/day = mg/L * mgd * 8.34.

2.3 Alternatives Screening

Several processes have been developed to remove nitrogen in the sidestream from biosolids processing. The first sidestream treatment installations in the world occurred in the last 20 years and have continued to grow in the municipal wastewater treatment market. There are at least 250 installations worldwide with many having proven reliability. The most common sidestream technologies are biological processes, which can be categorized as follows:

- Nitrification/denitrification and bioaugmentation.
- Nitritation/denitritation.
- Post aerobic digestion (PAD).
- Partial nitritation/deammonification.

There are other physical/chemical sidestream treatment processes which were not considered for this project because they either don't achieve the same level of nitrogen removal as biological processes or they are not proven at full scale in the municipal wastewater market.

2.3.1 Bioaugmentation

Bioaugmentation, although not as widely implemented as deammonification, is the simplest sidestream treatment process because it utilizes conventional nitrification and denitrification pathways, similar to mainstream nitrogen removal processes. Bioaugmentation combines sidestream and RAS in a reactor. The bacteria cultivated in bioaugmentation processes are the same ammonia oxidizing bacteria (AOB) and nitrite oxidizing bacteria (NOB) which are cultivated in the aeration basins in the secondary process. The

AOB are responsible for converting NH_3 to NO_2 (nitrification) and the NOB bacteria are responsible for converting NO_2 to NO_3 (denitrification). Figure 4 shows the nitrification and denitrification pathways for conventional nitrogen removal. There are many bioaugmentation configurations, some including internal mixed liquor recirculation and secondary clarifiers just as in mainstream nutrient removal facilities. A less complicated approach, and the one considered for this evaluation, is to utilize a configuration that has been identified as centrate and RAS reaeration basin (CaRRB).

Fundamentals of Nitrification – Denitrification

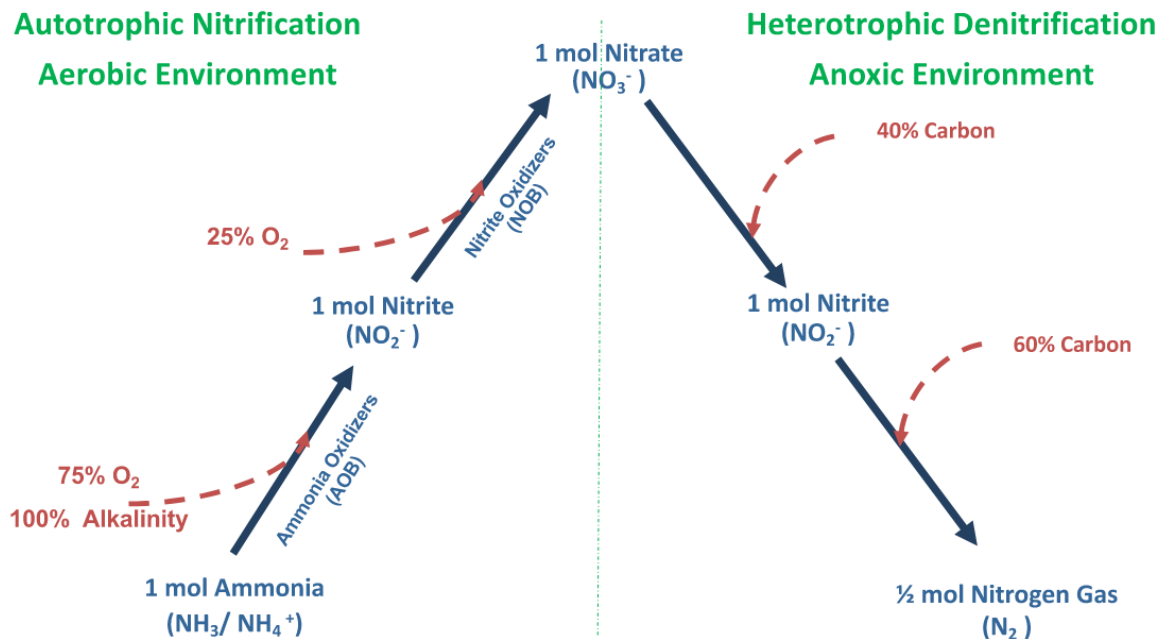


Figure 4 Nitrification/Denitrification Pathways

CaRRB is usually configured as an aeration basin with an anoxic swing zone that operates similarly to a mainstream process. The mixed liquor in CaRRB is higher than in the mainstream because most (or all) of the RAS is fed to the reactor and little dilution is achieved with the small volume of sidestream that is also fed to the reactor. The process can comfortably be operated at the high mixed liquor concentrations since effluent is fed to the mainstream and need not go through a settling or solids separation step.

In the CaRRB reactor, nitrifiers (AOBs and NOBs) are being grown at a faster rate than they are in the mainstream because NH_3 concentrations are higher due to the centrate. Nitrifiers grown in the CaRRB reactor are then seeding nitrifying bacteria into the mainstream, which creates a more robust process. Having additional aeration basin volume as part of the secondary process allows for the process to potentially operate at a lower solids retention time or lower mixed liquor recycle rates. The RAS provides alkalinity to buffer against pH drops during nitrification and also provides a small amount of carbon to be able to partially denitrify. Depending on the RAS and centrate flow rates and characteristics and the tank size, CaRRB can be modified to achieve denitrification through the use of an anoxic zone. This further improves the robustness of the process by achieving partial nitrogen removal before entering the mainstream process. The anoxic zone in the CaRRB basin also ensures that the feed into the anoxic zone of the mainstream does not receive too much oxygen, which would inhibit denitrification. Figure 5 shows the process flow diagram for CaRRB.

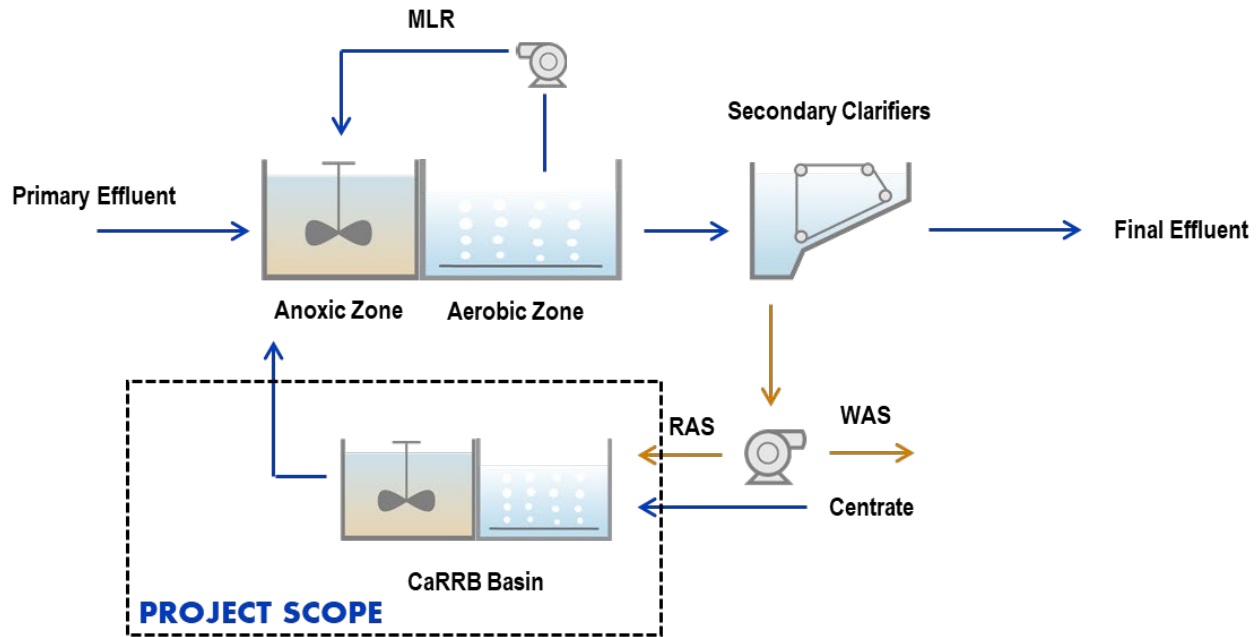


Figure 5 CaRRB Process Flow Schematic

CaRRB was considered during the initial screening, however the full benefit of CaRRB can only be realized if the process receives RAS from both trains. Since the WQCF has two parallel treatment systems (north and south side) and is adding a third treatment system, there will be three separate sludges. With a separate sludge in the future, implementation of CaRRB will be difficult from both a piping and process standpoint. Complicated RAS splitters would be needed to portion the treated RAS back to the north and south facilities. Additionally, the pipe routing between the facilities is congested and would be difficult to construct. Furthermore, the CaRRB system will require a supplemental carbon source if full denitrification is desired. The WQCF currently doses MicroC® as an additional carbon source to help achieve denitrification and is also planning on converting the existing MLE trains to Bardenpho. The Bardenpho conversion will further increase the supplemental carbon demand. Although CaRRB is simple to operate and has the potential to provide synergistic benefits to improve effluent quality and plant performance, the complicated implementation and additional carbon demand concluded that CaRRB is not the most practical alternative and was not considered for further evaluation.

2.3.2 Nitritation/Denitritation

Nitritation is a “short-cut” nitrogen removal process where NH_3 is converted to NO_2 (and not NO_3) prior to the denitrification step. While nitritation has some advantages compared to the conventional nitrification and denitrification, primarily reduced aeration demand, nitritation alone is not recommended for further consideration because it is difficult to reliably and stably accumulate NO_2 without further nitrifying to NO_3 . Additionally, denitrification requires carbon. Also, there are very few if any full scale successfully operating nitritation/denitritation facilities.

2.3.3 PAD

PAD is a process that integrates an aerobic digestion step after anaerobic digestion to reduce nitrogen levels in the sidestream. The addition of the aerobic digestion step allows the breakdown of solids waste further. Research has shown that certain organic compounds in sludge digestion can only be degraded under aerobic conditions and therefore, addition of the PAD step allows for additional volatile solids reduction (VSR) of about 10 to 30 percent.

The PAD process can achieve both aerobic and anoxic conditions inside the same reactor which facilitates both nitrification and denitrification inside the reactor. The PAD process can remove about 60 to 80 percent of NH_3 and reduces the chance of struvite scaling in dewatering processes. Figure 6 shows a typical process flow diagram for PAD.

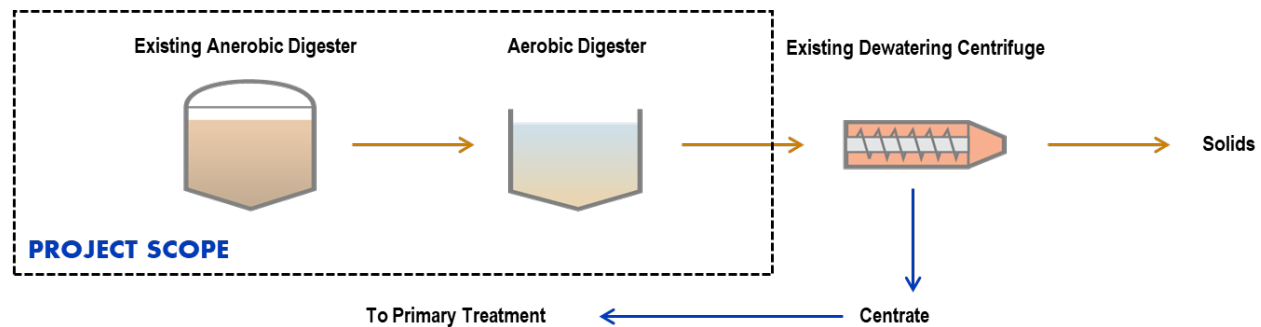


Figure 6 PAD Process Flow Schematic

PAD requires a retention time of six to eight days which would result in a significantly large tank volume compared to other sidestream technologies. Additionally, PAD can have foaming issues and consumes alkalinity and carbon. Process performance is not higher or more stable than deammonification. Although the PAD process has its own benefits such as additional VSR reduction, it is best fit as a retrofit for a facility that has existing tanks of sufficient size available to be converted to PAD. The City's WQCF does not have any existing tanks that could be utilized for retrofitting the PAD process. Therefore, it was concluded that the PAD process will not be a feasible alternative and hence it was not considered for further evaluation.

2.3.4 Partial Nitritation/Deammonification

Deammonification is becoming one of the most common sidestream treatment processes. Under conventional nitrogen removal processes, NH_3 is converted to NO_2 under aerobic conditions (nitrification) and NO_3 is converted to nitrogen gas under anoxic conditions (denitrification). Deammonification shortcuts the nitrogen cycle by converting NH_3 and NO_2 to nitrogen gas. In the first step, half of the NH_3 is converted to NO_2 by AOBs. In the second step, the remaining NH_3 and NO_2 are converted to nitrogen gas by anaerobic ammonia oxidizing (anammox) bacteria. Figure 7 shows the nitritation and deammonification pathways.

Fundamentals of Deammonification

Aerobic Ammonium Oxidation AerAOB

Anaerobic Ammonium Oxidation Anammox or AnAOB

- > 60% reduction in Oxygen / Energy
- Eliminate demand for supplemental carbon
- 50% of the alkalinity demand

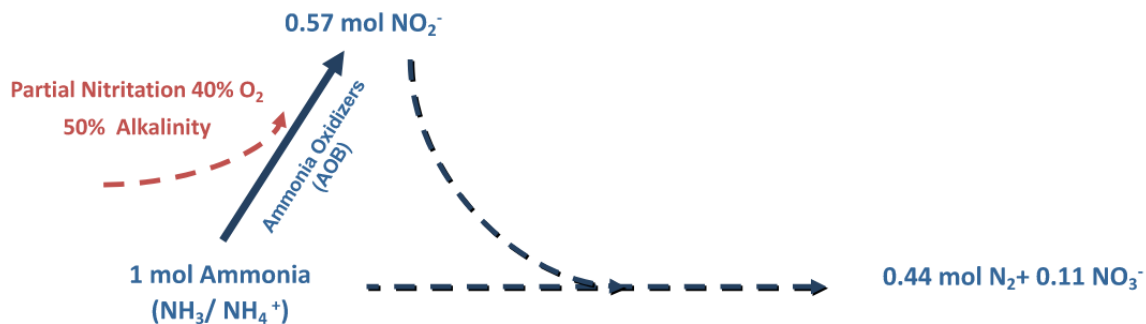


Figure 7 Nitritation/Deammonification Pathways

Deammonification technologies take advantage of the high NH_3 concentration and warm water temperature from anaerobic digestion to achieve nitrogen reduction in a smaller footprint with less aeration than would be required in the mainstream. Additionally, deammonification technologies also reduce the requirement for alkalinity and supplemental carbon by approximately 50 and 100 percent, respectively.

There are several different deammonification technologies, however, each of the technology utilizes annamox bacteria for the second step. Annamox bacteria have a very slow growth rate, and therefore, has a long start up period. To shorten the start-up period, each process is inoculated with annamox bacteria from a facility with the same process. Annamox are a genus of bacteria, and the individual species varies by process. The main difference between the different technology providers is how the environment to cultivate annamox bacteria is provided, how the process is controlled, and how the slow growing biomass is retained in the system.

Annamox bacteria require fine-tuned control of the operating conditions to ensure proper nitrogen removal. Alkalinity, dissolved oxygen (DO), pH, NH_3 , NO_2 , and NO_3 are frequently monitored to control the performance. Depending on the alkalinity available in the sidestream, deammonification processes typically achieve 80 percent NH_3 removal, and 70 to 80 percent total inorganic nitrogen (TIN) removal, which is the sum of NH_3 , NO_2 , and NO_3 .

Although the deammonification processes are capable of receiving flow intermittently, they perform better when flow is sent to the reactor continuously. If dewatering is not performed continuously (24/7), an EQ tank should be provided between dewatering and the sidestream treatment to allow operational flexibility while maintaining a consistent feed flow rate to the process. Even if dewatering is performed continuously, a smaller EQ tank is still recommended to attenuate any variations in feed loads so that the

anammox bacteria receive consistent influent water quality to maximize performance. Fine or coarse bubble diffusers mounted to the bottom of the tank provide aeration. Mixing is also required and is achieved by mixers or aeration diffusers.

The three deammonification technologies evaluated account for roughly 95 percent of deammonification installations worldwide. The following sections discuss the differences between the technologies evaluated.

2.3.4.1 AnammoPAQ®

AnammoPAQ® has over 60 installations worldwide and is more common in the industrial market but also has installations in the municipal market. However, currently there is only one full-scale installation in the United States (US). Because it only has one installation and is not as proven in the US, it was not evaluated in detail for this project.

The process is a continuously mixed reactor with mixing provided by continuous fine bubble aeration. The anammox bacteria grow as dense granules about 1.5 millimeters (mm) in diameter. A separator in the middle of the reactor continuously overflows, where the dense solids settle back into the reactor and the treated effluent leaves the process. Figure 8 shows the process flow diagram for AnammoPAQ®. Since there is only one full-scale installation in the US, this alternative was screened out and not considered for further evaluation.

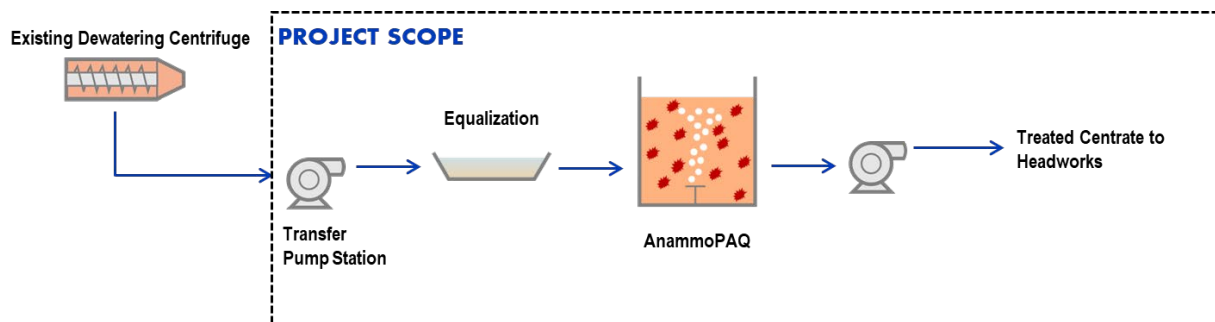


Figure 8 AnammoPAQ® Process Flow Schematic

2.3.4.2 ANITA™ MOX

ANITA™ Mox is a moving bed biofilm reactor process offered by Veolia Water Technologies (Veolia) and has about 35 installations worldwide with at least 10 installations in the US. It is different from the other deammonification technologies in that the biomass is grown on a suspended virgin polyethylene plastic media, which has a large surface area to volume ratio. The media fills up to 50 percent of the reactor volume. The reactors are continuously mixed by aeration and continuously aerated with medium bubble diffusers. Mesh screens on the outlet of the reactor retain the biomass-covered plastic media. Anammox can occasionally slough off the media, but given the slow growth of the bacteria there is little to no waste sludge. Sloughed biomass is sent out with effluent. Figure 9 shows the process flow diagram for ANITA™ Mox process based on a flow through reactor configuration. This process could also be modified to operate in an integrated fixed-film activated sludge (IFAS) configuration where there is a suspended biomass component that is captured and returned with downstream clarifiers. The IFAS configuration requires additional equipment, footprint, and operational complexity and is only recommended when

conditions necessitate, such as at plants with thermal hydrolysis process digestion or very high loads of external food waste. Treated sidestream is then routed by gravity or pumped to the secondary process or headworks.

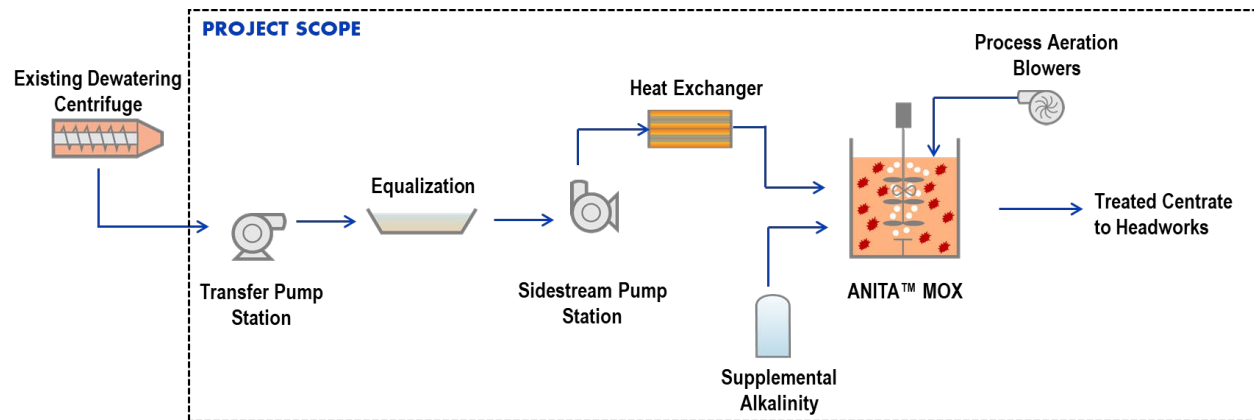


Figure 9 ANITA™ Mox Process Flow Schematic

2.3.4.3 DEMON®

DEMON® is a suspended growth process offered by World Water Works, Inc. and is the most common sidestream deammonification process, accounting for about half of all installations. There are about 92 installations worldwide with at least 8 in the US. DEMON® 1.0 operates as a sequencing batch reactor, however, DEMON® 2.0 is a continuous flow through process. The process monitors alkalinity, pH, NH_3 , and NO_2 . Aeration is cycled on and off based on pH setpoints to cycle between aerobic and anoxic conditions. An internal recycle pump continuously recirculates flow from the reactor through a microscreen. The microscreen wastes lighter, or flocculant AOB and NOB, while denser anammox granules are retained and routed back into the reactor. Anammox granules are roughly 0.5 mm in diameter. Effluent from the process continually overflows an internal settling zone that retains anammox granules. Treated sidestream is then routed by gravity or pumped to the secondary process or headworks. Figure 10 shows the process flow diagram for DEMON.

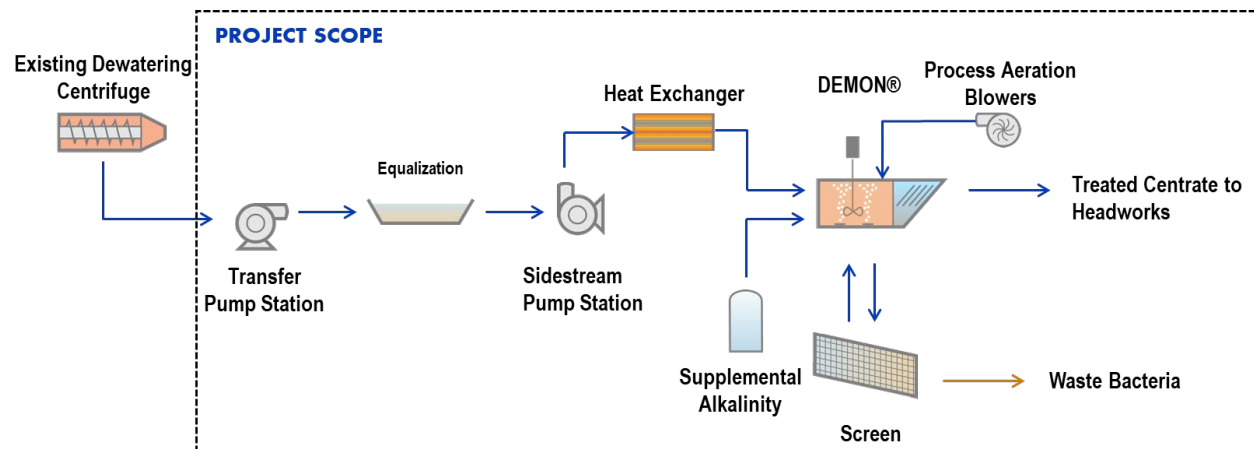


Figure 10 DEMON® Process Flow Schematic

2.4 Alternatives Evaluation

2.4.1 Evaluation Approach

Based on the rough screening of alternatives, DEMON® and ANITA™ Mox were the two technologies that were decided to be carried forward for further evaluation. Both these technologies are similar since they follow the same partial nitrification/deammonification process using the anammox bacteria. Therefore, the design criteria, site layout, and process improvements are similar for both technologies.

The two processes will differ from each other on the basis of control strategies, process reactor components, and sludge management. The process reactor components for each technology are discussed below, as well as a financial comparison, and a non-financial process comparison.

The alternatives evaluation included the development of the following components:

- Process flow diagrams.
- Conceptual site layout.
- Additional process improvements required.
- Capital, operations and maintenance (O&M), and life cycle costs.
- Process comparison.

2.4.2 Design Criteria

Table 3 lists the design average annual and max month centrate water quality. The max month values were provided to both technology providers to develop the proposed systems.

Table 3 Centrate Water Quality Criteria Comparison

Parameter	Average Annual Value	Max Month Value
Flow, mgd	0.129	0.145
BOD, mg/L	78	149
COD, mg/L	896	1,408
TSS, mg/L	188	524
TKN, mg/L	705	893
NH ₃ , mg/L	667	798
PO ₄ -P, mg/L	216	321
Alkalinity ⁽¹⁾ , mg/L	2,753	2,753

Notes:

BOD – biochemical oxygen demand; COD – chemical oxygen demand; PO₄-P – orthophosphate as phosphorus.

(1) Average annual alkalinity provided to vendors because it is limiting and changes seasonally. Assumed same as digested sludge alkalinity.

Table 4 compares the design criterion for both DEMON® and ANITA™ Mox technologies. As mentioned earlier, the differences in the design criteria are minimal. The ANITA™ Mox process reactor volume is about 10 percent smaller than the DEMON® process reactor. However, the ANITA™ Mox process has higher airflow demand and requires a bigger blower size. On the other hand, DEMON® provides a little better NH₃ and TIN removal but requires higher supplemental alkalinity.

Table 4 Design Criteria Comparison

Parameter	ANITA™ Mox	DEMON®
Number of Process Trains	1	1
Reactor Size, cubic feet	28 (Length) x 29 (Width) x 21 (SWD)	30 (Length) x 30 (Width) x 21 (SWD)
Reactor Volume, gallons	17,100	18,900
Airflow Demand, scfm	830	360
Blower Size, hp	60	50
NH ₃ Removal, %	85%	90%
TIN Removal, %	75%	80%
Additional Alkalinity Requirement, lb/day	864	1,057

Notes:

hp – horsepower; scfm – standard cubic feet per minute; SWD – side water depth.

2.4.3 Conceptual Site Layout

Figure 11 shows a conceptual site layout for both technologies. Since the approximate footprint requirement and process improvements were similar for both technologies, a single layout was developed. Key process components that are shown in the figure include:

- Centrate transfer pump station to pump centrate to EQ basin.
- Reactor feed pump station to feed the sidestream treatment reactor.
- Heat exchanger (HEX) to achieve ideal operating temperatures during the winter season.
- EQ basin to allow for operating stability.
- Process control building to house the new blowers and associated electrical equipment.
- Alkalinity addition facility to provide supplemental alkalinity to the sidestream treatment process.

The common process improvements are discussed in further detail in the following section.

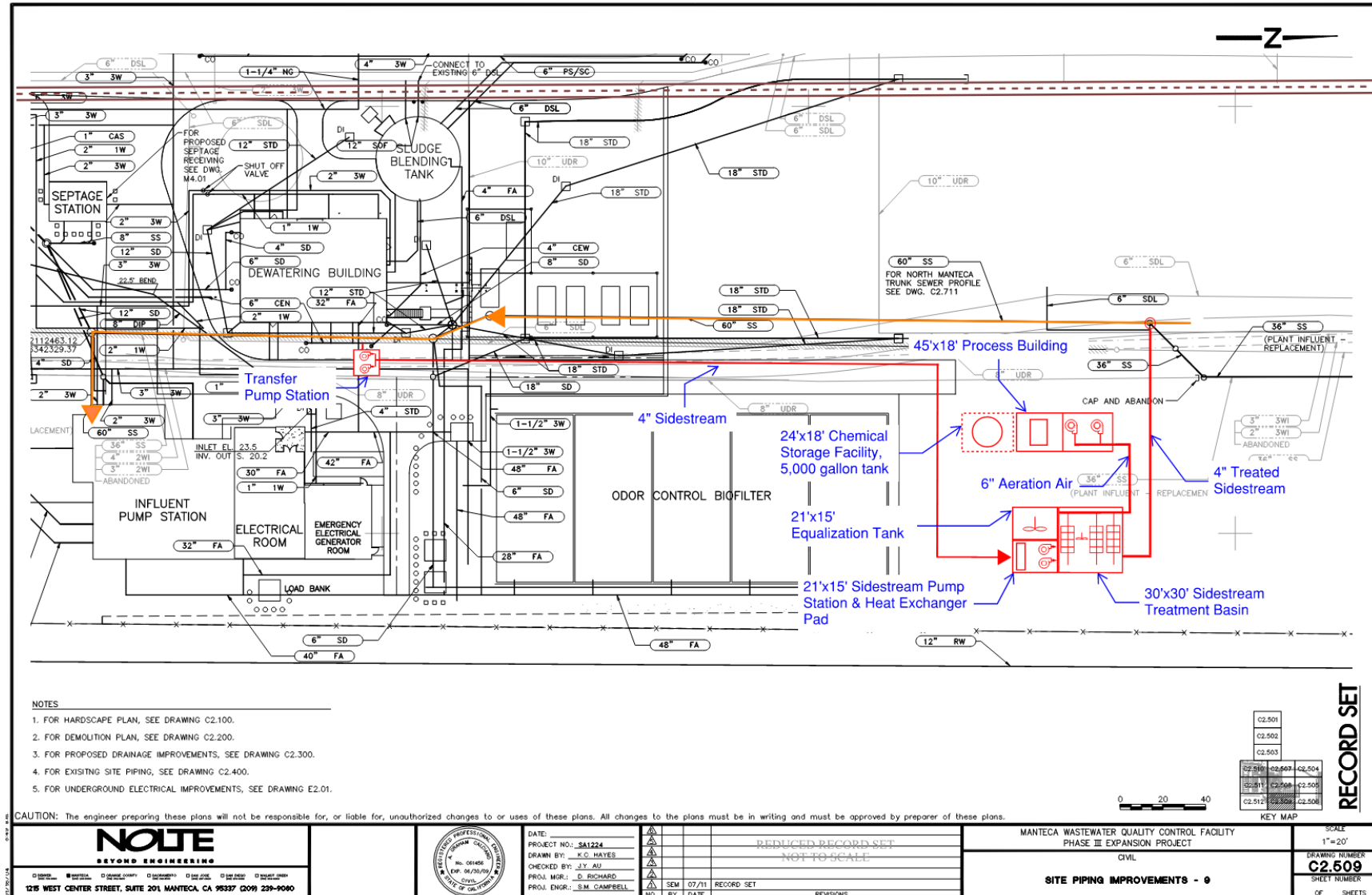


Figure 11 Conceptual Site Layout

2.4.4 Common Process Improvements

2.4.4.1 Subsurface Improvements

Carollo is currently designing solids handling improvements for the WQCF, including a co-thickening RDT facility. As part of that design project, the geotechnical evaluation determined that there is shallow groundwater (<20 feet) and liquifiable soils that cause substantial differential settlement. The current approach for that design project is to include subsurface improvements (rammed aggregate piers) below all new structures. It was assumed that rammed aggregate piers would also be needed below all new structures for this project. Costs for subsurface improvements for this project were scaled from quotes and cost estimates received for the solids improvement design project.

2.4.4.2 Centrate Transfer Pump Station

Centrate from each centrifuge exits the south side of the dewatering building, then combines with centrate waste after a centrifuge startup, and storm drain, then flows by gravity to the headworks. When a centrifuge starts up, the sludge fed to the centrifuge is wasted to the drain until the discharge pressure builds up to form a cake, then it is routed to the conveyor. This initial sludge wasted is referred to as slop and has very high solids concentration compared to typical centrate, roughly 2 to 3 percent total solids. Sending excess solids to the sidestream reactor can negatively affect performance by inhibiting anammox bacteria and encouraging NOB growth that outcompete anammox bacteria. Also, high influent solids concentrations create an additional oxygen demand that requires more energy usage.

Piping modifications are recommended to separate the centrate from the slop and storm drain. The piping can be intercepted on the south side of the dewatering building, without having to do any modifications inside the building. A centrate transfer pump station is recommended to feed the EQ basin. A precast wet well approximately 8 feet deep with two approximately 7.5 hp pumps would handle the centrate flows. The transfer pump station could include dual force mains for improved maintenance flexibility.

2.4.4.3 HEX

The ideal operating temperature for deammonification processes is between 30 and 35 degrees Celsius (C). The process performance starts to decrease below 30 degrees C as NOBs outcompete anammox bacteria at lower temperature. Additionally, if the temperature is higher than 35 degrees C, the anammox bacteria are stressed and will die off quickly. The WQCF has a sludge holding tank between digestion and dewatering that provides about one day of sludge storage. The City does not monitor dewatering feed or centrate temperature but the sludge holding tank is not covered and therefore, likely experiences substantial heat loss during the winter. It is assumed that the centrate temperature is frequently less than 30 degrees C during the winter. To maintain the ideal temperature between 30 and 35 degrees C, a HEX is recommended. The HEX will tie into the existing hot water system that feeds the digester heating loop to heat the sidestream reactor feed during the winter season when ambient temperatures cause the centrate temperature to drop below 25 degrees C. There are two main types of HEXs, spiral and tube-in-tube. It was assumed that a tube-in-tube HEX would be needed for this application because it is less susceptible to clogging from solids buildup or mineral buildup such as struvite. For preliminary sizing and costing, the heating capacity required was calculated for a 10-degree

temperature increase (20 to 30 degrees C). This results in a required heating capacity of 1.0 million British thermal units per hour. It was assumed that the plant has sufficient boiler capacity to heat these additional loads. The HEX type, heating demands, existing heating capacity, and hot water tie-in configuration should be evaluated in further detail during design of the new sidestream treatment process.

2.4.4.4 EQ Basin

An EQ basin is recommended with both treatment technologies. As described previously, adding EQ volume upstream of the reactor will provide benefits to the operations of the process by feeding a consistent feed water quality, resulting in more stable operating conditions and improved treatment performance. EQ volume is typically determined based on the plant's dewatering schedule and flow characteristics. The City's WQCF dewaterers continuously. Based on the centrate flows, an EQ basin of approximately 50,000 gallons is recommended which will provide storage for eight hours.

The EQ basin should be continually mixed to prevent solids deposition that could build up and eventually feed into the reactor and shock the system. DEMON® can handle influent TSS concentrations of around 500 mg/L and ANITA™ Mox can handle influent TSS concentrations of around 1,500 mg/L. The influent TSS did not raise concern, and neither technology provider recommended a pretreatment step. Mixing systems could include a submersible mixer, vertical impeller mixer, or bubble mixing. The mixer should consider the minimum submergence required and how that would affect flow variability and resulting level in the EQ tank. Mixing systems should be evaluated in further detail as part of the design of the facility.

2.4.4.5 Reactor Feed Pump Station

A separate pump station is needed to pump flow from the EQ basin into the reactor. Since the EQ basin is fed from the centrate transfer pump station, the EQ basin can be located at grade with a similar top of concrete elevation as the reactor. Then, the reactor feed pump station could be a dry pit submersible pump station at grade. A dry pit pump station would allow for easier access and maintenance of equipment. Additionally, the pumps could be rotary lobe, which have a slower rotational speed than centrifugal pumps, reducing the potential for struvite buildup within the pump enclosure. During winter months, the pump would route flow through the HEX, located on the same pad as the pump station, before feeding the reactor. The pump station would have one duty and one standby pump, both approximately 7.5 hp.

2.4.4.6 Process Control Building and Electrical Strategy

A new process control building will be required to house the blowers for the sidestream process and associated electrical equipment. The blower room will have an approximate footprint of 20 feet by 25 feet and the electrical room will have an approximate footprint of 20 feet by 16 feet. The blower room will include two (1+1) 50 or 60 hp positive displacement blowers. Positive displacement blowers are preferred because the air demand is outside the typical range for other blower types like centrifugal or high-speed turbo blowers.

The electrical and control room will house the process programmable logic controller (PLC), panelboards, motor control centers (MCC), and variable frequency drives for the pumps and mixers. The building will be constructed of concrete masonry unit blocks to match existing plant infrastructure.

The dewatering building is currently the only facility where the power is not tied in to backup power. Since this project will be fed with power from the dewatering building, the plant would like to put the dewatering building, and therefore the sidestream process, on backup power. This requires rerouting wiring from a switchboard in the influent pump station electrical building to upstream of the transfer switch. The project will not increase the generator capacity and assumes that the existing backup power is sufficient for the plant needs, including the new loads for dewatering and sidestream processes, with the expectation that the centrifuges will not be operated on backup power.

A 480-volt (V) power and new duct bank will run from the switchboard in dewatering building to the new electrical room at the project site. Based on preliminary discussions, there is sufficient spare capacity in the dewatering building switchboard to power anticipated loads for this project which is approximately 200 hp. However, future sidestream expansions would likely need to get power from another source such as the influent pump station electrical building.

2.4.4.7 Alkalinity Addition

The amount of alkalinity needed is a function of the alkalinity in the feed stream and NH_3 removal rates. Based on the recent centrate alkalinity data collected at the City's WQCF, the average alkalinity in the centrate stream is approximately 2,200 mg/L as shown in Figure 12. The drinking water source for the City changes seasonally, which affects the alkalinity concentrations in the wastewater.

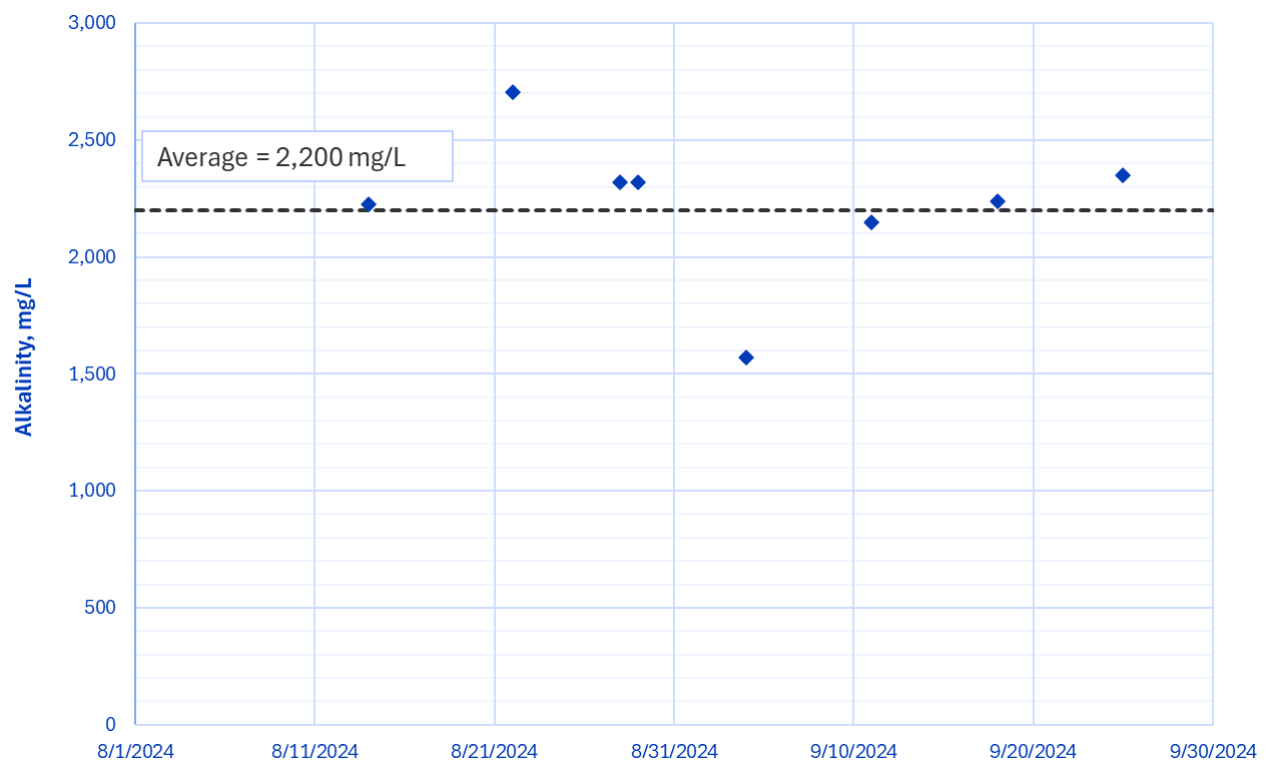


Figure 12 Centrate Alkalinity

The available centrate alkalinity (~2,200 mg/L) is insufficient to achieve the desired NH₃ removal (80 – 90 percent) for both deammonification technologies. Therefore, alkalinity addition to the sidestream process is recommended. For the deammonification process. Approximately four parts of alkalinity is consumed during the nitrification process for every one part of NH₃ removed. In order to sustain reliable nitrification for the deammonification, it is typically recommended to target about 200 mg/L in the sidestream treated effluent. Table 5 shows the amount of additional alkalinity required for both technologies.

Table 5 Additional Alkalinity Required

Parameter	ANITA™ Mox	DEMON®
Centrate		
Flow, mgd	0.145	0.145
NH ₃ , mg/L	798	798
Alkalinity ⁽¹⁾ , mg/L	2,200	2,200
Alkalinity consumed by nitrification, mg/L	2,715 ⁽²⁾	2,874 ⁽³⁾
Additional alkalinity required, mg/L	715	874
Additional alkalinity required, lb/day	671	1,057
Lb of CaCO ₃ /gallons for lime ⁽⁴⁾	4.7	4.7
Alkalinity feed flow, gpd	184	225

Notes:

CaCO₃ – calcium carbonate; gpd – gallons per day; lb – pounds.

(1) Based on recent centrate data collected by City in August and September of 2024.

(2) Based on 85 percent NH₃ removal.

(3) Based on 90 percent NH₃ removal.

(4) Hydrated lime slurry is 34 percent solids.

There is a range of chemicals available for adding alkalinity to a sidestream treatment process. However, due to the City's discharge requirements for TDS, chemicals that contain sodium are not recommended. This eliminates common alkalinity adding chemicals such as caustic soda (sodium hydroxide), soda ash (sodium carbonate), and sodium bicarbonate. Additionally, magnesium hydroxide (Mg(OH)₂) can worsen struvite issues by adding more magnesium to the process. The City's WQCF has noted struvite issues in the past and therefore, Mg(OH)₂ was also eliminated from further consideration. Therefore, the only alternative that could potentially be used for this application is lime (calcium oxide). Hydrated lime is preferred over slaked lime because the hydrating process to convert slaked lime to hydrated lime so that it can be dosed into the process is labor intensive and the dry lime can be unreliable to feed into the process. This can lead to inconsistent treatment and therefore, hydrated lime is recommended for providing additional alkalinity.

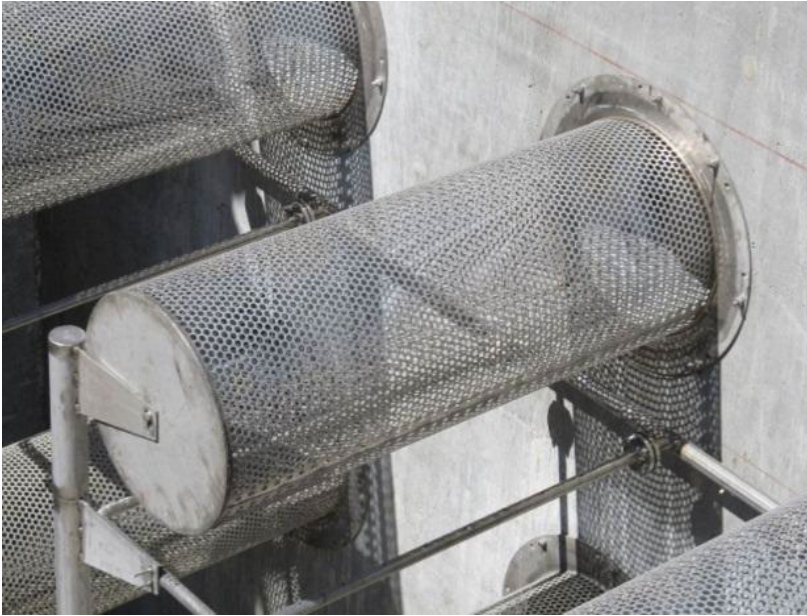
The estimated facility size for hydrated lime was developed. A chemical storage tank and feed system will be required to feed alkalinity to the sidestream treatment process. Chemical bulk storage facility sizing is based on approximate storage of 15 to 20 days. This will require chemical deliveries twice per month. A 5,000-gallon storage tank is recommended for either of the technologies. Additional components will include a mixer and a feed pump.

2.4.5 Process Equipment

2.4.5.1 ANITA™ MOX

The ANITA™ Mox process consists of four major in-basin mechanical components:

- Stainless Steel Screens – The stainless-steel screen assemblies are used to retain the media within the reactor.



- Aeration Grid – The aeration system is medium/coarse bubble system.



- Media/Media Carriers – Anammox bacteria grow as a fixed biofilm on high-density polyethylene media carriers. The media provides a large surface area for biofilm growth. Since the biofilm is attached to the media, there is low risk of washout.



- Mixer – A mixer is provided in the system to keep the media in suspension when aeration is off.



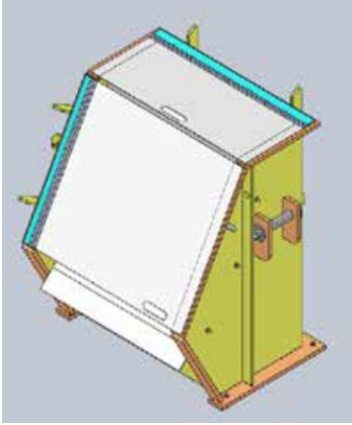
- Instrumentation and Controls – The ANITA™ Mox system will include a PLC control panel, high level float switch, submersible level probe, DO probe, pH meter, thermal mass airflow meter, and a magnetic flow meter. The included instruments and control system will help control the overall operation of the process.

2.4.5.2 DEMON®

DEMON® 2.0 was considered for this evaluation which replaced the hydrocyclones in DEMON® 1.0 with microscreens. Based on the operational data from the Strass Wastewater Treatment Plant, Austria, with the addition of the microscreen, the process has been able to treat higher NH_3 loads while maintaining the same percent removals.

The major components of the process are described as follows:

- Microscreen – The microscreen is the newest addition to the DEMON® process which helps with biomass separation and wasting. DEMON® is a suspended phase process and therefore requires wasting sludge from the system. Since the anammox bacteria have slower growth rates compared to AOBs and NOBs, it is essential to retain the anammox bacteria in the process. The amount of solids that need to be wasted are pumped to the microscreen. The anammox bacteria are retained on the microscreen since they are larger in size compared to the AOBs and NOBs and are further returned to the sidestream reactor. The remaining AOBs and NOBs are used for wasting.



- Internal Settling Zone – An internal settling zone is provided to allow for a continues operation of the DEMON® process. The internal settling zone allows for settling of anammox bacteria which are returned to reactor while the clarified effluent continuously removed from the top of the reactor.



- **Aeration Panels** – The process uses Messner aeration panels that are known to provide high oxygen transfer rate and efficiency. The main benefit of using the aeration panels is lower energy costs due to higher efficiency of the system. Additionally, the process utilizes a pH control strategy for aeration which includes a two-phase cycle. The first phase of the cycle is an anoxic/mixing phase while the second phase is the aerobic phase. Maximum and minimum pH set points are designated for both the phase. As the pH increases and reaches the maximum setpoint in the first phase, the blowers turn on and air is supplied. Once the pH reaches the minimum setpoint in the second phase, the blowers turn off and the cycle switches to the first phase again.



- **Mixer** – A side mounted mixer is included in the system to keep the biomass in suspension during the anoxic phase of the treatment cycle.



- **Instrument Float** – The system will include instruments for control of the process that will be installed on a float system. A pH and DO probe will be provided for control of the overall operation of the process. A dedicated controller for the DO and pH is recommended. A conductivity probe is also included in the system with its own controller.

2.4.6 Process Comparison

As seen in the previous sections, in terms of process improvements, sizing, and costs, both the technologies are very similar. To differentiate between the two technologies, an overall process comparison is drawn in Table 6 and is discussed as follows:

- Aeration – The aeration strategy and system used between the two technologies are different. ANITA™ Mox uses a coarse bubble system with continuous airflow while DEMON® uses Messner panels with intermittent airflow. Messner panels are known to be more efficient than coarse bubble system, however, they require more frequent maintenance.
- Controls – The DEMON® process has a few more control parameters than the ANITA™ Mox process. More control parameters provide the ability to better optimize the process, however, it can require more labor/operational input.
- Biomass Management – ANITA™ Mox has a benefit of fixed film growth that does not require any additional sludge pumping and wasting and there is less risk of washout, while the DEMON® process requires sludge management through microscreens and internal settling zone and there may be a higher risk of washout since it is a suspended growth process.
- Performance – DEMON® process has the ability to provide additional 5 percent NH₃ removal compared to ANITA™ Mox, however, the additional 5 percent removal requires more alkalinity and therefore, increases the O&M costs.

Table 6 Overall Process Comparison

Element	ANITA™ Mox	DEMON®
Aeration	▪ Continuous aeration ▪ Medium bubble diffusers	▪ Intermittent aeration ▪ Messner panel (fine bubble) diffusers
Controls	▪ Feed flow rate ▪ Air flow rate (typically based on DO)	▪ Feed flow rate ▪ Air flow rate and cycle times (typically based on pH) ▪ Recirculation flow rate (typically based on granular size and nitrogen concentrations)
Biomass Management	▪ Fixed film growth on plastic media carriers ▪ Media retention screens	▪ Internal recirculation pump through microscreen ▪ Effluent settling zone
Target Performance	▪ 85% NH₃ removal ▪ 75% TIN removal	▪ 90% NH₃ removal ▪ 80% TIN removal

2.4.7 Economic Evaluation

2.4.7.1 Capital Costs

Capital costs represent the total expenses to complete a new project, including design, bidding, and construction. Capital costs were developed in accordance with the standards of the Association for the Advancement of Cost Engineering (AACE) International. AACE International defines five different classes of cost estimates, Class 1 to 5. The level of accuracy of the cost estimates decreases from Class 1 to 5. Class 5 estimates are typically used for planning level and concept screening purposes and have an accuracy range between -50 to +100 percent. Capital cost estimates include an escalation to the mid-point of construction, assumed to be September 2026.

Capital cost estimates were developed utilizing the budgetary quotes from sidestream technology manufacturers. The budgetary quotes typically include equipment and material costs. Depending on the scope of the budgetary quotes, percent allowances for work such as equipment installation; electrical, instrumentation, and control (EI&C); process piping etc., are added as shown in Table 7. Additional infrastructure and equipment beyond the manufacturer's scope of work, such as concrete tanks and buildings for new equipment, are estimated using unit cost curves and Carollo's cost estimating database tool. The manufacturer's quotes, percent allowance, and additional infrastructure are summed up to obtain the total direct cost (TDC). The estimated construction cost is a sum of direct and indirect costs. Indirect costs include estimating contingency, contractor overhead and profit, sales tax, etc.

Table 7 Basis of Capital Cost Estimates

Item	Unit	Value
Equipment Installation	Equipment Cost	30%
Metals	New Structures and Equipment	5%
EI&C	TDC	20%
Miscellaneous Process Piping	TDC	15%
TDC		
Contingency	TDC	30%
General Conditions (Mobilization, Permits, Bonds/Insurance)	TDC + Contingency	15%
Sales Tax	50% of TDC	8.25%
General Contractor Overhead and Profit	TDC + Contingency + Sales Tax + General Conditions	18%
Escalation to Midpoint of Construction	TDC + Contingency + Sales Tax + General Conditions + General Contractor	5%
Construction Cost		

Figure 13 presents the capital cost of the sidestream alternatives. As seen in the figure, the project capital costs are very similar and within 1 percent of each other because of the similarities in the process and infrastructure required.



Figure 13 Capital Cost Comparison

2.4.7.2 O&M Costs

The O&M costs include estimated annual costs for electrical power, maintenance, labor, and chemical usage. Table 8 summarizes the unit costs and assumptions made for calculating the O&M cost estimates.

Table 8 O&M Unit Costs

O&M	Unit Cost
Electricity	\$0.25/kWh
Lime Slurry	\$0.25/lb
Maintenance	4-5% of equipment cost per year
Burdened Labor	\$60/hour

Notes:

kWh – kilowatt-hour.

The O&M costs are estimated as relative comparisons of the alternatives and may not be an absolute reflection of the overall cost to operate because it does not account for things such as potential cost savings for lower aeration demands in the mainstream. Costs that are common to all alternatives were not included.

Figure 14 presents the O&M costs of the sidestream alternatives. As seen in the figure, the power costs for ANITA™ Mox are higher than DEMON® due to higher airflow demand. However, DEMON® has more equipment and additional process control, which increases the estimated labor and maintenance costs. Additionally, DEMON® has higher alkalinity costs to achieve higher removal rates. Overall, the DEMON® O&M costs are predicted to be slightly higher than the ANITA™ Mox costs.

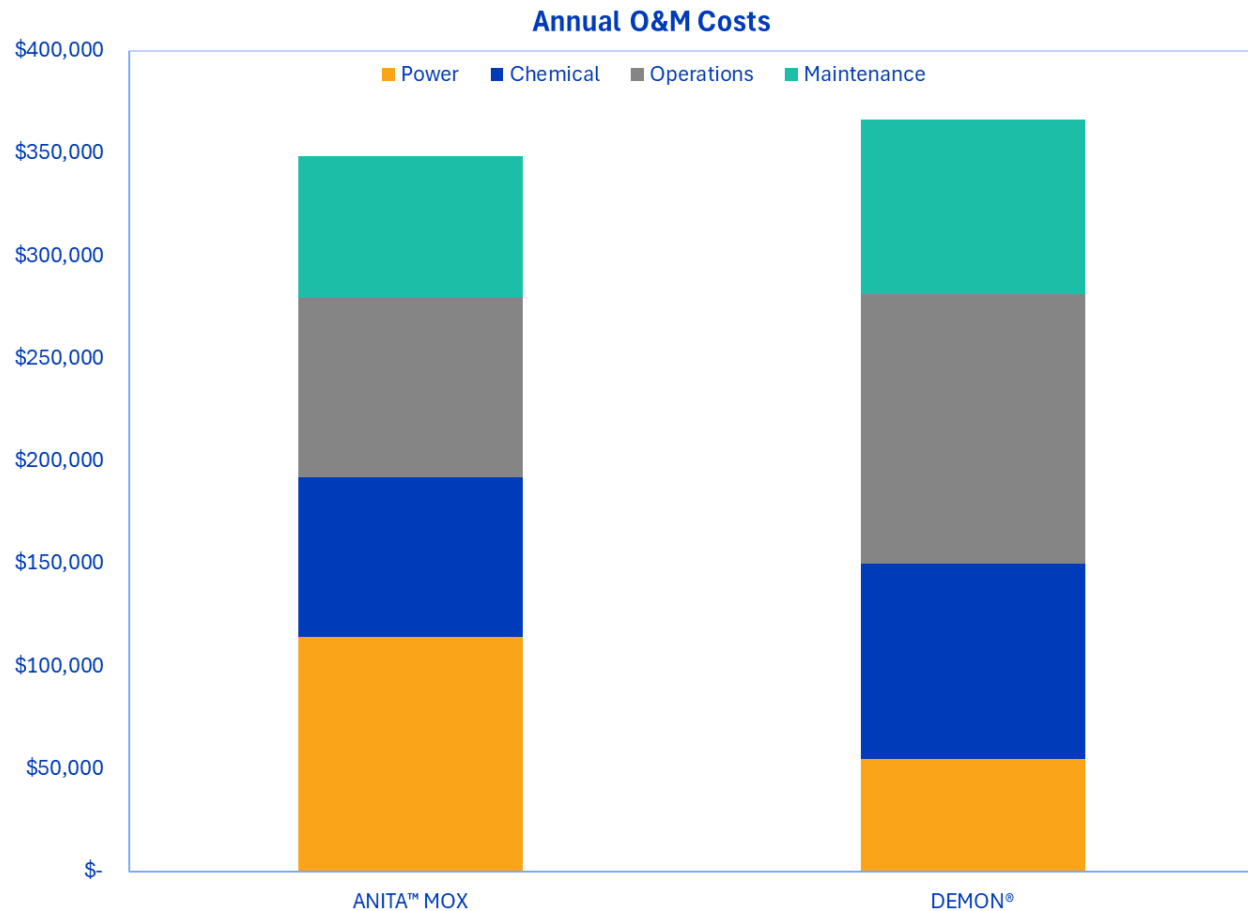


Figure 14 Annual O&M Cost Comparison

2.4.7.3 Life Cycle Costs

The life cycle costs represent the value of the total cash flow occurring over the 20-year lifetime of the project in current dollars, including both capital and O&M Costs. An O&M inflation rate of 5 percent was used for estimating 20-year O&M costs and a discount rate of 3 percent was used to calculate the net present value (NPV).

Table 9 and Figure 15 present the life cycle costs, which include the capital cost and the NPV of the 20-year O&M costs. Since the capital and O&M costs were very similar for both the technologies, the life cycle costs resulted in being similar as well.

Table 9 Life Cycle Costs

Technology	Capital Cost, \$	Annual O&M, \$	20-year O&M, \$	Life Cycle, \$
ANITA™ Mox	12,570,000	349,000	8,784,000	21,354,000
DEMON®	12,550,000	367,000	9,237,000	21,787,000

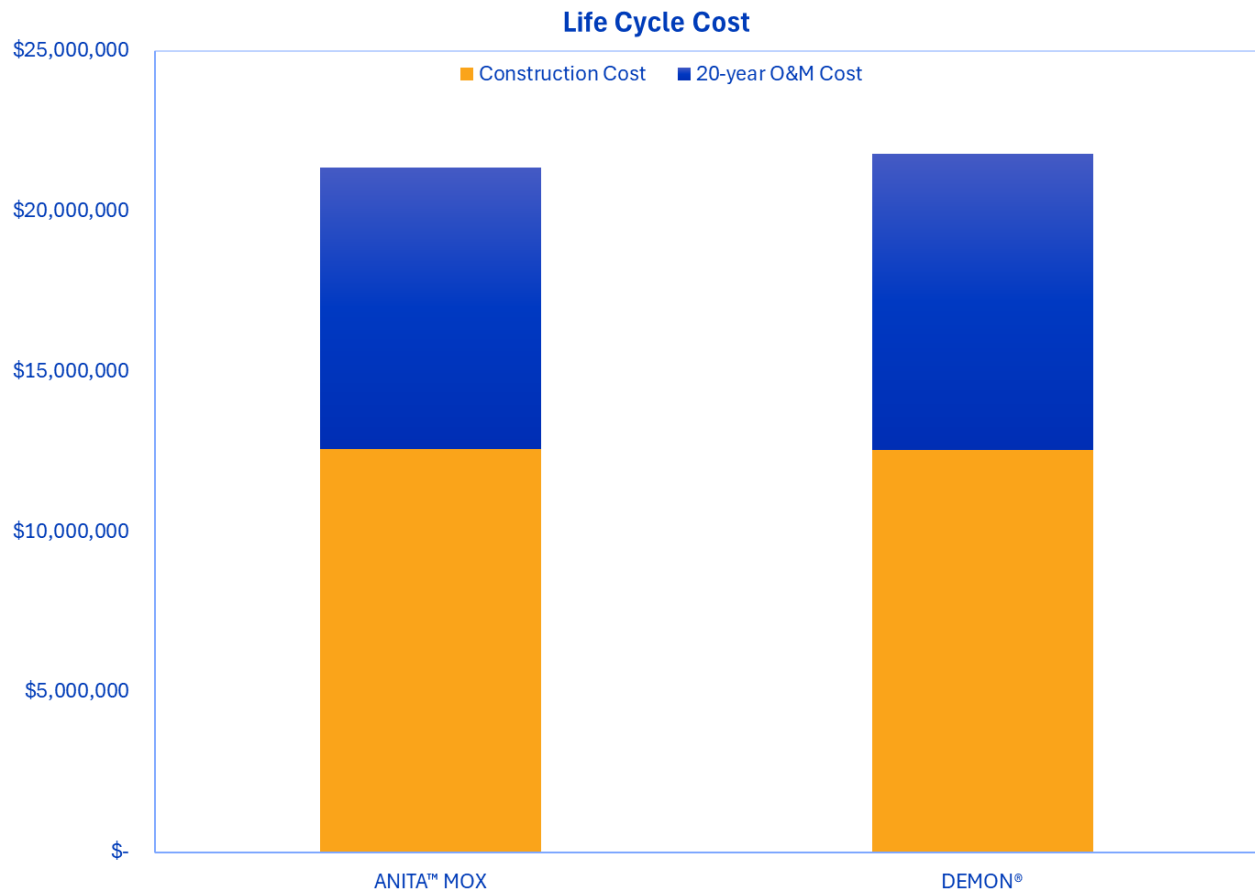


Figure 15 Life Cycle Cost Comparison

2.5 Site Visit Summary

The City requested to visit reference facilities with operating installations to help make a decision between technologies, especially for sidestream treatment, where the alternatives have very similar performance, life cycle costs, and design requirements. In December 2024 members of the project team traveled with plant staff to several operating sidestream treatment facilities to see process equipment and speak with plant staff to understand O&M requirements and gain better insight into the complexity and performance differences between the two alternatives. Facilities visited are summarized in Table 18. Notes from the site visits are included in Appendix E.

Table 10 Sidestream Site Visit Summary

Agency	Facility	Sidestream Treatment Process
DC Water	Blue Plains AWWTP	DEMON 1.0 and 2.0
Howard County, MD	Little Patuxent WRP	ANITA™ Mox
Pierce County, WA	Chambers Creek WWTP	DEMON 1.0
Central Valley WRF (Salt Lake City, UT)	Central Valley WRF	ANITA™ Mox

2.6 Recommended Alternative and Implementation

Based on site visits to operating facilities, it is recommended to implement an ANITA™ Mox sidestream treatment facility. ANITA™ Mox has less process equipment, simpler controls, and is less susceptible to losing biomass through washout events. Based on discussions with plant staff at reference facilities, two parallel sidestream treatment reactors and EQ basins would provide additional flexibility for operations and equipment maintenance. The approach to have two trains will need to be confirmed with the manufacturer to confirm that the reduction in individual reactor size will not affect treatment performance. Basin and equipment sizing will be determined during preliminary design. Nearly all of the operating DEMON® facilities in the US operate in SBR mode, which requires more oversight and additional process complexity. DEMON® 2.0 has made process improvements by operating in continuous feed instead of SBR, but the granules are still susceptible to washout if they aren't maintained appropriately. Excess polymer dosing can stick to the granules and cause settleability issues. Also, the suspended growth biomass is negatively affected by high influent TSS, more so than fixed film biomass.

DEMON® is capable of achieving slightly higher removal rates (typically 85-90 percent NH3 removal) compared to ANITA™ Mox (typically 75-85 percent NH3 removal) because suspended growth has a higher biomass surface area than fixed film. However, the increased process oversight and optimization required does not seem to be worth the marginal improvement achieved, particularly if the improved performance comes at the risk of more frequent process upsets. DC Water has PhDs and PEs that are consistently investigating process improvements to their DEMON® process. Pierce County said their DEMON® process requires more operational oversight than any other process at their plant. Compared to Howard County ANITA™ Mox facility where they have no complaints and provide minimal operational intervention.

SECTION 3 UV TREATMENT ALTERNATIVES EVALUATION AND PRELIMINARY DESIGN

3.1 Existing UV Facilities

The existing UV facility consists of an inlet basin, two UV channels, and a wet well with an effluent pump station. Electrical room containers rest over enclosed spaces on each side of the channels, powering each channel independently. The system cables are fed through the enclosed space to the UV channels via cable trays and conduits. The master control panel is located in the southern electrical container. The

facility is electrically fed from the adjacent effluent MCC/generator building. A bridge crane spans the entire structure, allowing removal of UV banks/modules and pumps.

3.1.1 Current Performance

The existing UV disinfection system was installed in 2007 and is approaching the end of its useful life. Operations staff have noted differences in performance between the two channels with no logical explanation. The UV manufacturer, Wedeco (a Xylem brand), has assisted the City in investigating the differences, but has not been able to determine a reason for the varied performance. The existing south channel has had more coliform hits necessitating increasing the UV dose setpoint to over 200 millijoules per square centimeter (mJ/cm^2), using significantly more energy than called for in the design to achieve the permitted disinfection levels. City staff have indicated that they lack confidence in the reliability of this channel and use the north channel as the duty channel.

3.2 Design Criteria

This section discusses the critical parameters used to size a replacement UV disinfection system, including flow, ultraviolet transmittance (UVT), UV dose, UV equipment design factors (quartz sleeve fouling and end of lamp life), and redundancy.

Each parameter is discussed in the following sections and the design criteria are summarized in Section 3.2.6.

3.2.1 Design Flows and Redundancy

The peak design flow for the replacement UV system is 31.08 mgd, based on the 2024 *Master Plan*. The Master Plan assumed 11.54 mgd from the existing plant plus 19.54 mgd anticipated from a new membrane bioreactor system planned to accommodate future growth. There is currently a 42-inch flow meter located upstream of the UV facility that records flow to the UV facility.

The permitted AA design flow is 9.87 mgd. Historical data (January 2016 to February 2021) shows an AAF of 7.13 mgd.

The National Water Research Institute's *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (Third Edition, August 2012) (2012 NWRI *UV Guidelines*) require a standby bank per channel or a standby channel. For this project, a standby bank in each channel will be provided to provide the required redundancy. All channels are required to be operational at the design peak flow.

3.2.2 UVT

UVT is an essential indicator of water quality and is a critical factor in UV system design and performance. It is a measure of the percentage of UV light at a wavelength of 254 nanometers that passes through 1 centimeter of effluent sample. The UVT is dependent on both dissolved and suspended matter present in the water which lowers UVT by scattering and absorbing the UV light. To illustrate the extent to which UVT can impact system design, just a 5 percent increase in UVT can equate to approximately 20 percent reduction in the total lamp count.

Historical UVT data was analyzed from June 2020 through June 2024. Plant staff noted the originally installed UVT analyzer would often drift and required frequent recalibration. The analyzer was replaced during the summer of 2024. Based on this data, the average UVT is 65.6 percent and the lower 10th percentile UVT is 60.4 percent. A design UVT level of 60 percent was selected for this replacement evaluation as a conservative value.

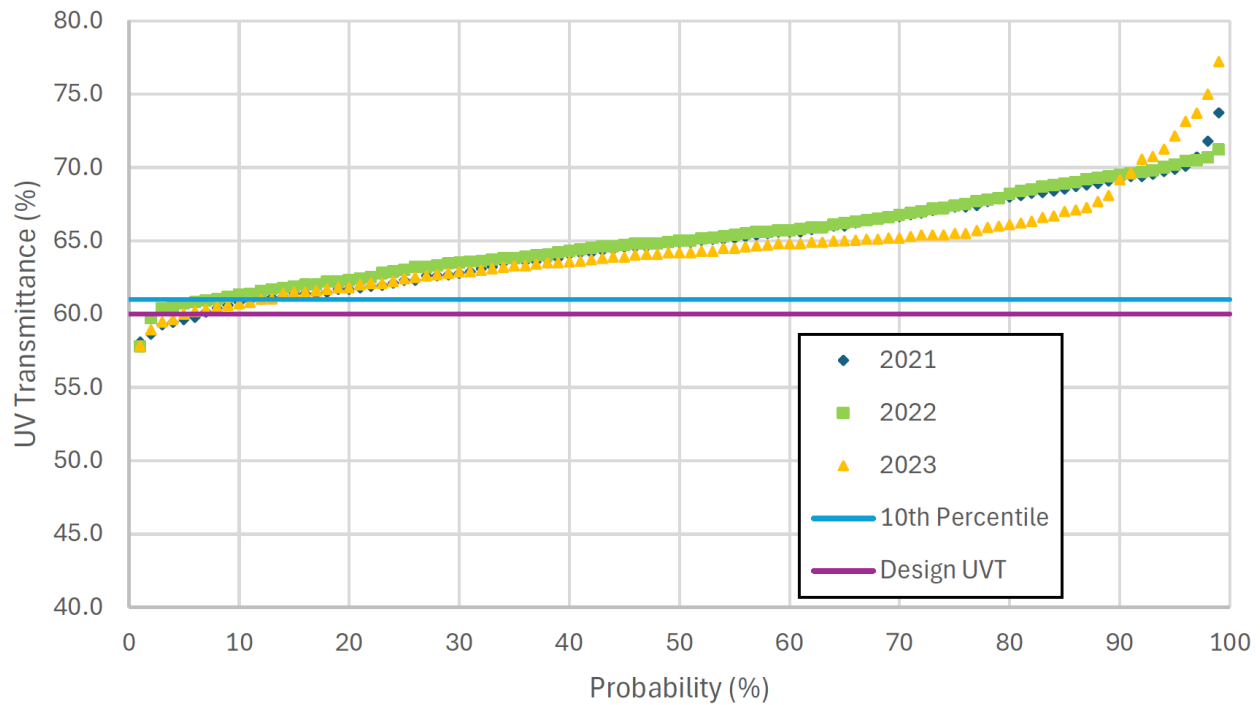


Figure 16 UVT Probability

3.2.3 UV Dose

3.2.3.1 UV Dose for Reuse

The WQCF is currently regulated by an NPDES permit that specify limits for total coliform:

- 2.2 most probable number per 100 milliliters (MPN/100 mL), as a 7-day median.
- 23 MPN/100 mL, more than once in any 30-day period.
- 240 MPN/100 mL, at any time.

The design dose for reuse is prescribed by the 2012 NWRI *UV Guidelines*. The minimum bacteriophage MS2 (MS2) reduction equivalent dose (RED) shall be at least 100 mJ/cm² under maximum day conditions based on a media filtered effluent to provide virus inactivation equivalent to Title 22 Disinfected Tertiary Recycled Water. Due to the inherent variability of UV systems and their installations, Carollo recommends a design dose of 102 mJ/cm² to ensure the minimum dose prescribed in the 2012 NWRI *UV Guidelines* is met under all operating conditions.

3.2.4 Quartz Sleeve Fouling Factor

Sleeve fouling occurs as dissolved and/or suspended materials deposit from the water onto the surfaces of the quartz sleeves. Over time, this can reduce sleeve transmittance, reducing the delivered UV dose. Fouling can be mitigated through cleaning practices. Chemical/mechanical systems are typically effective at maintaining sleeve transmittance close to that of new sleeves as long as an appropriate cleaning interval is established and as long as the chemical is checked and replenished periodically. Mechanical wiper systems are also effective, assuming an appropriate cleaning interval is determined, but some degradation in sleeve transmittance over time is inevitable. All UV systems should have a provision for intermittent acid washing or manual cleaning of the lamp banks regardless of the type of cleaning system employed.

Sleeve fouling can vary significantly from site to site, so it is important to understand the fouling characteristics of the water and the effectiveness of the cleaning systems. The UV manufacturers being considered for this project utilize the quartz sleeve fouling factors presented in Table 11.

Table 11 Quartz Sleeve Fouling Factor

UV Manufacturer	Design Factor
Trojan UVSigna 2-Row	0.94
Wedeco Duron	0.90
Veolia Aquaray HiCAP	0.84

3.2.5 End of Lamp Life Factor

The output from UV lamps degrades over time resulting in a decrease in disinfection efficiency that must be taken into account in the design process. Similar to sleeve fouling, lamp aging also may vary between UV manufacturers. All of the UV equipment manufacturers being considered for this project have evaluated the degradation in UV lamp output over time in general accordance with the 2012 NWRI *UV Guidelines* and are presented in Table 12.

Table 12 End of Lamp Life Factor

UV Manufacturer	Design Factor
Trojan UVSigna 2-Row	0.86
Wedeco Duron	0.85
Veolia Aquaray HiCAP	0.86

3.2.6 Design Criteria Summary

All of the UV systems being considered for this project have gone through third party validation testing and all are capable of complying with the design criteria for this project. Table 13 provides a summary of the UV design criteria: flow rates, UVT, TSS, MS2 RED, redundancy, and permit limits. The configuration/footprint design criteria reflect the desired number of channels and the existing UV channel dimensions.

Table 13 UV System Design Criteria

Description	Design Criteria
Design Parameter	
Peak Design Flow Rate (mgd)	31.08
Average Day Flow Rate (mgd)	9.87
Design UVT (percent)	60
Average UVT (percent)	65
TSS (mg/L)	< 5
Minimum MS2 RED (mJ/cm ²) ⁽¹⁾	102.0
Redundancy	N+1 Banks per Channel at Peak Flow
Hydraulics	
Maximum Allowable Headloss across UV System ⁽²⁾ (inches)	8.0
Level Control Device	Finger Weirs
Permit Limit	
Total Coliform, 7-day median	2.2 MPN/100 mL
Total Coliform, more than once in any 30-day period	23 MPN/100 mL
Total Coliform, at any time	240 MPN/100 mL

Notes:

(1) The RED is based on the 2012 NWRI *UV Guidelines* for media filtration.

(2) The allowable headloss is the total available head from the UV inlet basin to the downstream side of the effluent weir (Based on maximum water level in the effluent pump station clear well per the 2011 Record Set). This provides the limiting headloss factor for UV bank and appurtenances at peak flow.

3.3 Alternatives Evaluation

3.3.1 Evaluation Approach

For each of the selected alternatives, the evaluation included the development of the following components:

- Conceptual layouts.
- Non-financial comparison including reliability, O&M ease, and risk.
- Capital, O&M, and life cycle costs.

3.3.2 Manufacturers Evaluated

Three UV manufacturers (Trojan UVSigna (2-Row); Wedeco, a Xylem brand, Duron; and Veolia Aquaray HiCAP) (suppliers) were evaluated in this study. The Suppliers were contacted and requested to submit preliminary equipment and cost proposals. All manufacturers utilize low-pressure, high-output UV lamps and have system validations that are in compliance with the 2012 NWRI *UV Guidelines*.

While all Suppliers' products operate on the same principles, they have different configurations, maintenance, and replacement needs. The features of the three products offered for this project are detailed and compared in this section.

3.3.2.1 Trojan UVSigna 2-Row

Trojan introduced the UVSigna (4-Row) system in 2010. In 2015, Trojan improved the four-row system and introduced a 2-row system (Figure 17). Trojan completed the validation report for this system in January 2017. Currently there are over 150 full scale installations of the Trojan UVSigna 2-Row system in operation or ordered, the oldest is in Paragould, Arkansas (6 mgd) that has been in operation since June 2016. Carollo recently completed a 157.5 mgd UV project for JEA, Florida, with the Trojan UVSigna 2-Row.



Figure 17 Trojan UVSigna 2-Row System (JEA, Florida)

The Trojan UVSigna system uses a 1,000-watt (W) TrojanUV Solo Lamp™. These lamps are staggered at a 45-degree inclination that makes lamp replacement relatively easy while the UV system remains in operation. The Solo Lamp Driver enables lamp dimming from 100 to 30 percent power and can be located up to 80 feet away from the power distribution centers (PDC). The Trojan UVSigna system can be operated based on actual UV output measured by the UV intensity sensors, offering cost savings from an O&M perspective.

The system is equipped with Trojan's patented automated chemical/mechanical cleaning system where a non-toxic cleaning chemical is injected into the wiper system and is contained between two seals. The cleaning system is hydraulically actuated and reduces the need for manual cleaning.

3.3.2.2 Wedeco Duron

Wedeco, a Xylem brand, introduced the Duron system (Figure 18) in 2012. It is designed to fit into existing UV system structures. Wedeco completed validation testing of its Duron system in May 2013 with the final validation report issued in April 2014. Currently there are more than 120 Duron systems operational or on order in North America.



Figure 18 [Wedeco Duron System \(Valparaiso, Indiana\)](#)

The Wedeco Duron system uses 600W lamps. These lamps are staggered and are at a 45-degree inclination that makes lamp replacement relatively easy while the UV system remains in operation. The lamp ballast enables the lamp to dim from 100 to 50 percent and can be located up to 80 feet away from the UV modules. Similar to Trojan, the Wedeco Duron system can be operated based on actual UV output measured by the UV intensity sensor, offering cost savings from an O&M perspective.

The mechanical wiping system used to prevent quartz sleeve fouling is driven by an electric motor, one per UV module. As with all mechanical cleaning systems, acid cleaning in a separate cleaning tank or manual hand wiping would be required for periodic cleaning.

Wedeco, a Xylem brand, introduced the Duron 8 system in 2021. It is designed to fit into most existing UV system structures. Wedeco completed validation testing of its Duron 8 system in April 2023. Currently there are no Duron 8 systems operational in California for reuse, and therefore this option was eliminated from contention.

3.3.2.3 Veolia

Veolia introduced the Aquaray HiCAP in 2013 at WEFTEC (Figure 19). Aquaray HiCAP has been designed for high-capacity municipal wastewater and reuse applications. Veolia completed validation testing of its system in March 2016. Currently, there are two installations in operation or ordered in the US, the oldest is in Auburn, New York, (25.4 mgd) that has been in operation since March 2020. There are a few large UV systems that are installed and operational internationally.



Figure 19 Veolia Aquaray HiCAP (Auburn, New York)

Veolia Aquaray HiCAP system uses 1,000W lamps. These lamps are placed in a staggered array oriented vertically to the flow in a channel. Vertical lamp system allows above channel access to UV lamps and quartz sleeve as well as maintenance work to be performed without removing the UV module from the channel. Variable-output electronic ballasts allow dimming from 100 to 40 percent. The Veolia Aquaray HiCAP system utilizes its flow pacing technology and 360-degree UV intensity sensor to dim and reduce the total number of lamps in operation to match flow conditions, offering cost savings from an O&M perspective.

The mechanical wiping system used to prevent quartz sleeve fouling is driven by an electric motor, one per UV module. Similar to the other mechanical cleaning systems, acid cleaning in a separate cleaning tank or manual hand wiping would be required for periodic cleaning.

3.3.2.4 System Comparison

The system configurations along with the total lamp counts and power consumption are compared in Table 14. Suppliers' proposals are included in Appendix B.

Note that although the suppliers were given a design MS2 dose of 102 mJ/cm², the dose of each system varies based on the need to meet other requirements such as head loss constraints.

Table 14 Replacement UV Disinfection Suppliers Summary

Description	Trojan UVSigna 2-Row	Wedeco Duron	Veolia Aquaray HiCAP
Design Parameter			
Quartz Sleeve Fouling Factor	0.94	0.90	0.84
End of Lamp Life Factor	0.86	0.85	0.86
MS2 RED (mJ/cm ²), per 2012 NWRI <i>UV Guidelines</i>	102.1	104.6	106.0
Configuration			
Number of Channels	3	3	3
Number of Duty Banks/Channel	6	10	6
Number of Standby Banks/Channel	1	1	1
Total Number of Banks/Channel	7	11	7
Number of Modules/Bank	1	2	1
Number of Lamps/Module	22	16	36
Total Number of Lamps	462	1056	756
Number of UV Sensors	21	33	21
Number of PDCs	9	33	6
Number of Master Control Panels	1	1	1
Number of Remote Local Operator Interface Panels	1	1	1
Total Power Consumption (kW)	501.8	687.4	819.7
Number of Lamps Operating at Average Conditions ⁽¹⁾	110	256	198
Power Consumption at Average Conditions(kW) ⁽¹⁾	119.6	168.9	214.9
Headloss per Channel at Design Flow (inches)	2.2	2.7	1.9
Headloss per Channel at Design Flow x 1.20 (inches)	2.9	3.3	2.3

Notes:

kW – kilowatts.

(1) Average Conditions are defined as a flow rate of 9.87 mgd and a UV transmittance of 65 percent.

3.3.3 Layout Alternatives

Two preliminary layouts were prepared to guide the conceptual basis of design of the new UV system based on hydraulic, process, and spatial constraints. The thickening and dewatering project noted liquefaction is a concern for the nearby site. Piles will likely be required for all new heavy structures.

3.3.3.1 Option A: Retrofit Existing Structure to Accommodate Three Channels

Option A involves retrofit of the existing structure, and the construction of a new electrical building. Retrofit of the existing structure involves converting existing channel 2 and the adjacent electrical space into three channels. To accomplish this, the structure requires significant structural modifications, including:

- Deepen channel 2 by about 2 feet and thicken walls to facilitate the new UV banks.
- Demo the northern electrical area elevated slab and raise the floor.
- Extend the inlet basin to the additional channels and build an outlet channel to convey UV effluent back to the wet well.
- Remove the bridge crane and its support column in conflict with the channel layout.
- Extended all walls upstream of the new finger weirs 6 inches to match Trojan operating water level.

The new PDCs and required cable trenches would be installed in a new electrical building just to the north of the existing facility. The existing north stairs would be demolished, and new stairs installed on the north side to make room for the extended inlet basin. The existing channel 2 inlet gate would be demolished and new inlet gates and finger weirs would be installed. The channel 2 weir gate may be able to remain to facilitate construction. A conceptual layout of this option is shown in Figure 20.

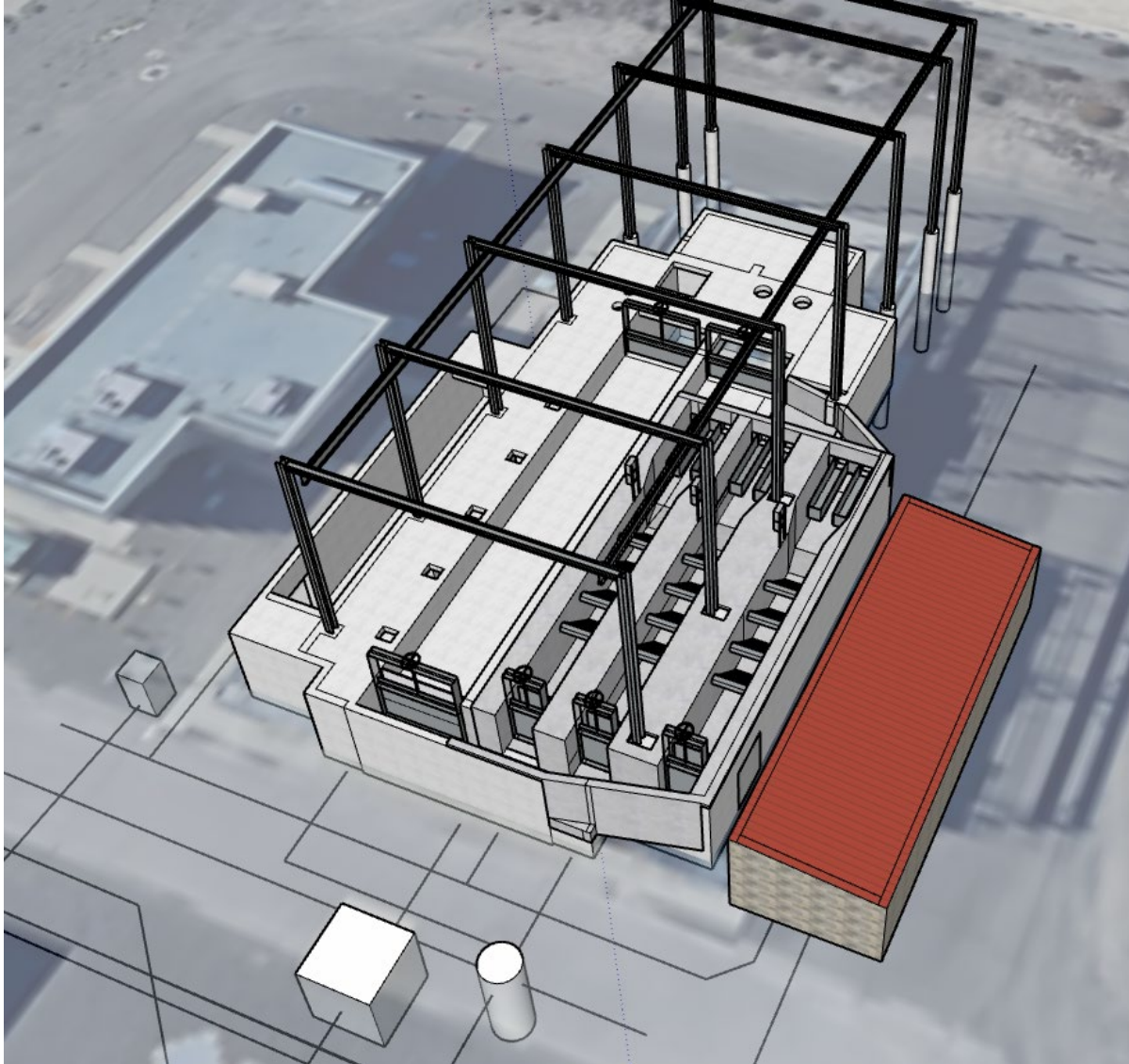


Figure 20 UV Retrofit Alternative (Option A)

Overall, the advantage of Option A is that it utilizes as much existing infrastructure as possible. There are multiple disadvantages to this option. The structure is not well suited for the new modules, requiring significant structural modification. Construction of any of the new channels would require demolition of the north UV channel and electrical room, limiting plant operation to a single channel. Channel 1 would need to operate perfectly during the construction, and the facility would not have sufficient capacity during wet weather events. As noted in Section 3.1.1, channel 1 has had operational issues in the past. Only the Trojan UVSigna 2-Row will fit within the existing channel, eliminating the other suppliers.

3.3.3.2 Option B: Construct New UV Facility

Option B involves the construction of a new UV facility and either separate or connected electrical building. The new facility would be located just north of the existing UV facility, where the UV expansion was planned to be constructed. The area is ideal, with almost no utilities located within. Construction of a new UV facility includes building three UV channels, an inlet and outlet basin, and connecting to the 42-inch filtered effluent downstream of the flow meter, and to the effluent pump station wet well. Each UV channel would include a motorized inlet gate, baffle plate, and effluent finger weirs. PDCs and cable trenches would be installed within a connected or adjacent electrical building. A conceptual layout is shown in Figure 21.

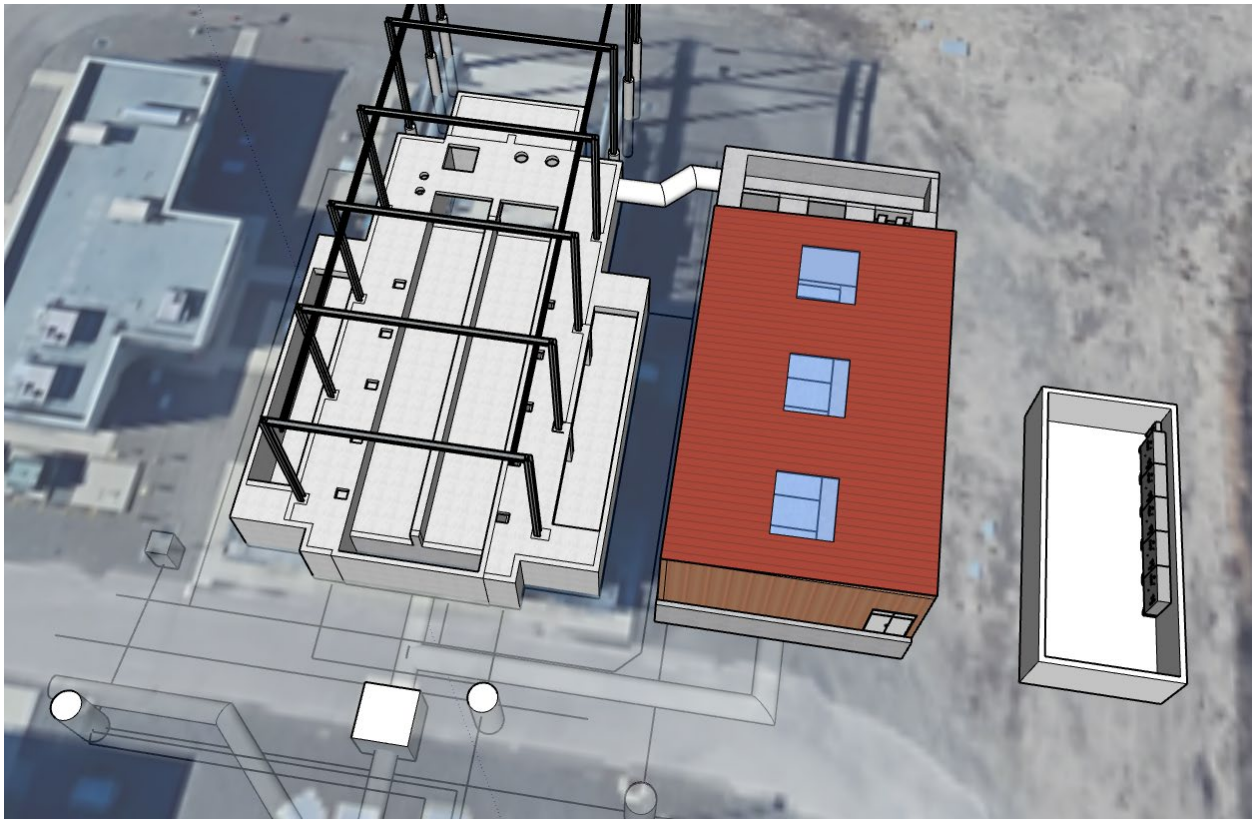


Figure 21 New UV Facility Alternative (Option B)

The advantage of Option B is that the existing UV facility may remain in operation while the new facility is constructed and tested. Aside from tie-ins, there will be little impact on the existing facility during construction. The disadvantage is that the existing UV facility would not be reused.

3.3.4 Design Considerations

Additional design considerations are outlined below for the UV replacement project.

3.3.4.1 Process Flow Diagram

The UV system is currently divided into two channels. Flow from the tertiary filters is conveyed through the 42-inch flow meter and into the UV inlet basin for a split to each channel. Flow through the channels flows over the motorized weir gates and into the effluent pump station, where it can be pumped or gravity flow to the secondary effluent storage pond or the outfall at the river. The proposed design will alter the existing process flow diagram very little, adding an additional channel, and converting the motorized weir gates to effluent finger weirs. The proposed process flow diagram is shown in Figure 22.

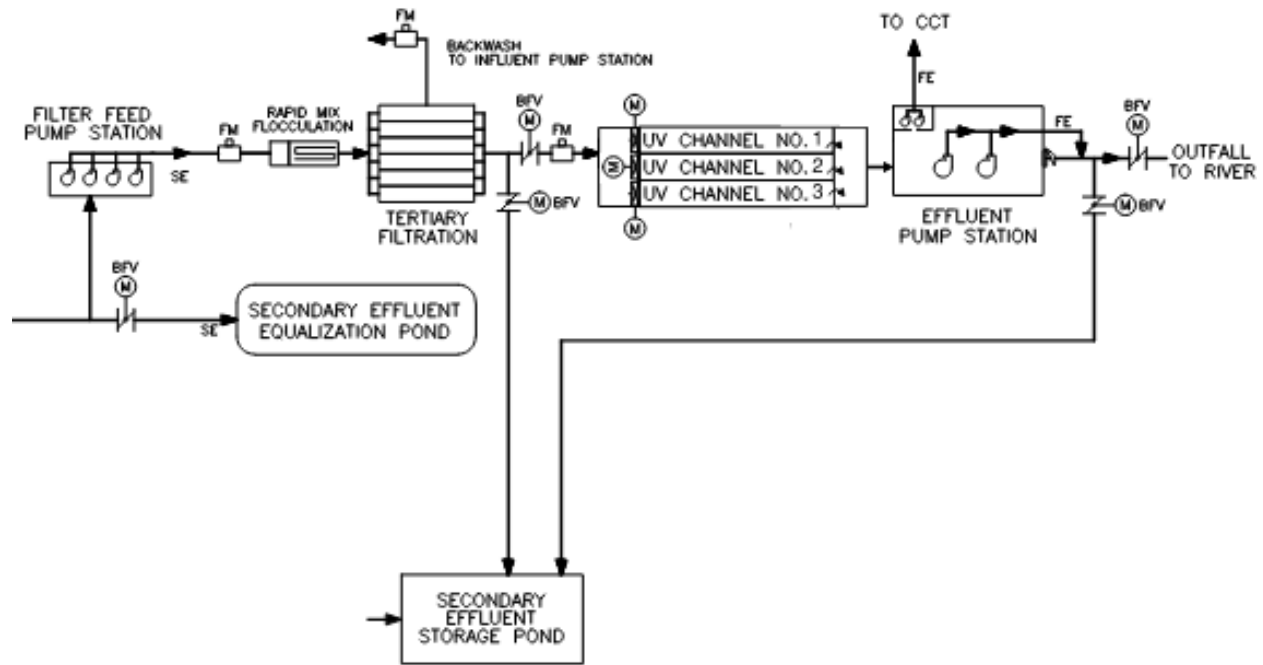


Figure 22 Process Flow Diagram (Partial)

3.3.4.2 Hydraulic Analysis

A new hydraulic model was created for this project using Carollo's Hydraulix® software. The system begins at the tertiary filter effluent and ends at the UV effluent channel. The improvements evaluated for this project will not change water surface elevations upstream of the filter effluent weirs. The preliminary design criteria for the hydraulic model are shown in Table 15.

Table 15 Hydraulic Design Criteria

Criteria	Value	Units
Peak Flow	31.08	mgd
Free-Discharge Over UV Effluent Finger Weirs	5	inches
Head Upstream of UV Effluent Finger Weirs	3	inches
Design Weir Crest Length (Per Channel)	40	feet
Headloss Across UV Banks (Total)	2.2	inches
Headloss from Inlet Baffle Plate	2	inches

New UV effluent finger weirs will be provided to meet the above design criteria and maintain a constant water level and submergence of the UV banks. Preliminary hydraulic calculations result in a minimum weir crest length of 15 feet per channel. The design weir crest length is 42 feet, which provides 3 inches of head on the weir at a flow of 11.5 mgd per UV channel (allows for an additional 11 percent of flow per channel to minimize channel cycling). Refer to Section 3.3.3 for preliminary layout alternatives.

An updated hydraulic profile is shown in Figure 23. The water surface elevation shown in the effluent pump station of 33.20 feet is representative of the hydraulic profile provided in the 2011 Phase III Expansion contract documents. All water surface elevations upstream of the UV effluent channel weir extending to tertiary filter effluent weirs have been calculated by Carollo. Using the elevations on the existing hydraulic profile, the total available head between the tertiary filter weirs and the effluent structure downstream of the effluent weir is 2.62 feet. The effluent pipe from the filters to the UV would need to be upsized to meet the new 31.08 mgd capacity or else the filter weirs will be submerged at peak design flow. There is very little available head between the filters and the effluent pump station max water service elevation, so headloss (mostly minor headloss from fittings) should be reduced where possible.

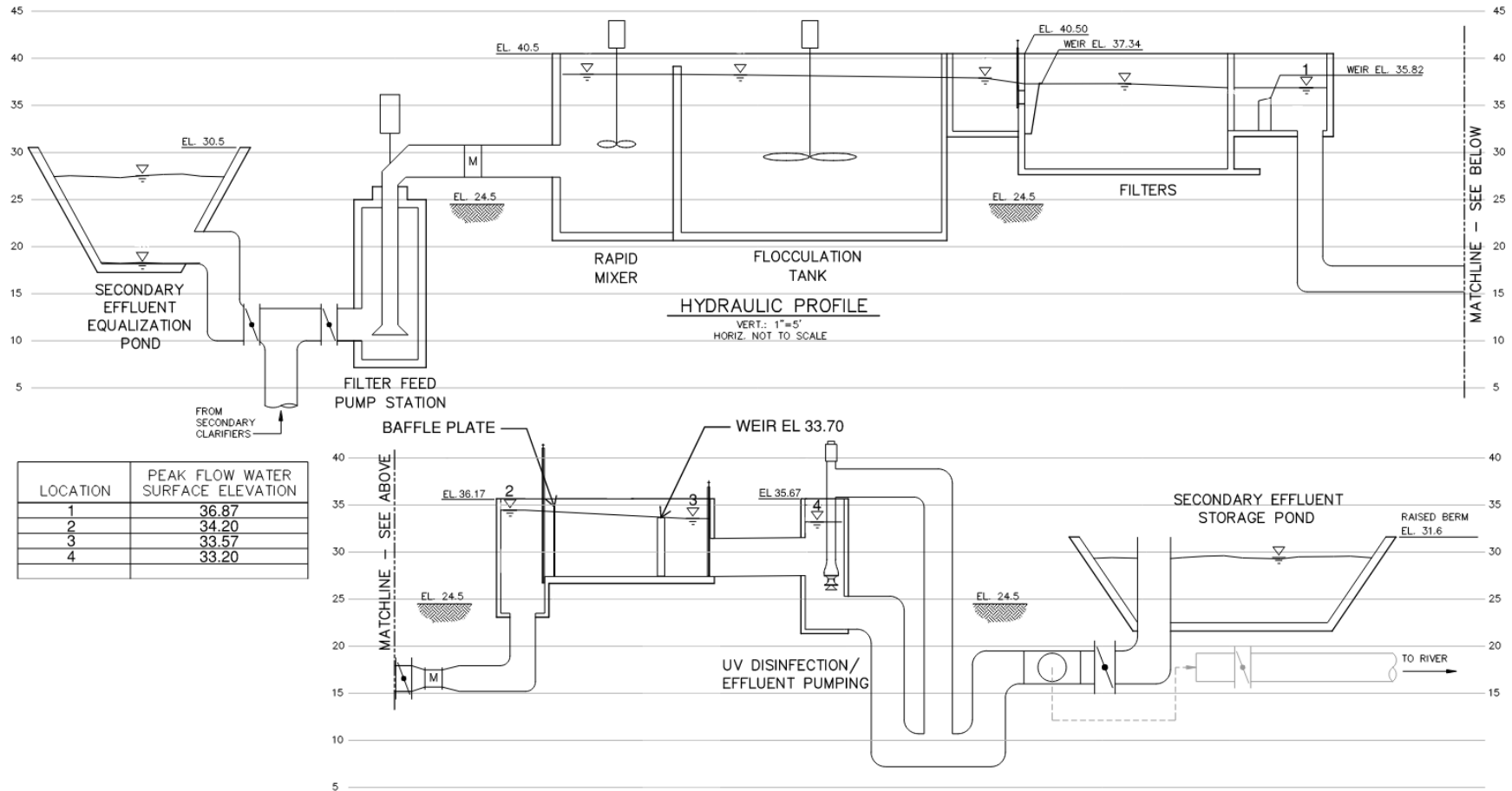


Figure 23 Hydraulic Profile (Showing Weir Submergence at Peak Design Flow)

3.3.4.3 EI&Cs Considerations

The existing UV equipment is a Wedeco TAK55 system comprised of two UV channels, each with a container-style electrical building. Each container is supplied from a dedicated 500 kilovolt-amperes (kVA), 480-400/231V outdoor, dry type transformer. Each transformer is supplied from the existing switchboard DSBE-08-01 (located in the effluent MCC building). Switchboard DSBE-08-01 is rated 277/480V, 3ph, 4W, 2500A. The existing switchboard DSBE-08-01 is connected to a standby generator with a rating of 1875 kVA/1500 kW. While the main switchboard is four-wire, record drawings indicate the standby power switchboard GSBE-08-01 is a three-wire switchboard. There is an automatic transfer switch shown on the Nolte single line diagram (shown in DSBE-08-01) which supplies power to the existing 500 kVA UV transformers when utility power is lost. A field investigation will be required to determine how the system was installed with respect to the neutral when the system is operating on the standby power source. If the neutral becomes disconnected when the system is operating from the standby generator source, then new UV transformers will be supplied with a three-wire, 480V connection to DSBE-08-01.

The existing system has a total connected load of 1,000 kVA (i.e., two 500 kVA transformers). All of the proposed systems have a total load less than the existing system; therefore, the existing upstream power distribution equipment and standby generator equipment do not need to be upgraded. City staff also noted there have not been any power distribution capacity issues for the present overall UV/effluent pumping configuration.

The existing UV/effluent building PLC is Schneider Quantum technology which is now obsolete. The City has indicated they would like to upgrade this PLC panel to a modern Schneider platform (i.e., Modicon M340 or M580 platform).

For each of the new UV systems, we are recommending three separate, dedicated main power supply feeders from the existing switchboard DSBE-08-01 for supply of UV equipment installed within each of the three new UV channels. We also recommend three field-mounted panelboards (one for each new UV channel) which will distribute power to each channel's PDCs.

- For the proposed new Trojan system, the total connected load will be 532.5 kVA. For each of the three dedicated power feeders out to each UV channel panelboard, the demand for each UV channel panelboard will be 177.5 kVA. This translates to a feeder size of 268A. Per the National Electric Code (NEC), this will require one set of 4-300 kilo circular mils (KCMil), 1#4GND XHHW-2 copper conductors in a 4-inch conduit. Note that the upstream switchboard is 3ph, 4W, however the record drawings indicate the upstream generator nameplate is 3 ph, 3W, so there may need to be a transformer between the upstream switchboard and each UV area 480V panelboard when operating on backup power.
- For the proposed new Wedeco system, the total connected load will be 718.4 kVA. For each of the three dedicated power feeders out to each UV channel panelboard, the demand for each UV channel panelboard will be 239.5 kVA. This translates to a feeder size of 362A. Per the NEC, this will require one set of 4-500 KCMil, 1#3GND XHHW-2 copper conductors in a 4-inch conduit. Note that the upstream switchboard is 3ph, 4W, however the record drawings indicate the upstream generator nameplate is 3 ph, 3W, so there may need to be a transformer between the upstream switchboard and each UV area 480V panelboard when operating on backup power.

- For the proposed new Veolia system, the total connected load will be 837.5kVA. For each of the three dedicated power feeders out to each UV channel panelboard, the demand for each UV channel panelboard will be 279.2 kVA. For the Veolia system, unlike the previous two new proposed systems, a transformer will be required for each of the three new supply feeders to transform from 480-400/230V. The next size nominal transformer that can be selected is a 300 kVA. Thus, the supply feeder out to each of the three new UV areas will need to be based upon supplying a 300 kVA transformer. This translates to a feeder size of 452A. Per the NEC, this will require two sets of 3-#4/0AWG, 1#2GND XHHW-2 copper conductors in a 4-inch conduit.
- A single electrical building will feed the UV system and will require a dedicated 480V, 225A supply feeder (which is the equivalent of 150 kVA). This would be for heating, ventilation, and air conditioning equipment, lighting, etc. to support the building. Per the NEC, this will require one set of 3-#4/0, 1#4GND XHHW-2 copper conductors in a 4-inch conduit. Redundant six-pair fiber optic cables in 2-inch conduit will communicate between the UV/effluent MCC building and the new UV electrical building.

Electrical considerations are summarized in Table 16.

Table 16 **Electrical Summary**

Description	Trojan UVSigna (2-Row)	Wedeco Duron	Veolia Aquaray HiCAP
Total Connected Load (kVA)	532.5	718.4	837.5
Channel Panelboard Demand (kVA)	177.5	239.5	279.2
Feeder Size (Amps)	268	362	452
Conductors Needed	4 – 300KCMil 1 - #4GND XHHW-2	4 – 500 KCMil 1 - #3GND XHHW-2	2 sets 3 - #4/0 1 - #4GND XHHW-2
Transformer Required	Possibly	Possibly	Yes

3.3.5 Considerations for Construction Sequencing

The two layout options would require differing levels of complexity and risk during construction. For the retrofit option, there are several challenges that need to be accommodated. To construct the retrofit, one of the existing channels must be taken out of service to build the three new channels. Operations staff has noted that the facility often needs both channels during wet weather months. Therefore, construction of the new facility would need to be completed between April and October, a short construction window of only seven months. The current estimate for the construction timeline of the retrofit is seven to nine months, leaving very little, if any, float in the construction schedule.

Not only would completing the actual construction in the available time be challenging, the construction requires several long lead items including new electrical gear and new UV equipment. Delivery of these items would need to be coordinated with the construction schedule and any change extending the lead time would be detrimental to the ability to complete the project on time.

Testing and commissioning of the new UV system requires approval from the state. Therefore, the ability to use the new system is dependent on the responsiveness of the reviewers at the state, which is out of the control of the City.

Construction of the retrofit option would require a complicated isolation in the influent basin of the UV system involving temporary bulkheads. Once isolated, complicated construction would occur immediately adjacent to these bulkheads posing a risk to construction workers or City personnel if the bulkheads were compromised. Construction of the retrofit option would also occur adjacent to the remaining online UV channel. This increases the risk of construction debris, dust, or other contaminants to be introduced into the online UV channel putting compliance with the facility's permit at risk. In addition, the City has indicated that the remaining channel has had operational issues, and they do not feel that this channel is reliable.

The new facility sequencing considerations are straightforward. The whole facility can be constructed without taking any portion of the existing system offline. Influent and effluent piping tie-ins would be the only interaction between the existing and new systems. Any delays associated with equipment lead times or responsiveness from the state would not impact the ability of the WQCF to meet permit requirements as the existing system would remain online until the new system was commissioned and approved by DDW. A summary of the sequencing considerations for both options are included in Table 17.

Table 17 Sequencing Considerations

Option	Item	Risk
Retrofit	One channel must be offline for construction.	Lack of redundancy during construction.
	Operation limited to unreliable channel.	Permit violations during construction.
	Long lead times for equipment.	Delays to construction.
	Little to no float in construction.	Heading into wet weather with only one UV channel.
	DDW approval.	Not receiving approval in time for wet weather.
	Complicated isolation of existing influent channel.	Active construction adjacent to entire plant flow, potential for inadvertent contaminants.
New Structure	Facility can be constructed independently of existing UV channels.	No risk to existing process.
	Long lead time items can be incorporated into schedule.	Delays to construction.
	No need to have facility complete for wet weather.	No risk of entering wet weather with only one UV channel.
	DDW approval.	Approval not needed prior to wet weather.
	Tie-ins.	Relatively simple tie-ins with low risk.

3.3.6 Economic Evaluation

The equipment, O&M, and life cycle costs for the UV systems are compared below. Equipment costs were requested from the UV manufacturers and include the cost of the necessary reactor components, auxiliary equipment, spare parts, and start up and commissioning services.

3.3.6.1 Equipment Costs

The total equipment costs are:

- Trojan UVSigna 2-Row: \$2,980,000.
- Wedeco Duron: \$3,787,000.
- Veolia Aquaray HiCAP: \$2,450,000.

These costs include:

- All required UV modules/banks including lamps and support framework.
- Power cabling from UV lamps to ballast enclosures.
- Electrical panels.
- Automatic cleaning system.
- Lifting systems (except for Veolia Aquaray HiCAP).
- UV intensity sensors (one per bank).
- Online UVT analyzer.
- Level probes/sensors.
- Level control weirs.
- Inlet baffle plates.
- Spare parts.
- Factory testing, freight, O&M manuals, training, and field services onsite.

3.3.6.2 Operation and Maintenance Costs

The O&M cost basis and key factors for the NPV evaluation are shown in Table 15. The replacement costs for the individual components were provided by the manufacturers. The O&M cost analysis is based on average conditions (average flow rate of 9.87 mgd and average UVT of 65 percent). Assumptions for labor rate, electricity rate, inflation and discount are also included in Table 18.

Table 18 AA O&M Costs and Basis

Description	Trojan UVSigna (2-Row)	Wedeco Duron	Veolia Aquaray HiCAP
Lamp Replacement (each)	\$850	\$473	\$275
Ballast Replacement (each)	\$1,150	\$1,179	\$750
Wiper Replacement (each)	\$28	\$51	\$8
Sleeve Replacement (each)	\$230	\$641	\$75
Chemical Usage (annual cost)	\$1,000	\$1,000	\$1,000
UV Sensor Replacement (each)	\$1,160	\$1,197	\$1,850
Sensor Calibration (each)	\$750	\$450	\$1,500
Discount Rate	3.00%		
Inflation Rate	5.00%		
Project Life, years	20		

Description	Trojan UVSigna (2-Row)	Wedeco Duron	Veolia Aquaray HiCAP
Electricity Rate (per kWh)	\$0.230		
Labor Rate (per hour)	\$150.00		
Parts and Replacement Cost	\$137,833	\$311,868	\$107,068
Labor Cost	\$213,810	\$290,296	\$194,417
Energy Cost	\$271,741	\$382,087	\$481,789
AA Total	\$624,000	\$985,000	\$784,000

3.3.6.3 NPV Comparison

The NPV evaluation is summarized in Table 19. The NPV evaluation includes the capital costs which includes the equipment costs, parts and replacement costs, labor costs, energy costs, and O&M costs over a 20-year period.

Table 19 NPV Evaluation Summary

Equipment	UV Equipment Cost ⁽¹⁾	Parts and Replacement Cost	Labor Cost	Energy Cost	O&M Cost ⁽²⁾	Life Cycle Cost
Trojan UVSigna (2-Row)	2,980,000	137,833	213,810	271,741	624,000	\$18,347,000
Wedeco Duron	3,787,000	311,868	290,296	382,087	985,000	\$28,044,000
Veolia Aquaray HiCAP	2,450,000	107,068	194,417	481,789	784,000	\$21,757,000

Notes:

(1) Does not include construction costs.

(2) O&M costs are rounded up to the nearest hundred dollars.

Based on this analysis, the Trojan UVSigna 2-Row has the lowest annual O&M cost and life cycle cost and the Veolia Aquaray HiCAP system has the lowest equipment costs.

3.3.6.4 Overall Capital Construction Cost Estimates

Overall capital construction cost estimates were developed for each of the three suppliers. These initial cost estimates have been developed in accordance with Class 3 opinion of cost as defined by AACE International. Costs were developed using Carollo's unit cost database (features recent construction costs and references from RS Means) as well as UV manufacturer proposals and estimates from recent project experience. These estimates were categorized by demolition, structural work, mechanical work and equipment, electrical work, and instrumentation and controls.

A summary description of the indirect costs included in the estimates is provided below:

- Contingency: This is an amount added to the estimate to allow for changes within the current scope of the design that experience shows will likely be required. This includes estimator omissions (omissions related to estimating detailed costs at an early level of design). As the design matures, the contingency reduces. As the contingency reduces, the direct costs may increase as further detail is defined. A value of 30 percent has been used for this level of estimate (until detailed design).

- **General Contractor Overhead and Profit:** This cost is an amount allocated to each project to cover the cost of the contractor's main office operations, including the administration of subcontracts. This number typically ranges from 3 to 8 percent of the construction services. Contractor's profit can vary from approximately 4 to 10 percent on conventional design/bid/build contracts and could exceed 10 percent on projects delivered in an alternative manner such as design-build or construction manager at risk. The profit is applied to all construction costs on the project, including subcontractor work. A value of 18 percent of TDCs is recommended for this level of cost estimate.
- **Escalation to Mid-Point of Construction:** The cost of the project will be projected to the approximate midpoint of construction. The preferred technique for doing this is using historical cost indices as a basis for forecasting forward. The two historical sources that Carollo predominately uses are the Construction Cost Index published in Engineering News Record magazine, and the lesser known, but more applicable, Handy-Whitman Index of Public Utility Construction Costs. A value of 11.9 percent has been used for this level of estimate.
- **Bid Market Allowance:** This is the amount allocated to account for variation in the competitiveness of the bid market which can result in higher or lower costs based on the number of bidders. A value of 0 percent has been used for this level of estimate.
- **Total Estimated Construction Cost:** This value is the sum of the direct and indirect costs.

Capital cost estimates for the three options are:

- Trojan: \$12,923,000.
- Wedeco: \$16,092,000.
- Veolia: \$13,351,000.

Cost estimate summaries for each of these three options are provided in Appendix D.

3.4 Site Visit Summary

Because of the Trojan system overall cost saving, the City requested to visit reference facilities with operating installations to confirm the level of effort required for operation would not override the results of the economic evaluation. In November and December 2024 members of the project team traveled with plant staff to several operating Trojan UV facilities to see process equipment and speak with plant staff to understand O&M requirements. Facilities visited are summarized in Table 20. Both facilities reported being happy with the operation and maintenance of the Trojan UV systems.

Table 20 UV Site Visit Summary

Agency	Facility
City of Stockton, CA	City of Stockton RWCF
LOTT Clean Water Alliance, WA	Budd Inlet Treatment Plant

3.5 Recommended Alternative

Based on the analysis and confirmed at the site visits, the Trojan UVSigna (2-Row) is recommended to be the system used as the basis of design for the preliminary design phase. The Trojan UVSigna (2-Row) has the lowest annual O&M, life cycle, and construction costs. Drawings and specifications will be developed around this system. Procurement options have not been finalized in this conceptual design phase. During the preliminary design phase, a final decision will be made by the City regarding procurement.

APPENDIX A

SIDESTREAM COST ESTIMATES



PROJECT : Sidestream and UV Rehab Pre Design
CLIENT: City of Manteca
JOB # :

O&M Costs																
	Process			Power					Chemical			Maintenance	Labor			Total
	No. of Operating Units	No. of Standby Units	Motor Power (hp)	Total Operating Motor Power (hP)	Power Input (KW)	Operation Time (hr/day)	Annual KWh	Annual Power Cost	Usage (lb chemical/yr)	Unit Cost (\$/lb)	Chemical Cost (\$/year)	% Equipment Capital Cost per year	Labor hours (hr/day)	\$/hour	\$/yr	O&M Cost (\$/yr)
ANITA™ MOX																
EQ Basin																
Transfer Pumps	1	1	7.5	7.5	5.6	12	24,496	\$ 6,124								\$ 6,124
Mixers	1	0	9	9	6.7	6	14,698	\$ 3,674								\$ 3,674
Sidestream Basin																
Feed Pumps	1	1	7.5	7.5	5.6	24	48,992	\$ 12,248								\$ 12,248
Blowers	1	1	49	49.3	36.8	24	322,148	\$ 80,537								\$ 80,537
Mixers	1	0	9	9	6.7	6	14,698	\$ 3,674								\$ 3,674
Alkalinity Addition																
Feed Pumps	1	1	5	5	3.7	24	32,662	\$ 8,165								\$ 8,165
Alkalinity									315,446	\$ 0.2460	\$ 77,600					\$ 77,600
Operations													4	\$ 60	\$ 87,600	\$ 87,600
Maintenance (4%)												\$ 68,840				\$ 68,840
Total								\$ 114,424			\$ 77,600	\$ 68,840			\$ 87,600	\$ 349,000
DEMON																
EQ Basin																
Transfer Pumps	1	1	7.5	7.5	5.6	12	24,496	\$ 6,124								\$ 6,124
Mixers	1	0	9	9	6.7	6	14,698	\$ 3,674								\$ 3,674
Sidestream Basin																
Feed Pumps	1	1	7.5	7.5	5.6	24	48,992	\$ 12,248								\$ 12,248
Blowers	1	1	26	25.9	19.3	12	84,518	\$ 21,130								\$ 21,130
Mixers	1	0	9	9	6.7	6	14,698	\$ 3,674								\$ 3,674
Alkalinity Addition																
Feed Pumps	1	1	5	5	3.7	24	32,662	\$ 8,165								\$ 8,165
Alkalinity									385,926	\$ 0.2460	\$ 94,938					\$ 94,938
Operations													6	\$ 60	\$ 131,400	\$ 131,400
Maintenance (5%)												\$ 85,000				\$ 85,000
Total								\$ 55,016			\$ 94,938	\$ 85,000			\$ 131,400	\$ 367,000

ATTACHMENT 3



PROJECT : Sidestream and UV Rehab Pre Design
CLIENT: City of Manteca
JOB # :
ELEMENT #: 1
DESCRIPTION : ANITA™ MOX

ESTIMATE CLASS: 5
PREPARED BY: KR
DATE PREPARED:
REVIEWED BY:

DIVISION	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
SUMMARY OF CONSTRUCTION COSTS					
<u>2</u>	<u>Sitework</u>				
	Earthwork (excavation, offhaul, and backfill)				
	EQ Basin	57	CY	\$ 75	\$ 4,273
	Treatment Basin	150	CY	\$ 75	\$ 11,278
	Process Building	90	CY	\$ 75	\$ 6,750
	Chemical Storage Tank	27	CY	\$ 75	\$ 2,000
	Transfer Pump Station	149	CY	\$ 75	\$ 11,200
	Sidestream Pump Station	1	CY	\$ 75	\$ 56
	Piles	1	LS	\$ 233,000	\$ 233,000
	Total				\$ 268,557
<u>3</u>	<u>Concrete</u>				
	EQ Basin				
	Slab (24" thick)	23	CY	\$ 800	\$ 18,232
	Walls (24" thick)	87	CY	\$ 1,800	\$ 156,864
	Treatment Basin				
	Slab (24" thick)	60	CY	\$ 800	\$ 48,119
	Walls (24" thick)	177	CY	\$ 1,800	\$ 319,200
	Chemical Storage Tank				
	Slab (24" thick)	14	CY	\$ 800	\$ 11,085
	Walls (24" thick)	9	CY	\$ 1,800	\$ 16,000
	Transfer Pump Station				
	Slab (12" thick)	7	CY	\$ 800	\$ 5,807
	Walls (12" thick)	50	CY	\$ 1,800	\$ 89,600
	Sidestream Pump Station	18	CY	\$ 800	\$ 14,000
	Total				\$ 678,908
<u>4</u>	<u>Masonry</u>				
	Process Building	810	SF	\$ 750	\$ 607,500
	Total				\$ 607,500
	<u>Canopy</u>	432	SF	\$ 400	\$ 172,800
	Total				\$ 172,800
<u>11</u>	<u>Equipment</u>				
	AnitaMox	1	LS	\$ 1,271,000	\$ 1,271,000
	Mixer for EQ Basin	1		\$ 50,000	\$ 50,000
	Transfer Pumps	2		\$ 25,000	\$ 50,000
	Sidestream Pumps	2		\$ 25,000	\$ 50,000
	Chem Feed System (pumps, mixers)	1	LS	\$ 75,000	\$ 75,000
	Heat Exchangers	1		\$ 200,000	\$ 200,000
	Heat Loop Pump	1		\$ 25,000	\$ 25,000
	Total				\$ 1,721,000
	Installation Allowance	30%	%	Eq Cost	\$ 516,300
	Total				\$ 2,237,300
	<u>Metals</u>				
	Allowance	5%	%	Eq and New Structures	\$ 119,995
	<u>Electrical and Instrumentation</u>				
	Allowance	20%	%	TDC	\$ 1,256,942
	<u>Miscellaneous</u>				
	Yard Piping and Site Civil	15%	%	TDC	\$ 942,706
	SUBTOTAL EQUIPMENT AND ITEMIZED DIRECT COSTS				\$6,284,708

ATTACHMENT 3

	Estimating Contingency	30%	%	TDC	\$1,885,412
	SUBTOTAL				\$8,170,120
	General Conditions (Mobilization, Permits, Bonds/Insurance)	15.0%	%	TDC + Contingency	\$1,225,518
	SUBTOTAL				\$9,395,638
	Sales Tax	8.25%	%	50% of TDC	\$259,244
	SUBTOTAL				\$9,654,882
	General Contractor Overhead, & Profit	18%	%	DC + Contingency + GC + TDC	\$1,737,879
	SUBTOTAL				\$11,392,761
	Escalation to Midpoint	5.00%	%		\$12,560,519
	TOTAL CONSTRUCTION COST				\$12,570,000

ATTACHMENT 3



PROJECT : Sidestream and UV Rehab Pre Design
CLIENT: City of Manteca
JOB #:
ELEMENT #: 2
DESCRIPTION : DEMON®

ESTIMATE CLASS: 5
PREPARED BY: KR
DATE PREPARED:
REVIEWED BY:

ITEM	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
SUMMARY OF CONSTRUCTION COSTS					
2	Sitework				
	Earthwork (excavation, offhaul, and backfill)				
	EQ Basin	57	CY	\$ 75	\$ 4,273
	Treatment Basin	167	CY	\$ 75	\$ 12,500
	Process Building	90	CY	\$ 75	\$ 6,750
	Chemical Storage Tank	27	CY	\$ 75	\$ 2,000
	Transfer Pump Station	149	CY	\$ 75	\$ 11,200
	Sidestream Pump Station	1	CY	\$ 75	\$ 56
	Piles	1		\$ 233,000	\$ 233,000
	Total				\$ 269,779
3	Concrete				
	EQ Basin				\$ 18,232
	Slab (24" thick)	23	CY	\$ 800	\$ 156,864
	Walls (24" thick)	87	CY	\$ 1,800	
	Treatment Basin				\$ 53,333
	Slab (24" thick)	67	CY	\$ 800	\$ 336,000
	Walls (24" thick)	187	CY	\$ 1,800	
	Chemical Storage Tank				\$ 11,085
	Slab (24" thick)	14	CY	\$ 800	\$ 16,000
	Walls (24" thick)	9	CY	\$ 1,800	
	Transfer Pump Station				\$ 5,807
	Slab (12" thick)	7	CY	\$ 800	\$ 89,600
	Walls (12" thick)	50	CY	\$ 1,800	\$ 14,000
	Sidestream Pump Station	18	CY	\$ 800	\$ 700,923
	Total				
4	Masonry				\$ 607,500
	Process Building	810	SF	\$ 750	\$ 607,500
	Total				
					\$ 172,800
	Canopy	432	SF	\$ 400	\$ 172,800
	Total				
11	Equipment				
	DEMON	1	LS	\$ 1,300,000	\$ 1,300,000
	Mixer for EQ Basin	1		\$ 50,000	\$ 50,000
	Transfer Pumps	2		\$ 25,000	\$ 50,000
	Sidestream Pumps				
	Chem Feed System (pumps, mixers)	1	LS	\$ 75,000	\$ 75,000
	Heat Exchangers	1		\$ 200,000	\$ 200,000
	Heat Loop Pump	1		\$ 25,000	\$ 25,000
	Total				\$ 1,700,000
	Installation Allowance	30%	%	Eq Cost	\$ 510,000
	Total				\$ 2,210,000
	Metals				
	Allowance	5%	%	Eq and New Structures	\$ 120,046
	Electrical and Instrumentation				
	Allowance	20%	%	TDC	\$ 1,255,707
	Miscellaneous				
	Yard Piping and Site Civil	15%	%	TDC	\$ 941,780
	SUBTOTAL EQUIPMENT AND ITEMIZED DIRECT COSTS				\$6,278,535

ATTACHMENT 3

	Estimating Contingency	30%	%	TDC	\$1,883,561
	SUBTOTAL				\$8,162,096
	General Conditions (Mobilization, Permits, Bonds/Insurance)	15.0%	%	TDC + Contingency	\$1,224,314
	SUBTOTAL				\$9,386,410
	Sales Tax	8.25%	%	50% of TDC	\$258,990
	SUBTOTAL				\$9,645,400
	General Conditions, Contractor Overhead, & Profit	18%	%	DC + Contingency + GC + Ta	\$1,736,172
	SUBTOTAL				\$11,381,571
	Escalation to Midpoint	5.00%	%		\$12,548,182
	TOTAL CONSTRUCTION COST				\$12,550,000

APPENDIX B

UV PROPOSALS

PROPOSAL FOR MANTECA, CALIFORNIA
QUOTE: 247166
10/16/2024



TrojanUVSigna™ incorporates revolutionary innovations, including TrojanUV Solo Lamp™ technology, to reduce the total cost of ownership and drastically simplify operation and maintenance. It is the ideal solution for facilities wanting to upgrade their disinfection system easily and cost-effectively.

We are pleased to provide the enclosed TrojanUVSigna proposal. Please do not hesitate to contact us if you have any questions regarding this proposal. We look forward to working with you.

With best regards,

Jordan Fournier
Regional Manager
Trojan Technologies
jfournier@trojantechnologies.com
519-619-7352

DESIGN CRITERIA

Peak Design Flow:	31.08 MGD
Design UV Transmittance:	60% (minimum)
Total Suspended Solids:	5 mg/l (Maximum, grab sample)
Disinfection Limit:	2.20 Total Coliform per 100 ml, 7 day Median, 23 Total Coliform per 100 ml more than once in any 30-day period.
Dose:	102 mJ/cm² MS2 RED per 2012 NWRI UV Guidelines
Redundancy:	1 redundant bank per channel

DESIGN SUMMARY

CHANNEL (Refer to Trojan layout drawing for complete details)	
Number of Channels:	3
Minimum Channel Length Required:	50
Channel Width at UV Banks:	5.1
Channel Depth Recommended:	7.8
UV BANKS	
Number of Banks per Channel:	7 (6 duty, 1 redundant)
Number of Lamps per Bank:	22
Total Number of UV Lamps:	462 (Including 66 Redundant Lamps)
Maximum Duty Power Draw:	417 kW
UV PANELS	
Power Distribution Center Quantity:	9
Hydraulic System Center Quantity:	6
System Control Center Quantity:	1
ANCILLARY EQUIPMENT	
Level Controller Quantity and Type:	3 Weir Troughs
Integral Bank Walls:	Included
On-line UVT Monitoring:	Hach UVAS sc Sensor
Other Equipment:	
ELECTRICAL REQUIREMENTS	
- Each Power Distribution Center requires an electrical supply of one (1) 480/277V 60Hz, 3 Phase, 4 Wire + Ground, 71.2 kVA - Electrical supply for Hydraulic System Center will be (1) 480V 60Hz, 3 Phase, 3 Wire + Ground, 2.5 kVA - Electrical supply for System Control Center will be (1) 120V 60Hz, 1 Phase, 2 Wire + Ground, 1.8 kVA - The On-line UVT monitor requires (1) 120 Volts, 1 phase, 2 wire + ground, 1A - Electrical disconnects are not included in this proposal. Refer to local electrical codes	

COMMERCIAL INFORMATION

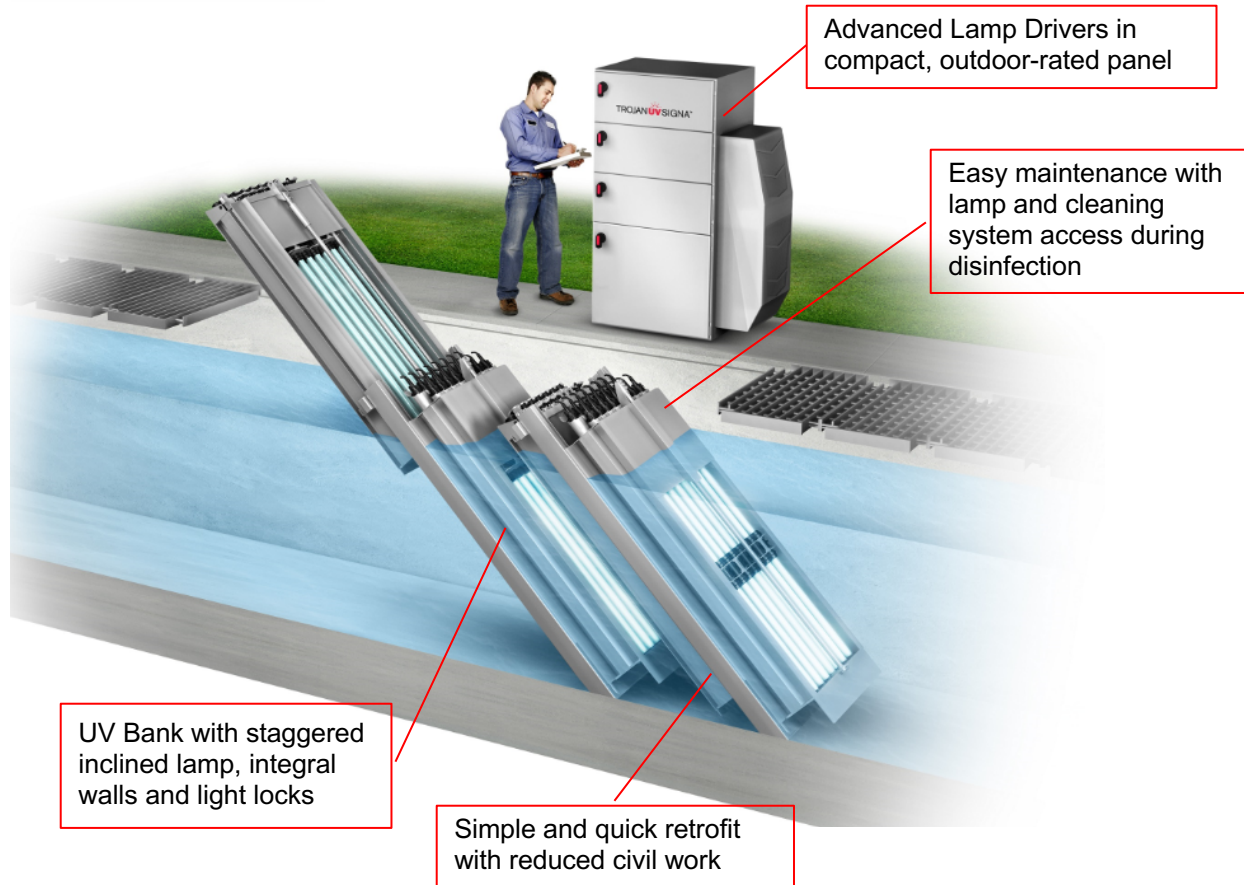
Total Capital Cost: \$ 3,050,500 (USD)

This price excludes any taxes or duties that may be applicable.
Standard equipment warranties and start up by Trojan-certified technicians are included.

Easy and Cost-Effective Maintenance

- The 1000 watt TrojanUV Solo Lamp combines the benefits of both low pressure and medium pressure lamps
- Fewer lamps, long lamp life and easy change-outs save time and money
- Lamp change-outs and cleaning solution replacement are done while the UV system is in the channel – minimizing downtime and simplifying maintenance
- Routine maintenance can be performed while banks are in the channel, but an Automatic Raising Mechanism (ARM) makes other tasks, such as winterization, simple, safe and easy
- Lamp plugs with LED status indicators and integral safety interlock prevent an operator from accidentally removing an energized lamp
- ActiClean WW™ chemical/mechanical cleaning system to keep sleeves clean during operation

SYSTEM OVERVIEW



Simple to Design and Install

- Light locks on the UV banks control water level within the channel, reducing dependence on downstream weirs and preventing short-circuiting above the lamp arc
- UV Banks include integral reactor walls to make installation easy and prevent short circuiting at the channel walls
- Stringent tolerances on concrete channel walls are not required – making retrofits simple and cost-effective

Supported by Trojan Technologies

- Trojan Technologies warrants all components of the system (excluding UV lamps) against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever comes first.
- UV lamps are warranted for 15,000 hours of operation or 3 years from shipment, whichever comes first. Lamp warranty is pro-rated after 9,000 hours of operation. This means that if a lamp fails prior to 9,000 hours of use, a new lamp is provided at no charge.
- Trojan offers an unparalleled Lifetime Performance Guarantee. The spirit of this guarantee is simple: the Trojan equipment, as sized for the project, will meet the disinfection requirements for the life of the system.



Budget Proposal

City of Manteca, CA



Prepared for:

Carollo
Bill Sotirakos

October 17, 2024

Xylem Water Solutions USA, Inc.
4828 Parkway Plaza Blvd Suite 200
Charlotte, NC 28217

October 17, 2024

City of Manteca, CA

Project Name: City of Manteca, CA
Project Number: J18010337822
Revision Number: 0

Dear Bill Sotirakos,

We are pleased to submit the following proposal for the City of Manteca, CA to replace the existing Wedeco TAK 55 system.

The Duron system is a modular open channel UV system that offers owners best in class operational efficiency and an entirely operator-oriented design. We would like to highlight a few key items with our proposal provided:

- **45° Vertical Incline Design** - WEDECO has used our 30+ years of experience in the UV industry to develop this staggered lamp array design, combining the advantages of vertical and horizontal designs. This design results in better hydraulics and performance.
- **Integrated Electric Lifting System** - This integrated device raises each module out of the channel individually, providing easy access to the entire UV module for inspection and routine maintenance. The existing overhead crane can be removed.
- **Simple maintenance** - With the Duron system, lamps and sleeves can be replaced right in the channel. The lifting system can bring the equipment to the operator, increasing safety. Additionally, no tools are needed for any maintenance procedure such as lamp changes, quartz removal, sensor replacement, or wiper ring replacement.
- **Latest lamp technology** - Our system includes our latest low-pressure, high-intensity Ecoray lamps which have a guaranteed life of 14,000 hours. At 600 watts per lamp, the Duron system also requires fewer lamps and associated replacement components.
- **Electric motor driven automatic wiping system** - This prevents quartz sleeve fouling with very easy replacement of wipers. It also eliminates the need for a compressor or a hydraulics system.
- **TotalCare** - WEDECO's established and proven TotalCare Program provides our customers with proactive services all designed to minimize the cost of ownership to operate and maintain a UV system. TotalCare services can provide our customers with system health checks, efficiency audits, training and preventative maintenance contracts.

Please refer to our local representative Mark Humberstone of Misco, (925) 785-1602 or us if you have any questions. We look forward to working with you on this exciting project.

Sincerely,

James Nielsen
Territory Manager
725-276-2167

Odelia Ryan
Applications Engineer

Table of Contents

1	Xylem Overview	4
2	General Process Description	6
2.1	Design	6
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4.1	Wedeco Scope of Supply	8
4.2	Budget Price	8
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6	Attachments	10

1 Xylem Overview

Xylem is a leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings. The company does business in more than 150 countries through a number of market-leading product brands, and its people bring broad applications expertise with a strong focus on finding local solutions to the world's most challenging water and wastewater problems.



Xylem's treatment business offers a portfolio of products and systems designed to effectively meet the demands and challenges of treating water and wastewater. From smarter aeration to advanced filtration to chemical-free disinfection, Xylem leverages its well-known Treatment brands, Flygt, Leopold, Sanitaire, and Wedeco, to offer hundreds of solutions backed by a comprehensive, integrated portfolio of services designed to ensure we can meet our customers' needs in a number of different industries including municipal water and wastewater, aquaculture, biogas and agriculture, food and beverages, pharmaceuticals, and mining.

Our scientists and engineers utilize their deep applications expertise and continually listen and learn from our customers' situations to create solutions that not only use less energy and reduce life-cycle costs, but also promote the smarter use of water.



Wedeco has accepted the challenge of the 21st century. With the Wedeco brand for UV Disinfection, ozone oxidation & AOP solutions, we own the advanced technologies for chemical-free and environmentally friendly treatment of drinking water, wastewater and process water as well as further industrial treatment processes. We constantly invest

a large portion of our energy in the development of high-tech components, systems and equipment, as well as in the study of new areas of application for UV, ozone & AOP. In doing so, we have always given special attention to the increase in energy efficiency of our Products equipped with our unique UV lamps and ozone electrodes.

ATTACHMENT 3

WEDECO

a xylem brand



The special characteristics of the Wedeco Ecoray UV lamp are its special doping and the unique long-life coating. Because of these features, a constantly high UV light yield is achieved with a substantially extended lamp service life at the same time. In addition, by using this technology it is not necessary to apply liquid mercury inside the lamp. Wedeco UV lamps cannot be surpassed in economic efficiency.

In relation to expenditure of energy, the High-Intensity/Low-Pressure Technology provides a light yield three times higher than comparable UV lamps of widely used Medium Pressure Technology. A higher light yield also means a lower heat generation at the same time.

Thanks to this, Wedeco UV lamps become less susceptible to varying water temperatures. Even the formation of deposits on the quartz sleeves as well as lamp aging is considerably lower than with alternative UV lamp technologies in Herford and Essen.



WEDECO Ecoray UV lamp



Xylem's Wedeco ozone systems combine maximum flexibility and reliable operating characteristics for small to large ozone capacities. The ozone generator system and control unit can be combined and supplemented with option sets that allow for various application requirements.

Effizon evo 2G ozone electrodes are the core of our technology and achieve an unmatched level of reliability and energy efficiency. The electrodes are manufactured completely from inert materials, without the need for fuses or coatings, making them highly resistant to corrosion. This means that the Wedeco ozone generators are practically maintenance free with no need for regular cleaning or replacement of the electrodes.

We rely on consistently high-quality standards in all divisions of the company. Moreover, product quality and manufacturing operations are constantly monitored and optimized in continuous improvement processes. Established quality controls give Xylem and you the security of knowing that Wedeco UV, Ozone & AOP systems will always operate reliably.

For more information please visit us at
<http://www.xylem.com/treatment/>



WEDECO Effizon® evo 2G
Ozone electrode

2 General Process Description

2.1 *Design*

- Design Flow Rates
 - Peak Design Flow 31.08 MGD
 - Average Design Flow 9.87 MGD
- Total Suspended Solids (Maximum) 5 mg/l
- Allowable Effluent Temperature Range 35-95°F
- UV Transmittance at 253.7 nm 60%, minimum
- Effluent Disinfection Standard
 - Total Coliforms (7 day geometric mean) 2.2 Total Coliforms/100 mL
 - Total Coliforms (more than once in any 30-day pd) 23 Total Coliforms/100 mL
 - Total Coliforms (max sample) 240 Total Coliforms/100 mL
- UV Dose
 - Minimum Design UV Dose (based on NWRI 2012 (MS2) bioassay) 102 mJ/cm²

2.2 *Process Description*

The proposed UV system is based upon the design criteria listed above and requires that all wastewater to be disinfected has previously undergone tertiary treatment. It is based on an NWRI 2012 MS2 UV Dose of 102 mJ/cm².

3 Technical Description

CONFIGURATION:		Duron 32 i 2 – 11 x 3 eW eL	
DESCRIPTION	UNITS	VALUE	
Total Number of lamps		1056	
Number of lamps per channel		352	
Number of channels		3	
Number of banks per channel		10+1	
Number of modules per bank		2	
Number of lamps per module		16	
CHANNEL DIMENSIONS:	Inches		
Width along UV banks		76.7	
Width along gate		76.7	
Design water depth @ influent		43.7	
Channel height w. bridgemounting		53.04	
Approx. length	Feet	65.3'	
HEADLOSS:	Inches		
Across UV system		2.7	
Across level control		2.8	
Allowable freefall		4.0	
Total Headloss		9.5	
POWER CONSUMPTION:	kW		
Total Connected System Power (All Lamps on @ 100% Power)		734.0	

4 Price & Scope of Supply

4.1 *Wedeco Scope of Supply*

- All required UV modules incl. lamps and support framework for installation of the UV modules
- 82 ft (25 m) power cabling from lamps to ballasts
- Control 48 Enclosure in Type 12, Fan-cooled, Painted Steel
- Modicon M340 PLC with HMI and SCADA communication
- Power supply requirements:
 - Ballast Enclosure(s): 480 V, 3 phase, 4 wire + ground (WYE)
 - ICA Enclosure: 120V, 1 phase.
- Electric motor driven automatic wiping system
- Integrated electric module lifting system
- UV-intensity sensors [one per bank]
- Low level probe [one per channel]
- YSI Online UV transmittance monitor
- OptiDose Dose-Pacing and lamp dimming control system
- Set of weir trough [one per channel]
- Spare parts
- Remote Service Support
- Three (3) operating and maintenance manuals in English language
- Factory testing of all parts and equipment prior to shipment
- Packaging & Freight to site
- Manufacturer's field services on site (5 trips / 25 site days)

4.2 *Budget Price*

Duron Standard Equipment	
Total	\$3,787,000

5 Commercial Terms & Conditions

Commercial Details	
Submittal time:	10-12 weeks after approved purchase order
Delivery time:	26-30 weeks after approved submittals
Terms of Delivery:	Incoterms 2020 DAP destination. Title and risk of loss will transfer to buyer upon delivery. Offloading and arrangement of the equipment is not included.
Terms of Payment:	This proposal is based upon WEDECO's General Terms of Business. Price is based upon the following payment terms (net 30 days): • 10% net 30 days upon initial submittal of mechanical/electrical drawings for approval • 80% net 30 days from the date of the respective shipments of the product • 5% installation of the Xylem equipment, NTE 150 days after shipment (whichever comes first) • 5% start-up / training on the Xylem equipment, NTE 180 days after shipment (whichever comes first)
Warranties:	Lamp Warranty: Guaranteed 14,000 hours of operation, prorated after 9,000 hours. System Warranty: 18 months from date of delivery or 12 months from date of substantial completion of UV equipment whichever comes first.



6 Attachments



Aquaray HiCAP®

**Ultraviolet Disinfection
Vertical Lamp System**

Budget Proposal

Manteca, CA

October 17, 2024

Contact information:

Prepared By:

**Veolia Water Technologies Treatment
Solutions USA, Inc.**
George Vrachimis
Tel : 201-676-2777
Email: george.vrachimis@veolia.com

Local Representative:

JB Water
Jim Zaiser
Email: jimzaiser@jbwater.com

October 17, 2024

To: Bill Sotirakos, P. Eng.
Carollo Engineers

Re: Aquaray HiCAP® Ultraviolet Disinfection System
Manteca, CA

Veolia is pleased to submit our preliminary budget proposal for the Aquaray HiCAP® Vertical Lamp ultraviolet disinfection system for the above referenced project. The proposed design is based on our Aquaray HiCAP® System which features vertically mounted, high output 1,000 watt amalgam lamps with variable output for greater power conservation

Some of the proposed Aquaray HiCAP® Vertical Lamp UV System's features include:

- 1000 watt LPHO Amalgam UV lamps to reduce lamp count and equipment footprint
- Third Party Validated
- Easy maintenance without the need to remove equipment from channel for lamp and ballast replacement.
- Automatic dose control is achieved by turning on/off lamps row by row in combination with dimming each lamp in response to a flow signal, ensuring that the plant is operated economically while still providing the required performance.
- IP68 Rated for Submergence

For a peak flow of 31.08 MGD and a UV transmittance of 60%, Veolia proposes to furnish three (3) UV disinfection channels. The proposed UV system will have UV modules, each with 36 lamps, mounted one (1) across by seven (7) UV banks in series for a total of twenty-one (21) UV modules. The UV system will deliver a minimum UV MS2 RED of 102 mJ/cm² at the peak flow with one (1) UV bank out of service per channel.

If you have any questions or require any additional information, please don't hesitate to contact our local representative or the undersigned.

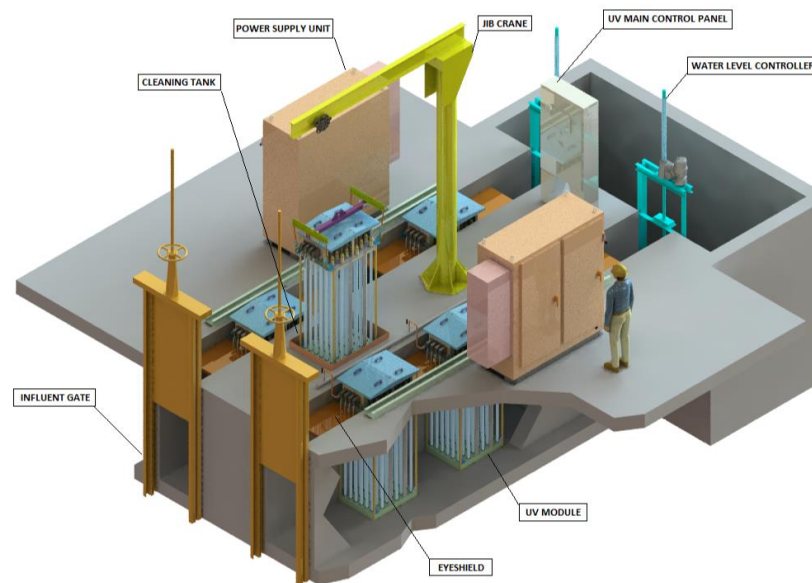
Sincerely,

For VEOLIA Water Technologies Treatment Solutions USA, Inc.

A handwritten signature in black ink, appearing to read 'George Vrachimis', with a stylized, cursive script.

George Vrachimis

I. AQUARAY® HiCAP VERTICAL LAMP SYSTEM DESCRIPTION



- The Aquaray® HiCAP's vertical open channel type configuration, unique staggered lamp array and perpendicular flow enables the plant operators to service the system with ease and simplicity.
- The UV lamps are mounted vertically and perpendicular to the flow, where all electrical connections are made out of the water. All the lamps are easily accessed through the lid of the top enclosure. This makes routine service such as lamp changes, performed without having to remove the lamp modules from the channel.
- Electronics, such as ballasts and communication cards, are all located in a remote enclosure away from the UV channel
- The UV lamps are mounted in a uniform staggered array. This ensures a semi-tortuous path for the effluent that avoids discharge of undisinfected wastewater.
- Flow pacing is achieved by a combination of dimming each row of lamps from 100% down to 40% output and turning lamp rows on and off in relation to a plant flow signal. Each UV module has four (4) rows of lamps arranged asymmettrically to assure a tortuous flow path that enhances overall dose applied while insuring significant backmixing that yields better inactivation than other designs.
- Each UV module has a dedicated electric motor that powers a simple mechanical wiper plate mounted on an acme screw drive. No failure of one wiping system component will result in the loss of wiping capability for the entire UV system.
- All UV modules are completely removable from the UV channel, allowing for regularly scheduled channel cleaning to remove algae or debris.

HIGH OUTPUT LAMP ARRANGEMENT:

The ultraviolet lamps are mounted vertically so that all electrical connections are made out of the water and within the protection of an IP68 stainless steel enclosure. Unlike other designs, all the lamps are easily accessed through the lid of this enclosure. Therefore, routine service such as lamp changes can be made without having to remove the lamp modules from the channel.

The lamps are also mounted in a uniform staggered array, This ensures a semi-tortuous path so that every particle of water will come into intimate contact with the most intense point of lamp output.

MODULE ARRANGEMENT:

The number and layout of the modules within the channel is determined based on the required UV dosage and a UV path for the water that eliminates any possibility of hydraulic short-circuiting. See “DESIGN BRIEF” for details of module arrangement for this project



CONTROL AND MONITORING:

Each HiCAP module in the disinfection system receives its power from the Power Supply Unit via power cables provided by Veolia. A separate MCP (Main Control Panel) houses the PLC and Operator Interface (OI/HMI). The system operates in the fully automatic mode and the HMI displays up-to-date information about the status of the equipment. It requires no previous computer experience and includes easy to understand on-screen instruction to assist the operators.

The HMI shows the number of modules in service and the number of lamps within the modules that are in use. Information that is used to determine the number of lamps required can be taken from a modified flow signal. The modified flow signal (by owner) for control over each channel can be calculated from the overall plant flow.

A representative UV intensity reading is displayed continuously on the OI based on information being received from a sensor mounted in each bank of modules.





UV CHANNEL CONTROL

11/26/2019 10:31:28 AM

REMOTE

LOCAL

OFFLINE

LOCAL

DEMAND ON

IN SERVICE

START

STOP

Design Dose: 30.00 mJ/cm2

Actual Dose: 0.00 mJ/cm2

Target Dose 0.00 mJ/cm2

CHANNEL ALARM ACKNOWLEDGE

CLEANING SYSTEM

FORCE AUTO CLEANING CYCLE

Cleaning Interval

24 Hrs

Cleaning Spacing

45 Min

Time to Next Autoclean

1409 Min

Bank in Cleaning

3

BANK MANAGEMENT

Lead Bank No.:

1

Rotation Time

10 Days

Time To Next Rotation

10 Days

Force Lead Bank No. (0= AutoTime)

1

Rows Required to Meet Dose

0

Rows Available for Dosing

0

Rows Considered Dosing

0

Lamps Faulted

0

Rows Considered unavailable

8

Row Minimum Run Time

360 Min

Rows On

0

Lamps On

0

PLANT OVERVIEW

UV MODULES OVERVIEW

UV CHANNEL CONTROL

TOOLS

ALARM SUMMARY

LOGIN

LOGOUT OZONIA

Should it become necessary, the operator can assume manual control of the system. In this mode, he or she has the ability to check all the system functions and to control the lamp array.

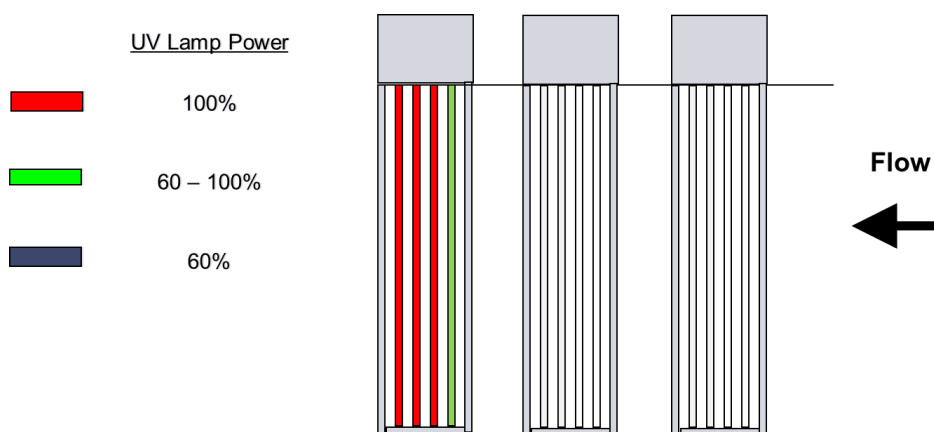
Other system information, such as channel flow and individual module status, can also be accessed.

FLOW PACING:

Due to the wide variety of flows that occur in a wastewater treatment plant, the Aquaray® HiCAP Vertical Lamp System is designed to minimize energy consumption and extend lamp life by accurately controlling the number and outputs of lamps in service. The **Aquaray® HiCAP System** incorporates a unique way of conserving energy via a combination of **turning on/off and dimming of UV lamps**.

This feature allows the system to switch on or off lamps and vary between lamp output power levels in response to the flow pattern of the wastewater treatment plant via the 4-20mA signal received from the plant flow meter and UVT analyzer.

During the diurnal flows described, the UV system will respond to the change in flows by turning on/off lamps on a row-by-row basis then dimming each row as needed from 60-100% lamp power.



SYSTEM CLEANING:

Any UV system gradually accumulates a coating on the quartz sleeves housing the lamps. This routine fouling must be removed periodically.

The Aquaray® HiCAP System offers a fully automatic, in-channel cleaning system which reduces maintenance.

The automatic wiping system is usually operated once daily and the wipers are then replaced once every two years. This system is included in our proposal.

The wipers are individually replaceable split nylon brushes with adjustable compression rings to allow for optimum wiper contact as the brush wears over time.



SERVICE:

Every piece of equipment within a wastewater plant requires service. The Aquaray® HiCAP System has been developed to permit easy troubleshooting and quick replacement of components. The majority of maintenance activities can be carried out while the equipment is still located within the channel. The recommended spares included in this proposal will ensure that the system can be maintained efficiently and brought back to full operation in the shortest possible time.



II. DESIGN BRIEF

Parameter	Value	Units
Peak Hour Flow	31.08	MGD
Average Daily Flow	9.87	MGD
Design UV Transmittance	60	% UVT
Average UV Transmittance	65	% UVT
TSS, sample maximum	<5	mg/L
Total Coliform, 7-day median	<2.2	MPN/100 mL
Total Coliform, more than once in any 30-day period	<23	MPN/100 mL
Total Coliform, at any time	<240	MPN/100 mL
MS2 RED	102	mJ/cm ²

III. PROPOSED AQUARAY® HiCAP SUBMERSIBLE VERTICAL LAMP SYSTEM DESIGN:

Description	Phase 1
System Designation	Aquaray® HiCAP
Number of Channels	3
Number of Modules Across (Modules per Bank)	1
Number of Modules in Series (# of Banks)	7 (6 duty + 1 standby)
Channel Width, in.	47.5"
Channel Length, ft.	43' – 2"
Minimum Channel Depth, in.	91"
Nominal Water Depth, in.	74-82"
Aquaray® Modules/Channel	7
Total Number of Modules	21
Number of Lamps/Module	36
Total Number of Lamps	756
Headloss at 31.08 MGD	1.89 in.
Power Consumption per Lamp, W	1000 watts
Power Consumption at 31.08 MGD and 60% UVT, kW	637.2 kW
Power Consumption at 9.87 MGD and 65% UVT, kW Through 1 channel	150.4 kW
Max Operating Power, kW (All Equipment)	818.7 kW
Power Feed Requirement	480V/3ph/60Hz

IV. SCOPE OF SUPPLY

UV System Component	Quantity
Number of Aquaray® HiCAP Modules - IP68 316SS	21
Total Number of UV Lamps (Excluding Spares)	756
Number of UV Intensity Sensors (One per bank)	21
Number of Power Supply Units (PSUs) NEMA 12, Painted Steel	6
Number of UV Main Control Panels (UMCPs) - Schneider Electric Modicon M340 PLC and Schneider Electric HMI - NEMA 12, Painted Steel	1
Number of Remote HMI Panels	1
Number of Power Cables	126
Number of Data Cables	63
Number of Cable Trays	3
Number of Stepdown Transformers	6
Number of Mounting Rails/Eye Shields	24
Number of Conductivity Level Switches	4 (1 per channel and 1 for the inlet basin)
Number of Online UVT Analyzers	1
Number of Level Control Weirs 316 SS	1 set
Number of Motorized Inlet Isolation Gates	3
Number of Inlet Baffle Plates	3
Spares 10% lamps 10% sleeves 1 UV sensor 10% Wipers 5% Ballasts - Citric acid - Operators Kit (UV goggles, UV warning signs, gloves)	
Field Service	10 days in 2 trips
Freight to job site	Included

V. ITEMS PROVIDED BY OTHERS

Note that the following items are to be provided by others (unless indicated otherwise above):

- UV channel construction
- Channel grating
- Any Piping and Channel Drains
- Remote computer system
- Removal of existing equipment
- Installation of the equipment
- Integration with the SCADA system
- Pulling of all cables and interconnecting of cables at the PSUs
- 4-20 mA Signals
- Embedded conduits
- The cost for the laboratory analysis during the performance testing, including the cost of collection, transportation, laboratory analysis of effluent samples, materials, and equipment, is the responsibility of the contractor
- Power feed 480V/3ph/60Hz
- 1/2-Ton Jib or Overhead Crane

VI. PRICING, TERMS AND CONDITIONS

Budget Price	See RFQ Form
Taxes	Not included
Payment Terms	• 10% Net Cash, Payable in thirty (30) days from date of submittal of initial drawings for approval; • 85% Net Cash, Payable in progress payments thirty (30) days from dates of respective shipments of the Products; • 5% Net Cash, Payable in thirty (30) days from Product installation and acceptance or Ninety (90)
Submittals	8-10 weeks
Equipment Delivery	22-24 weeks after submittal approval
Freight	INCOTERMS DAP
Warranty	1 year after start-up or 18 months after delivery, whichever occurs first

Typical Aquaray® Vertical Lamp Ultraviolet Disinfection System Installations



Plant Location: Auburn, NY

Peak Flow: 25 MGD

Number of Channels: 1

Number of Modules: 3

Aquaray® HiCAP Vertical Lamps

Ultraviolet Disinfection System Installations



Plant Location: Doha I, Qatar

Peak Flow: 40 MGD HLD for Reuse

Number of Channels: 1

Number of Modules: 3 per bank (24 total)

Mateca, CA
Date: October 17, 2024

Aquaray® HiCAP Vertical Lamps

Ultraviolet Disinfection System Installations



Plant Location: Doha II, Qatar

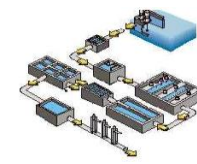
Peak Flow: 60 MGD

Number of Channels: 3

Number of Modules: 10 per channel (30 total)

APPENDIX C

UV HYDRAULIC CALCULATIONS



PROJECT : Manteca UV Rehabilitation Preliminary Design
 UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331

REVISION: 1

CHECKED : _____
DATE : _____

BY : ARL
DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, through a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set

DOWNSTREAM CONTROL

EGL =	33.20
Flow =	31.08 mgd = 48.08 cfs

Just below High alarm (33.3) in Effluent Pump Station
 per 2011 Set: Sheet G1.23

Equation Ref.	HGL	EGL
---------------	-----	-----

UV Effluent Pipe from UV Effluent Channel to Existing Effluent Pump Station Wet Well

[PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)]

{ 4 }

Flow	31.1	mgd =	48.1	cfs
Pipe Diameter, D	48	inch		
Pipe Length, L	35	ft		
Absolute Roughness, ϵ	0.00040	ft		
Pipe velocity, v	3.83	fps		
Kinematic Viscosity	1.000E-05	ft ² /sec		
Reynold's Number, R	1530458			
Friction factor, f	0.0130			
			Equivalent Hazen-Williams "C" =	143.1158
Friction Energy Loss, h_L	0.03	ft		

MINOR PIPE LOSS HEADING

Flow, Q 31.1 mgd = 48.1 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Entrance Loss - Flush	31.08	48.08	0.50	----	48	----	3.83	0.23	0.11
0	Mitre Bend - 45 ° Deflection	31.08	48.08	0.32	48	----	3.83	----	0.23	0.00
1	Outlet Loss - Still Water	31.08	48.08	1.00	48	----	3.83	----	0.23	0.23
									Sum =	0.34

Total Energy Loss = 0.37 ft

Upstream Condition

33.57 33.57

UV Effluent Channel downstream of UV Channel effluent weirs

[CHANNEL FRICTION LOSSES]

{ 5 }

Flow, Q	31.08	mgd =	48.1	cfs
Channel Width	8.00	ft		
Total Channel Length	30.00			
Downstream Invert EI	29.34			
Channel Slope	0.50%			
Manning Coeff, n	0.013			

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	29.34	29.34	4.19	1.433	2.05	0.000	----	----	33.53	33.57
6.0	29.37	29.34	4.16	1.443	2.04	0.000	0.000	0.00	33.53	33.57
12.0	29.40	29.37	4.13	1.454	2.03	0.000	0.000	0.00	33.53	33.57
18.0	29.43	29.40	4.10	1.464	2.03	0.000	0.000	0.00	33.53	33.57
24.0	29.46	29.43	4.07	1.475	2.02	0.000	0.000	0.00	33.53	33.57
30.0	29.49	29.46	4.04	1.486	2.01	0.000	0.000	0.00	33.53	33.57

TOTAL ENERGY LOSS 0.00 ft

Condition at Upstream End of Channel

33.53 33.57

PROJECT : Manteca UV Rehabilitation Preliminary Design

UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331

REVISION: 1

CHECKED :
DATE :

BY : ARL
DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, through a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set
UV effluent Weirs for each UV channel, with even split flow over all 3 channel weirs

FLOW SPLI

Downstream Flow31.1mgd = 48.1 cfs

New Flow10.4mgd = 16.0 cfs

STRAIGHT EDGED SHARP CRESTED WEIR

Flow10.4mgd = 16.0 cfs

WSE Downstream of Weir33.53ft

Weir Crest Elevation33.70ft

Downstream head, Hd-0.17ft

Length of Weir, L42.00ft

WEIR IS FREE-DISCHARGING

Free Discharging Weir Computation

Head on Weir, H0.24ft

Upstream WSE33.94ft

Submerged Weir Computation

KNA

MNA

IncrementNAft

Upstream Head, Hu1NAft

F(H1)NA

F'(H1)NA

Upstream Head, Hu2NAft

Upstream WSENAft

Head over Weir0.24ft

Condition Upstream of Weir

33.94

33.94

Individual UV Channel

CHANNEL FRICTION LOSSES

Flow, Q10.36mgd = 16.0 cfs

Channel Width4.75ft

Total Channel Length52.00

Downstream Invert EI27.00

Channel Slope0.00%

Manning Coeff, n0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	27.00	27.00	6.93	0.487	1.77	0.000	----	----	33.93	33.94
10.4	27.00	27.00	6.93	0.487	1.77	0.000	0.000	0.00	33.93	33.94
20.8	27.00	27.00	6.93	0.487	1.77	0.000	0.000	0.00	33.93	33.94
31.2	27.00	27.00	6.93	0.487	1.77	0.000	0.000	0.00	33.93	33.94
41.6	27.00	27.00	6.93	0.487	1.77	0.000	0.000	0.00	33.93	33.94
52.0	27.00	27.00	6.93	0.487	1.77	0.000	0.000	0.00	33.93	33.94

TOTAL ENERGY LOSS0.00ft

Condition at Upstream End of Channel

33.93

33.94

UV Banks

MINOR CHANNEL LOSS HEADING

Flow, Q10.4mgd = 16.0 cfs

FlowFlow

Width UpWidth DownDepth

Vel UpVel DownVel Head

Minor Loss

PROJECT : Manteca UV Rehabilitation Preliminary Design
UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331 REVISION: 1

CHECKED : BY : ARL
DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, through a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set

No.	Description	(mgd)	(cfs)	K	(ft)	(ft)	(ft)	(fps)	(fps)	(ft)	(ft)	
1	UV Headloss	10.36	16.03	62.00	4.75	----	6.93	0.49	----	0.00	0.23	
1	Baffle Headloss	10.36	16.03	46.00	4.75	----	6.93	0.49	----	0.00	0.17	
										Sum =	0.23	
Total Energy Loss =		0.23 ft										
Upstream Condition											34.16	34.16
UV Channel Inlet Gate												
[SUBMERGED GATE - RECTANGULAR OPENING]											{ 14 }	
Flow, Q	10.4	mgd =		16.0		cfs						
Gate Width	4.75	ft										
Full Height of Opening	6	ft										
Gate Percent Open	100%											
Discharge Coefficient, C	0.61											
Velocity through gate, v	0.56 fps											
Energy Loss thru Gate, h _L	0.01 ft											
Condition Upstream of Gate											34.18	34.18
Combined UV Inlet Box upstream of UV Channels, with even flow split for all 3 channels.												
FLOW SPLIT												
Downstream Flow	10.4	mgd =		16.0		cfs						
New Flow	31.1	mgd =		48.1		cfs						
[CHANNEL FRICTION LOSSES]											{ 5 }	
Flow, Q	31.08	mgd =		48.1		cfs						
Channel Width	8.00	ft										
Total Channel Length	15.00											
Downstream Invert El	27.00											
Channel Slope	-0.50%											
Manning Coeff, n	0.013											
Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL		
0.0	27.00	27.00	7.17	0.839	2.57	0.000	----	----	34.17	34.18		
3.0	26.99	27.00	7.18	0.837	2.57	0.000	0.000	0.00	34.17	34.18		
6.0	26.97	26.99	7.20	0.835	2.57	0.000	0.000	0.00	34.17	34.18		
9.0	26.96	26.97	7.21	0.833	2.57	0.000	0.000	0.00	34.17	34.18		
12.0	26.94	26.96	7.23	0.832	2.57	0.000	0.000	0.00	34.17	34.18		
15.0	26.93	26.94	7.24	0.830	2.58	0.000	0.000	0.00	34.17	34.18		
TOTAL ENERGY LOSS		0.00 ft										
Condition at Upstream End of Channel											34.17	34.18
NEW 48" FTE From Plant Split (Existing tert filters and future membrane) through UV Meter and to UV Structure Inlet												
[PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)]											{ 4 }	
Flow	31.1	mgd =		48.1		cfs						
Pipe Diameter, D	48	inch										
Pipe Length, L	125	ft										
Absolute Roughness, ε	0.00040	ft										
Pipe velocity, v	3.83 fps											
Kinematic Viscosity	1.000E-05	ft ² /sec										
Reynold's Number, R	1530458											
Friction factor, f	0.0130	Equivalent Hazen-Williams "C" =									143.1158	

PROJECT : Manteca UV Rehabilitation Preliminary Design

UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331

REVISION: 1

CHECKED :

DATE :

BY : ARL

DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, through a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set

Friction Energy Loss, h_L

0.09 ft

MINOR PIPE LOSS HEADING

Flow, Q

31.1

mgd = 48.1 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
0	Mitre Bend - 90 ° Deflection	31.08	48.08	1.27	48	----	3.83	----	0.23	0.00
4	Mitre Bend - 45 ° Deflection	31.08	48.08	0.32	48	----	3.83	----	0.23	0.29
2	Reducer	31.08	48.08	0.25	42	48	5.00	3.83	0.23	0.11
0	Wye - Thru Side Outlet	31.08	48.08	1.35	48	----	3.83	----	0.23	0.00
1	Butterfly Valve (Open)	31.08	48.08	0.50	48	----	3.83	----	0.23	0.11
2	Wye - Thru Straight Run	31.08	48.08	0.45	48	----	3.83	----	0.23	0.20
0	Tee - Thru Straight Run	31.08	48.08	0.60	48	----	3.83	----	0.23	0.00
1	Outlet Loss - Still Water	31.08	48.08	1.00	48	----	3.83	----	0.23	0.23
0	Entrance Loss - Flush	31.08	48.08	0.50	----	48	----	3.83	0.23	0.00
Sum =									0.95	

Total Energy Loss =

1.04 ft

Upstream Condition

35.22

35.22

(EXISTING) 42" FTE from Filter Effluent Header to Plant Split. Peak flow from filters per 2011 set sheet G1.21

PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)

{ 4 }

Flow

19.1

mgd = 29.6 cfs

Pipe Diameter, D

42

inch

Pipe Length, L

55

ft

Absolute Roughness, ϵ

0.00040

ft

Pipe velocity, v

3.08

fps

Kinematic Viscosity

1.000E-05

ft²/sec

Reynold's Number, R

1077145

Friction factor, f

0.0136

Equivalent Hazen-Williams "C" = 144.1528

Friction Energy Loss, h_L

0.03 ft

MINOR PIPE LOSS HEADING

Flow, Q

19.1

mgd = 29.6 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Reducer	19.14	29.61	0.25	42	48	3.08	2.36	0.09	0.02
0	Wye - Thru Side Outlet	19.14	29.61	1.35	42	----	3.08	----	0.15	0.00
0	Wye - Thru Straight Run	19.14	29.61	0.45	42	----	3.08	----	0.15	0.00
1	Tee - Thru Side Outlet	19.14	29.61	1.80	42	----	3.08	----	0.15	0.26
0	Tee - Thru Straight Run	19.14	29.61	0.60	42	----	3.08	----	0.15	0.00
Sum =									0.29	

Total Energy Loss =

0.32 ft

Upstream Condition

35.54

35.54

(EXISTING) 30" Filter Effluent to 42" FTE

FLOW SPLIT

Downstream Flow

19.1

mgd = 29.6 cfs

New Flow

9.6

mgd = 14.8 cfs

PROJECT : Manteca UV Rehabilitation Preliminary Design

UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331

REVISION: 1

CHECKED :
DATE :

BY : ARL
DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, through a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set

PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)

Flow	9.6	mgd =	14.8	cfs
Pipe Diameter, D	30	inch		
Pipe Length, L	19	ft		
Absolute Roughness, ε	0.00040	ft		
Pipe velocity, v	3.02	fps		
Kinematic Viscosity	1.000E-05	ft ² /sec		
Reynold's Number, R	754002			
Friction factor, f	0.0145		Equivalent Hazen-Williams "C" =	143.4087
Friction Energy Loss, h _L	0.02	ft		

MINOR PIPE LOSS HEADING

Flow, Q		9.6	mgd =		14.8		cfs			
No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Reducer	9.57	14.80	0.25	42	30	1.54	3.02	0.14	0.04
2	Tee - Thru Straight Run	9.57	14.80	0.60	30	----	3.02	----	0.14	0.17
									Sum =	0.20
Total Energy Loss =		0.22 ft								

Upstream Condition

35.76

35.76

24" Filter Effluent to 30" FTE

FLOW SPLIT

Downstream Flow	9.6	mgd =	14.8	cfs
New Flow	3.2	mgd =	4.9	cfs

PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)

Flow	3.2	mgd =	4.9	cfs
Pipe Diameter, D	24	inch		
Pipe Length, L	40	ft		
Absolute Roughness, ε	0.00040	ft		
Pipe velocity, v	1.57	fps		
Kinematic Viscosity	1.000E-05	ft ² /sec		
Reynold's Number, R	314167			
Friction factor, f	0.0162		Equivalent Hazen-Williams "C" =	145.5242
Friction Energy Loss, h _L	0.01	ft		

MINOR PIPE LOSS HEADING

Flow, Q		3.2	mgd =		4.9		cfs			
No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Tee - Thru Side Outlet	3.19	4.93	1.80	24	----	1.57	----	0.04	0.07
1	Reducer	3.19	4.93	0.25	30	24	1.01	1.57	0.04	0.01

PROJECT : Manteca UV Rehabilitation Preliminary Design

UV Hydraulic Analysis from Tertiary Filters to Effluent Pump Station

JOB # : 203331

REVISION: 1

CHECKED :
DATE :

BY : ARL
DATE : 1/9/2025

This sheet calculates HGL and EGL from the tertiary filter effluent weirs, throug a new flow meter vault, through a new 3 channel UV structure, over UV weirs, and into the existing pump station

All values are based on the 2011 Record Set

1	Butterfly Valve (Open)	3.19	4.93	0.50	24	----	1.57	----	0.04	0.02
1	Entrance Loss - Flush	3.19	4.93	0.50	----	24	----	1.57	0.04	0.02
1	Mitre Bend - 90 ° Deflection	3.19	4.93	1.27	24	----	1.57	----	0.04	0.05
Sum =										0.17

Total Energy Loss = 0.18 ft

Upstream Condition		35.94	35.94
Filter Weir		35.82	
Target		35.21	
		-0.73	

See the 2011 Set, sheet G1.23 for filter effluent weir elevation and discharge elevation

APPENDIX D

UV COST ESTIMATES

PROJECT SUMMARY

Project: Manteca UV Rehabilitation - Trojan
Client: City of Manteca
Location: Manteca, CA
Zip Code: 95337

Estimate Class:

PIC: Ryan Sellman
PM: Stephen Caswell
Date: January 9, 2025
By: ARL

Carollo Job # 203331

Reviewed:

NO.	DESCRIPTION	TOTAL
01	Demolition	\$3,716
02	Civil	\$247,481
03	Structural	\$1,458,073
04	Mechanical	\$3,590,011
05	Electrical	\$1,309,024
TOTAL DIRECT COST		\$6,608,304
	General Conditions	15.0% \$991,246
	Subtotal	\$7,599,550
	Contingency	30.0% \$1,982,491
	Subtotal	\$9,582,041
	General Contractor Overhead, Profit & Risk	18.0% \$1,724,767
	Subtotal	\$11,306,809
	Escalation to Mid-Point	11.9% \$1,343,370
	Subtotal	\$12,650,179
	Manteca Sales Tax (50% on Material only)	8.3% \$272,593
	Subtotal	\$12,922,772
	Bid Market Allowance	0.0% \$0
TOTAL ESTIMATED CONSTRUCTION COST		\$12,922,772
	Engineering, Legal & Administration Fees	0.0% \$0
	Owner's Reserve for Change Orders	0.0% \$0
TOTAL ESTIMATED PROJECT COST		\$12,922,772
<i>The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Carollo Engineers have no control over variances in the cost of labor, materials, equipment; nor services provided by others, contractor's means and methods of executing the work or of determining prices, competitive bidding or market conditions, practices or bidding strategies. Carollo Engineers cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented as shown.</i>		

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Trojan
Client: City of Manteca
Location: Manteca, CA
Element: 02 Demolition

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02220	12" Concrete Pipe Rem From An Open Trench	60	LF	\$5.45	\$327	
02220	Demo Concrete Walls, Heavy Rebar, 12"	40.5	SF	\$26.45	\$1,071	
02220	Remove 4"-6" Asphalt Pavement	3000	SF	\$.77	\$2,318	
Total						\$3,716
Grand Total						\$3,716

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Trojan
 Client: City of Manteca
 Location: Manteca, CA
 Element: 03 Civil

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02260	Solid Shoring, 16' D, Wood Planks, Stringers & X-Bracing	400	LF	\$123.50	\$49,399	
02300	Native Pipe Bed & Zone/Confined Structure Backfill, Class B Material	296.3	CY	\$37.72	\$11,176	
02300	Imported Pipe Bed & Zone/Confined Structure Backfill, Class A Material	88.89	CY	\$59.07	\$5,250	
02300	Cat 225 Trackhoe, 2Cy Bucket, Class B (Medium Digging), 0-16' D	385.19	CY	\$2.75	\$1,058	
02580	48" Precast Manhole, Xtra Depth Over 8'	10	VLF	\$328.10	\$3,281	
02580	48" X 8' Deep Precast Manhole, No Ring, Cover, Earthwork, Top Or Bottom Slab	2	EA	\$3,247.92	\$6,496	
02742	4" Ac Paving On 8" Abc	666.67	SY	\$62.09	\$41,392	
Total						\$118,052
Division 15 - Mechanical						
15249	18" Sdr-26 Pvc Sewer Pipe, In Trench	200	LF	\$170.61	\$34,121	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	80	LF	\$794.23	\$63,538	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	40	LF	\$794.23	\$31,769	
Total						\$129,429
Grand Total						\$247,481

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Trojan
 Client: City of Manteca
 Location: Manteca, CA
 Element: 04 Structural

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02000	Piles	1.00	LS	\$151,100.00	\$151,100	
Total						\$151,100
Division 03 - Concrete						
03300	24" Structural Flat Mat On Grade	191.85	CY	\$1,275.51	\$244,706	
03300	18" Straight Wall, To 8' High	27.11	CY	\$1,714.78	\$46,488	
03300	18" Straight Wall, To 8' High	73.78	CY	\$1,714.78	\$126,516	
03300	12" Straight Wall >8' High	10.37	CY	\$2,287.26	\$23,719	
03300	12" Straight Wall >8' High	96	CY	\$2,287.26	\$219,577	
03300	12" Structural Flat Mat On Grade	16	CY	\$1,483.15	\$23,730	
Total						\$684,737
Division 05 - Metals						
05000	UV Metal Building	1.00	LS	\$438,840.00	\$438,840	
Structural Aluminum Shapes & Plates - Sub						
05140		1,267.11	LB	\$6.41	\$8,121	
05500	Aluminum Stairs, Including Railing And Supports	40.00	RSR	\$736.15	\$29,446	
05500	Checkered Aluminum Plate	520.20	SF	\$46.61	\$24,244	
05500	Aluminum Osha Handrail	218.00	LF	\$101.18	\$22,058	
05500	Aluminum Grating, 2"	608.00	SF	\$102.03	\$62,032	
05500	Aluminum Grating, 2"	367.50	SF	\$102.03	\$37,495	
Total						\$622,236
Grand Total						\$1,458,073

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Trojan
Client: City of Manteca
Location: Manteca, CA
Element: 05 Mechanical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 11 - Equipment						
11000	Trojan UV	1	LS	\$2,980,000.00	\$2,980,000	
11000	UV Installation	1	LS	\$447,000.00	\$447,000	
11000	Stainless Steel Slide Gate	3	EA	\$39,441.35	\$118,324	
11293	Slide Gate, 48" X 48"	1	EA	\$44,687.05	\$44,687	
Total						\$3,590,011
Grand Total						\$3,590,011

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Trojan
Client: City of Manteca
Location: Manteca, CA
Element: 06 Electrical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 04 - Masonry						
04000	Electrical Building	1	LS	\$637,024.00	\$637,024	
Total						\$637,024
Division 16 - Electrical						
16000	Electrical Equipment	1	LS	\$672,000.00	\$672,000	
Total						\$672,000
Grand Total						\$1,309,024

PROJECT SUMMARY

Project: Manteca UV Rehabilitation
 Client: City of Manteca - Wedeco
 Location: Manteca, CA
 Zip Code: 95337

Estimate Class: 5
 PIC: Ryan Sellman
 PM: Stephen Caswell
 Date: January 9, 2025
 By: ARL

Carollo Job # 203331

Reviewed:

NO.	DESCRIPTION	TOTAL
01	Demolition	\$3,716
02	Civil	\$247,481
03	Structural	\$1,955,822
04	Mechanical	\$4,518,061
05	Electrical	\$1,503,779
TOTAL DIRECT COST		\$8,228,859
	General Conditions	15.0% \$1,234,329
	Subtotal	\$9,463,188
	Contingency	30.0% \$2,468,658
	Subtotal	\$11,931,845
	General Contractor Overhead, Profit & Risk	18.0% \$2,147,732
	Subtotal	\$14,079,577
	Escalation to Mid-Point	11.9% \$1,672,805
	Subtotal	\$15,752,382
	Manteca Sales Tax (50% on Material only)	8.3% \$339,440
	Subtotal	\$16,091,823
	Bid Market Allowance	0.0% \$0
TOTAL ESTIMATED CONSTRUCTION COST		\$16,091,823
	Engineering, Legal & Administration Fees	0.0% \$0
	Owner's Reserve for Change Orders	0.0% \$0
TOTAL ESTIMATED PROJECT COST		\$16,091,823
The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Carollo Engineers have no control over variances in the cost of labor, materials, equipment; nor services provided by others, contractor's means and methods of executing the work or of determining prices, competitive bidding or market conditions, practices or bidding strategies. Carollo Engineers cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented as shown.		

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation
Client: City of Manteca - Wedeco
Location: Manteca, CA
Element: 02 Demolition

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02220	12" Concrete Pipe Rem From An Open Trench	60	LF	\$5.45	\$327	
02220	Demo Concrete Walls, Heavy Rebar, 12"	40.5	SF	\$26.45	\$1,071	
02220	Remove 4"-6" Asphalt Pavement	3000	SF	\$.77	\$2,318	
Total						\$3,716
Grand Total						\$3,716

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation
 Client: City of Manteca - Wedeco
 Location: Manteca, CA
 Element: 03 Civil

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02260	Solid Shoring, 16' D, Wood Planks, Stringers & X-Bracing	400	LF	\$123.50	\$49,399	
02300	Native Pipe Bed & Zone/Confined Structure Backfill, Class B Material	296.3	CY	\$37.72	\$11,176	
02300	Imported Pipe Bed & Zone/Confined Structure Backfill, Class A Material	88.89	CY	\$59.07	\$5,250	
02300	Cat 225 Trackhoe, 2Cy Bucket, Class B (Medium Digging), 0-16' D	385.19	CY	\$2.75	\$1,058	
02580	48" Precast Manhole, Xtra Depth Over 8'	10	VLF	\$328.10	\$3,281	
02580	48" X 8' Deep Precast Manhole, No Ring, Cover, Earthwork, Top Or Bottom Slab	2	EA	\$3,247.92	\$6,496	
02742	4" Ac Paving On 8" Abc	666.67	SY	\$62.09	\$41,392	
Total						\$118,052
Division 15 - Mechanical						
15249	18" Sdr-26 Pvc Sewer Pipe, In Trench	200	LF	\$170.61	\$34,121	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	80	LF	\$794.23	\$63,538	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	40	LF	\$794.23	\$31,769	
Total						\$129,429
Grand Total						\$247,481

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation
 Client: City of Manteca - Wedeco
 Location: Manteca, CA
 Element: 04 Structural

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02000	Piles	1.00	LS	\$224,800.00	\$224,800	
Total						\$224,800
Division 03 - Concrete						
03300	24" Structural Flat Mat On Grade	285.48	CY	\$1,275.51	\$364,132	
03300	18" Straight Wall, To 8' High	25.64	CY	\$1,714.78	\$43,967	
03300	18" Straight Wall, To 8' High	59.94	CY	\$1,714.78	\$102,784	
03300	12" Straight Wall >8' High	8.43	CY	\$2,287.26	\$19,282	
03300	12" Straight Wall >8' High	106.89	CY	\$2,287.26	\$244,486	
03300	12" Structural Flat Mat On Grade	21.93	CY	\$1,483.15	\$32,525	
Total						\$807,175
Division 05 - Metals						
Structural Aluminum Shapes & Plates - Sub						
05140		1,267.11	LB	\$6.41	\$8,121	
Aluminum Stairs, Including Railing And Supports						
05500		40.00	RSR	\$736.15	\$29,446	
05500	Checkerboard Aluminum Plate	908.55	SF	\$46.61	\$42,344	
05500	Aluminum Osha Handrail	270.00	LF	\$101.18	\$27,319	
05500	Aluminum Grating, 2"	608.00	SF	\$102.03	\$62,032	
05000	UV Metal Building	1.00	LS	\$717,090.00	\$717,090	
05500	Aluminum Grating, 2"	367.50	SF	\$102.03	\$37,495	
Total						\$923,847
Grand Total						\$1,955,822

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation
Client: City of Manteca - Wedeco
Location: Manteca, CA
Element: 05 Mechanical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 11 - Equipment						
11000	Wedeco UV	1	LS	\$3,787,000.00	\$3,787,000	
11000	UV Installation	1	LS	\$568,050.00	\$568,050	
11000	Stainless Steel Slide Gate	3	EA	\$39,441.35	\$118,324	
11293	Slide Gate, 48" X 48"	1	EA	\$44,687.05	\$44,687	
Total						\$4,518,061
Grand Total						\$4,518,061

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation
Client: City of Manteca - Wedeco
Location: Manteca, CA
Element: 06 Electrical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 04 - Masonry						
04000	Electrical Building	1	LS	\$771,779.08	\$771,779	
Total						\$771,779
Division 16 - Electrical						
16000	Electrical Equipment	1	LS	\$732,000.00	\$732,000	
Total						\$732,000
Grand Total						\$1,503,779

PROJECT SUMMARY

Project: Manteca UV Rehabilitation - Veolia
Client: City of Manteca
Location: Manteca, CA
Zip Code: 95337

Estimate Class: 5
PIC: Ryan Sellman
PM: Stephen Caswell
Date: January 9, 2025
By: ARL

Carollo Job # 203331

Reviewed:

NO.	DESCRIPTION	TOTAL
01	Demolition	\$3,716
02	Civil	\$247,481
03	Structural	\$1,729,732
04	Mechanical	\$2,980,511
05	Electrical	\$1,865,908
TOTAL DIRECT COST		\$6,827,348
	General Conditions	15.0% \$1,024,102
	Subtotal	\$7,851,450
	Contingency	30.0% \$2,048,204
	Subtotal	\$9,899,654
	General Contractor Overhead, Profit & Risk	18.0% \$1,781,938
	Subtotal	\$11,681,592
	Escalation to Mid-Point	11.9% \$1,387,899
	Subtotal	\$13,069,491
	Manteca Sales Tax (50% on Material only)	8.3% \$281,628
	Subtotal	\$13,351,119
	Bid Market Allowance	0.0% \$0
TOTAL ESTIMATED CONSTRUCTION COST		\$13,351,119
	Engineering, Legal & Administration Fees	0.0% \$0
	Owner's Reserve for Change Orders	0.0% \$0
TOTAL ESTIMATED PROJECT COST		\$13,351,119
The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Carollo Engineers have no control over variances in the cost of labor, materials, equipment; nor services provided by others, contractor's means and methods of executing the work or of determining prices, competitive bidding or market conditions, practices or bidding strategies. Carollo Engineers cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented as shown.		

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Veolia
Client: City of Manteca
Location: Manteca, CA
Element: 02 Demolition

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02220	12" Concrete Pipe Rem From An Open Trench	60	LF	\$5.45	\$327	
02220	Demo Concrete Walls, Heavy Rebar, 12"	40.5	SF	\$26.45	\$1,071	
02220	Remove 4"-6" Asphalt Pavement	3000	SF	\$.77	\$2,318	
Total						\$3,716
Grand Total						\$3,716

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Veolia
 Client: City of Manteca
 Location: Manteca, CA
 Element: 03 Civil

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02260	Solid Shoring, 16' D, Wood Planks, Stringers & X-Bracing	400	LF	\$123.50	\$49,399	
02300	Native Pipe Bed & Zone/Confined Structure Backfill, Class B Material	296.3	CY	\$37.72	\$11,176	
02300	Imported Pipe Bed & Zone/Confined Structure Backfill, Class A Material	88.89	CY	\$59.07	\$5,250	
02300	Cat 225 Trackhoe, 2Cy Bucket, Class B (Medium Digging), 0-16' D	385.19	CY	\$2.75	\$1,058	
02580	48" Precast Manhole, Xtra Depth Over 8'	10	VLF	\$328.10	\$3,281	
02580	48" X 8' Deep Precast Manhole, No Ring, Cover, Earthwork, Top Or Bottom Slab	2	EA	\$3,247.92	\$6,496	
02742	4" Ac Paving On 8" Abc	666.67	SY	\$62.09	\$41,392	
Total						\$118,052
Division 15 - Mechanical						
15249	18" Sdr-26 Pvc Sewer Pipe, In Trench	200	LF	\$170.61	\$34,121	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	80	LF	\$794.23	\$63,538	
15252	48" C200 1/4" Wall Wld Cs Pipe In Open Trench	40	LF	\$794.23	\$31,769	
Total						\$129,429
Grand Total						\$247,481

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Veolia
 Client: City of Manteca
 Location: Manteca, CA
 Element: 04 Structural

Format: MASTER FORMAT 17
 Date : January 9, 2025
 By : ARL
 Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 02 - Site Construction						
02000	Piles	1.00	LS	\$169,400.00	\$169,400	
Total						\$169,400
Division 03 - Concrete						
03300	24" Structural Flat Mat On Grade	215.11	CY	\$1,275.51	\$274,374	
03300	18" Straight Wall, To 8' High	25.33	CY	\$1,714.78	\$43,435	
03300	18" Straight Wall, To 8' High	68.44	CY	\$1,714.78	\$117,360	
03300	12" Straight Wall >8' High	8.3	CY	\$2,287.26	\$18,984	
03300	12" Straight Wall >8' High	120.89	CY	\$2,287.26	\$276,507	
03300	12" Structural Flat Mat On Grade	20.15	CY	\$1,483.15	\$29,885	
Total						\$760,546
Division 05 - Metals						
05000	UV Metal Building	1.00	LS	\$524,700.00	\$524,700	
Structural Aluminum Shapes & Plates - Sub						
05140		1,267.11	LB	\$6.41	\$8,121	
05500	Aluminum Stairs, Including Railing And Supports	40.00	RSR	\$736.15	\$29,446	
05500	Checkered Aluminum Plate	570.00	SF	\$46.61	\$26,565	
05500	Aluminum Osha Handrail	242.00	LF	\$101.18	\$24,486	
05500	Aluminum Grating, 2"	480.00	SF	\$102.03	\$48,973	
05500	Aluminum Grating, 2"	367.50	SF	\$102.03	\$37,495	
Total						\$699,786
Division 14 - Conveying Systems						
14000	Bridge Crane	1.00	LS	\$100,000.00	\$100,000	
Total						\$100,000
Grand Total						\$1,729,732

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Veolia
Client: City of Manteca
Location: Manteca, CA
Element: 05 Mechanical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 11 - Equipment						
11000	Veolia UV	1	LS	\$2,450,000.00	\$2,450,000	
11000	UV Installation	1	LS	\$367,500.00	\$367,500	
11000	Stainless Steel Slide Gate	3	EA	\$39,441.35	\$118,324	
11293	Slide Gate, 48" X 48"	1	EA	\$44,687.05	\$44,687	
Total						\$2,980,511
Grand Total						\$2,980,511

DETAILED COST ESTIMATE

Project: Manteca UV Rehabilitation - Veolia
Client: City of Manteca
Location: Manteca, CA
Element: 06 Electrical

Format: MASTER FORMAT 17
Date : January 9, 2025
By : ARL
Reviewed:

SPEC. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
Division 04 - Masonry						
04000	Electrical Building	1	LS	\$875,908.00	\$875,908	
Total						\$875,908
Division 16 - Electrical						
16000	Electrical Equipment	1	LS	\$990,000.00	\$990,000	
Total						\$990,000
Grand Total						\$1,865,908

APPENDIX E

SIDESTREAM TREATMENT SITE VISIT NOTES



CITY OF MANTECA

Site Visit to DC Water December 2024

Prepared By: Komal Rathore / John Witter

Location: DC Water

Subject: Meeting Notes

Attendees: **Manteca:** Dustin Valiquette, Cody Robinson, Tim Carroll

Carollo: Ryan Sellman, John Witter, Komal Rathore, Andrew Freitas, Xiao Guo

This memorandum summarizes the discussion and lessons learned about the DEMON® sidestream treatment process during the site visit to Blue Plains AWWTP in Washington, DC.

Agency: DC Water

Facility: Blue Plains Advanced Wastewater Treatment Plant

Address: 5000 Overlook Ave SW, Washington DC, 20032

Contacts:

Miguel Miranda, PE, Senior Process Engineer

Miguel.miranda@dcwater.com

(202) 787-4718 (office)

(401) 261-2013 (cell)

Shawna Martinelli, PE

Director of Operations and Process Engineering

smartinelli@dcwater.com

(202) 787-4180 (office)

(508) 942-0448 (cell)

MAINSTREAM TREATMENT

- Average design flow of 384 mgd wet weather flow of 555 mgd, and current average flows around 290 mgd.
- Produces Class A biosolids
- Secondary treatment consists of an A/B process, which is two stage activated sludge processes (bioreactors and clarifiers) in series. First stage for BOD removal, short SRT ~2 days. Second stage for nitrification/denitrification, longer SRT.

SIDESTREAM TREATMENT – DEMON®

- Filtrate Treatment Facility, DEMON based that achieves deammonification of dewatering filtrate was commissioned in 2017.
- Demon process receives flow from belt filter presses ~0.8 to 1 mgd and is designed to treat ~27,000 lbs/day of NH₃. Phosphoric acid and dilution water is added before sending flow to the DEMON® process. Total flow is ~1-1.4 mgd with dilution. Only need 3 DEMON® reactors in service.

- Six basins with 1 MG volume each. 5/6 basins operate in SBR, 1/6 operates in continuous flow (started in 2023). They will be converting the other 5 basins to continuous flow with microscreens in the near future.
- Biosolids treatment includes facilities consisting of CAMBI thermal hydrolysis process (THP) followed by digestion and combined heat and power (CHP). CAMBI centrate is inhibitory. Some inhibition to filtrate from THP digestion can occur. Therefore, dilution water is added.
- NH_3 concentrations before dilution are typically 1,800 – 2,000 mg/L and reduce to 1,600 mg/L or less after dilution. They were as low as 1,000 mg/L but they have been reducing the dilution water.
- DEMON® process provides ~85% NH_3 removal and achieves 100 – 150 mg/L NH_3 in sidestream treated effluent without any alkalinity addition. Centrate alkalinity of about 4,500 mg/L and sidestream treated effluent alkalinity of about 300 mg/L.
- They were not a fan of the SBR process.
- Continuous mode is able to treat higher TSS compared to SBR mode.
- Operating in continuous mode removes the need for decanter but requires baffle walls and built in clarifier.
- DO range of 0.3 – 0.5 mg/L, pH typically around 7, Hydrocyclone – 1 hr/cycle
- Operations Feedback: Requires a process champion with full understanding of the process

Mechanical

- 2 blowers / basin – neuros blowers with 3 operating modes (DO, airflow, constant speed)
- 4 mixers / basin – invent mixers with VFDs
- 1 hydrocyclone / basin for SBR mode
- 1 microscreen / basin for continuous mode
- Microscreen is gentler on biomass and can't shear. 150 um pore.

Instrumentation

- Instrumentation includes pH, temperature, DO, and conductivity probes
- pH based control strategy with high and low setpoints.
- Initially had HACH probes but were difficult to remove and calibration needed to be performed outside. It was very difficult to calibrate probes in the field in cold temperatures. Tested between Endress+Hauser and Knick probes. Knick can be taken inside for cleaning / calibrating. Ended up changing the probes to Knicks.
- Installed Cerlic TSS analyzers.
- They don't have any nitrogen probes in the basin, they take samples for lab analysis and use nitrite test strips, and grab samples for spectrophotometer to understand nitrogen trends.
- Sampling: 2-3 times / week analysis of influent and effluent – NH_3 , NO_3 , NO_2 , and TSS

Chemicals

- Overdosing polymer caused foaming issues and anammox popping / coating issues. To avoid foaming, half a cup of antifoam agent is sprayed. Hydrocyclones help with retaining anammox and waste AOBs / NOBs. Also use hydrocyclones to shear excess polymer.
- DEMON® process requires addition of micronutrients, such as phosphoric acid.

Process Issues

- Sinking and floating solids observed. Could be due to too many solids in the centrate. The CAMBI process likely produces a higher concentration of inert solids due to additional cell lysis (TSS 1600 – 2400 mg/L). No anammox bacteria in the floating sludge. Bioreactors are not designed to remove or flush this floating sludge.
- Floating solids have caused issues with level sensors and other probes. Once a month staff need to clean and calibrate the probes
- Too much hydrocyclone operation results in overshearing the anammox which causes issues with biomass settling and therefore accidental loss of biomass.
- Initially added lamella pretreatment to treat and remove excessive solids, lamella don't work anymore. Current project to convert primary clarifiers to provide equalization and remove solids.



CITY OF MANTECA

Site Visit to Howard County, MD December 2024

Prepared By: Komal Rathore / John Witter

Location: Little Patuxent WRP

Subject: Meeting Notes

Attendees: **Manteca:** Dustin Valiquette, Cody Robinson, Tim Carroll

Carollo: Ryan Sellman, John Witter, Komal Rathore, Chrissie Swann

This memorandum summarizes the discussion and lessons learned about the ANITA™ MOX sidestream treatment process during the site visit to Little Patuxent WRF in Howard County, MD.

Agency: Howard County, MD

Facility: Little Patuxent Water Reclamation Plant

Address: 8869 Greenwood Pl, Savage, MD, 20763

Contact:

Justin Myers, Plant Superintendent

jfmyers@howardcountymd.gov

(410) 313-1211 (office)

MAINSTREAM TREATMENT

- 29 mgd enhanced nutrient removal (ENR) plant, average influent flows of around 20 mgd.
- Need to meet TN of 3 mg/L and TP of 0.3 mg/L.

SIDESTREAM TREATMENT – ANITA™ MOX

- Overall, very happy with the process. Not much oversight needed, can mostly set it and forget it.
- Have a magprex P removal process upstream of ANITA™ Mox.
- Design flow of 0.176 mgd with NH₃ concentration of 1,100 mg/L.
- Retrofitted into existing tanks with shallow side water depth.
- Basins are covered but the reactors get too hot in the summer. Dilution water is added for heat control.
- Reactors occasionally operate in intermittent aeration mode automatically based on pH or DO setpoint.
- Achieves about 80% removal.
- Process started in 2019 and hasn't been offline since. They have not had to take a basin offline to do any maintenance or remove media.
- Submerged hot water loop in reactor with 3-way valve that operates to maintain a temperature setpoint. No heat exchanger dedicated to sidestream treatment process.

Mechanical

- Kaiser compressor / blowers
- PHI bubble mixing in the EQ basin works well, no issues with it. Haven't taken an EQ basin offline.
- Air lift foam suppression pumps are ok but aren't very effective. Some foam/media/solids buildup often clogs the discharge orifice of the pump and needs to be wiped clean.
- LobePro Rotary lobe influent pumps (2+1) work well but need to be taken offline to clear struvite. Gate valves on pump discharge manifold get quite a bit of struvite buildup.

Instrumentation

- Calibrate HACH probes monthly
- Sample influent and effluent nitrogen species and alkalinity for lab analysis daily
- Instrumentation includes DO / pH probes, don't have nitrogen probes.

Chemical

- Alkalinity addition (caustic) dosed with Watson Marlow peristaltic pumps.
- No anti foam or micronutrient chemical addition. No foaming issues unless polymer is overdosed



CITY OF MANTECA

Site Visit to Pierce County, WA December 2024

Prepared By: John Witter

Location: Chambers Creek WWTP

Subject: Meeting Notes

Attendees: **Manteca:** Dustin Valiquette, Cody Robinson, Tim Carroll

Carollo: Stephen Caswell, Ryan Sellman, John Witter, Alison Payauys, Meghna Prasad

This memorandum summarizes the discussion and lessons learned about the DEMON® sidestream treatment process during the site visit to Chambers Creek WWTP in Pierce County, WA.

Agency: Pierce County, WA

Facility: Chambers Creek WWTP

Address: 10311 Chambers Creek Rd W, University Place, Washington, 98467

Contacts:

Jeremy Carnahan, Wastewater Manager

Jeremy.carnahan@piercecounitywa.gov

(253) 798-2567 (office)

(253) 328-1093 (cell)

MAINSTREAM TREATMENT

Mainstream process is a 5 stage Bardenpho. No effluent P limit but they achieve P removal to improve the marketability of the biosolids product. They sell dried product (5-5-0) (centrifuge to thermal dryer) in winter and produce dewatered cake (centrifuge) in the winter.

SIDESTREAM TREATMENT – DEMON®

DEMON® 1.0 SBR process.

There are two parallel treatment trains and they can't evenly split flow between them.

Achieve about 80% TIN removal and close to 90% NH₃ removal when operating well.

Centrate is 200 mg/L TSS, which goes to a sludge holding tank upstream of EQ that has a rake and chain primary clarifier mechanism for solids separation.

Centrate NH₃ is 3000 mg/L. Mesophilic digestion ran at 62 d SRT. Digester feed is 10% TS from RDT. Pump a portion of DS to mix with digester feed to improve pumpability.

Old aeration basins were converted to EQ and DEMON® reactors.

Centrate flow is around 250 kgpd in the summer when they run the dryer and around 40-60 kgpd in the winter.

There is no centrate heating but they have a storage digester upstream of dewatering that they can heat to 110 F. Still, reactor temperature can get down to low 20's C during the winter, causing "nitrite lock" where they build up nitrite and DMX bacteria can't convert to nitrogen gas. Nitrite concentrations could be as high as 150 mg/L. Foam buildup (several feet) is indicative that the process is going into nitrite lock.

PROCESS / I&C

Operate at a DO around 0.5 – 0.7 mg/L and a pH between 6.5 and 7.2.

YSI nitrogen probes in the secondary process, which they don't like because the concentrations are lower than the reporting threshold.

DEMON® has proprietary controls of the system that the owner is not allowed to change the programming of.

Overdosing polymer causes the granules to get coated in polymer and performance decreases. They switched from DAFT to RDT and kept the same polymer, which caused them to overdose polymer. Once they went to a different polymer optimized for RDT, they didn't have any more polymer overdose or polymer related process issues.

Decant cycle every 8 hrs.

The instruments are located in different locations in each reactor so the trends between the two reactors aren't consistent. Use nitrite test strips to monitor process and spectrophotometry for nitrogen trending.

Have Hach DO, conductivity, and pH probes in each basin. They want pH and conductivity to trend in the same direction. Increasing feed flow increases pH. Increasing air flow reduces pH.

MECHANICAL

Decanter came loose during startup and wasted a lot of biomass and had to reseed the process. Added more structural support to the decant mechanism and haven't had issues since.

Messner panel aeration haven't had any issues with performance or maintenance except one time when a nut on the all thread rod came loose and floated the panel. Had to pump granules from one basin to the other to drain it and secure the panel.

Two hydrocyclones of different sizes per reactor, smaller one to shear granules to control polymer buildup and recirculate back to reactor and bigger one to waste flocs and NOBs. Flygt submersibles feed hydrocyclones, no issues with them.

Aerzen positive displacement blowers, no issues with them.

Wilo submersible mixers, 2 per reactor and EQ. Struvite will build up on the blades of the mixer.

Vogelsang rotary lobe feed pump. Load and liner swelled up early on due to material incompatibility but haven't had issues since they replaced it.

CHEMICAL

No alkalinity addition.

Dose micronutrients and EDTA that they purchase from WWW. They tried to just dose generic iron salts (cheaper) instead of micronutrients but after a couple weeks/months the performance dropped off and they switched back to proprietary micronutrients. Each tote costs about \$10k and will last 3-4 months. They pour a couple liters per day in a carboy and manually dump it into the reactor, no chem feed system.



CITY OF MANTECA

Site Visit to Central Valley WRF December 2024

Prepared By: John Witter
Location: Central Valley WRF
Subject: Meeting Notes
Attendees: **Manteca:** Dustin Valiquette, Cody Robinson, Tim Carroll
Carollo: Stephen Caswell, Ryan Sellman, John Witter, Randy Zollinger, Jade Echard

This memorandum summarizes the discussion and lessons learned about the ANITA™ Mox sidestream treatment process during the site visit to Central Valley WRF in Salt Lake City, UT.

Agency: Central Valley WRF

Facility: Central Valley WRF

Address: 800 Central Valley Rd, South Salt Lake, UT, 84119

Contacts:

Phil Heck, General Manager

heckp@cvwrfut.gov

(801) 9173-9100

Dustin Gloor, Process Coordinator

gloord@cvwrfut.gov

(801) 973-9100 ext: 134 (office)

(336) 410-1611 (cell)

MAINSTREAM TREATMENT

Currently have trickling filters and a solids contact basin but new P regs, converting to West Bank process (PS fermentation and centrifuge feeds anaerobic zone, PE to anoxic zone with IMLR, similar to Kelona BC).

They have MagPrex (dosing MgCl) upstream of ANITA™ Mox but they still have struvite buildup issues

2 stage mesophilic digestion. Main digesters are two large egg shaped.

SIDESTREAM TREATMENT – ANITA™ Mox

ANITA™ Mox startup in August 2023 with 5% seed media from Durham, NC.

Currently have BFPs with washwater dilution (NH₃ 500-600). In the future they will run BFPs and centrifuges. Future BFPs will have washwater separated from filtrate. Cake is 16-19% TS. Polymer dose is 12-15 lb/DT, which they track closely.

ANITA™ Mox was a \$21M project bid in 2021 as part of a larger \$500M plant upgrade.

Showed that by adding ANITA™ Mox they could reduce secondary process sizing by about 20% and save millions of dollars.

During analysis, they visited DEMON®, ANITA™ Mox, and AnammoPAQ facilities in Europe. Thought that ANITA™ Mox had the lowest operational complexity. Had an evaluated bid process with various evaluation criteria. Only AnammoPAQ and ANITA™ Mox submitted bids and they went with ANITA™ Mox.

Converted an old digester from the 1950s to a pre-treatment, heated, insulated EQ tank. Cone bottom that they let solids settle out and pump out. TSS is 500-100 going into the EQ and 40-50 going to the reactor.

They achieve around 80% NH₃ removal, effluent NH₃ around 150 mg/L and NO₃ <50.

Reactors are circular because they were cheaper to construct and offers better seismic resistance. Reactors and EQ are both insulated.

They have a screened mud valve if they need to drain a tank and a standpipe for overflow.

They can pump media from one reactor to another if they needed to.

They have a mesh screen at the water surface level so they can spray foam through it but they don't run it too often and doesn't seem to be too effective.

The facility was designed for buildout of a third reactor.

PROCESS / I&C

Operates at a DO around 1.5 and a pH around 7.0

They discharge treated sidestream to the head of the secondary process, which has shown to improve the secondary process performance.

Suggest having an SME that operates the facility.

Try to maintain constant feed flow rate around 190 gpm.

They have Hach nitrogen probes and are currently converting to YSI probes in their mainstream. The probes are just used for trending and they run based on DO and temperature.

Currently running based on air flow setpoint. Looking into being able to run based on pH. The effluent NH₃ and pH trend together.

MECHANICAL

They have Niron pipe to prevent struvite buildup. Similar to HDPE with fiberglass additive with fused fittings.

Tube in tube heat exchanger maintains temperature for the reactor. They haven't seen scaling of the centrate in the HEX.

Gorman Rupp centrifugal feed pumps, don't have any issues with and don't see struvite buildup.

Atlas Copco PD blowers, no issues with them

Submersible pump in the effluent channel pumps to foam suppression nozzles within the reactor. Pump runs on a timer.

Invent vertical impeller mixer, one per reactor, first installation of its kind. Used only during startup, haven't had issues with it. Process has run in continuous aeration since.

CHEMICAL

ATTACHMENT 3

Have two different types of anti foam chemical that they dose manually (100 mL at a time) with Blue-White pumps. They have not gone through one drum of anti foam chem (since startup in Aug 23). Anti foam chem will inhibit the oxygen transfer and reduce DO.

They have pretty hard source water, so no additional alkalinity or micronutrient feed. Thinks need for micronutrient would be based on source water quality, not which treatment technology you have.

EXHIBIT “X”

City of Manteca Conflict of Interest Policy

§ 2.36.020. Conflict of interest code for design-build City projects.

A) This establishes the organizational conflict of interest guidelines applicable to City projects procured pursuant to Public Contract Code Section 22185, et seq.

B) This applies to all vendors that have entered into or wish to enter into contracts with the City.

C) Vendors participating as proposers ("Proposers") on a project or joining a team shall not have an organizational conflict of interest. Organizational conflicts of interest are created by circumstances arising out of Proposers' existing or past activities, business or financial interests, familial relationships, contractual relationships, or organizational structure (e.g., parent entities, subsidiaries, affiliates) that could result in any of the following:

- (i) impairment or potential impairment of proposers' ability to render impartial assistance or advice to the City or of their objectivity in performing work for the City.
- (ii) an unfair competitive advantage for any Proposer with respect to the City's procurement process, or
- (iii) a perception or appearance of impropriety with respect to any of the City's procurements or contracts or perception or appearance of unfair competitive advantage with respect to a procurement by District (irrespective of whether such perception is accurate).

D) Proposers having any actual, apparent, direct or indirect, or potential conflict of interest that may exist with respect to the Proposer, any employees of the Proposer, any team member(s), or any other person relative to the services to be provided, must immediately make a full written disclosure of the conflict to the City. If a Proposer determines that a potential conflict of interest exists, the Proposer's disclosure will not necessarily disqualify the Proposer from being awarded a contract. The Proposer shall submit proposed measures to avoid, neutralize, or mitigate all potential or actual conflicts. The City, at its sole discretion, shall determine whether an organizational conflict of interest exists and whether the proposed measures are sufficient to overcome the conflict or potential conflict and whether the Proposer may continue with the procurement process.

E) The successful Proposer has an ongoing obligation to monitor and disclose conflicts or potential conflicts of interest. The City has the right to ongoing enforcement of this.

If an organizational conflict of interest is:

- (i) Discovered after the contract has been awarded, the Proposer must make an immediate and full written disclosure to the City in writing and detail the action(s) that the Proposer has taken or proposes to take to avoid or mitigate the conflict. The City may, at its sole discretion, terminate the contract.

- (ii) Determined to exist and the Proposer was aware of the organizational conflict of interest prior to award and did not disclose the conflict, or if a Proposer provides false or misleading information in response to an inquiry from the City, the City may, at its sole discretion, terminate the contract.
- (iii) Arises after the award and the Proposers' proposed measures to avoid or mitigate the conflict are determined by the City to be inadequate, the City may, at its sole discretion, terminate the contract.

If the contract is terminated, the City assumes no obligation, responsibility or liability to reimburse all or part of the costs incurred or alleged to have been incurred by the Proposer, and the City shall be entitled to pursue any and all appropriate legal remedies.

F) This shall be incorporated by reference into all procurement packages as well as any contract for the engineering/design services, inspection, or technical support in the administration of projects executed by the City.

G) This does not derogate from any obligation of "Consultant" under the Fair Political Practices Act, Regulations and the District's Conflict of Interest Code. For reference, "Consultants" are defined in FPPC Reg. 18700.3 and includes persons who make a government decision whether to authorize the agency to enter into, modify or renew a contract, grant agency approval to a contract or specification for such a contract, or grant agency approval to a plan, report or design.

EXHIBIT “Y”

DB Firm Conflict of Interest Statement

March 17, 2026

Attn: Mr. Kyzen Nicolas

Associate Engineer

City of Manteca – Engineering Department

1001 West Center Street, Suite E

Manteca, CA 95337

Re: RFP – Progressive Design-Build Services for Sidestream Treatment and UV Rehabilitation Project (CIP 25004 & 25005)

Dear Mr. Nicolas,

Overaa has completed numerous projects for the City of Manteca under a variety of delivery methods. As the selected proposer for the Sidestream Treatment and UV Rehabilitation Project, we recognize our responsibility to identify, disclose, and monitor any actual or potential conflicts of interest in accordance with the City's policy. At this time, Overaa is under contract with the City on two projects procured through the traditional design-bid-build process, Capacity Improvements Project, anticipated completion July 2026, and Sludge Thickening & Dewatering Unit No. 3, anticipated completion July 2027. These projects were competitively bid and are unrelated to the procurement and evaluation process for the Sidestream project.

In California, conflicts of interest in public contracting are governed by Government Code § 1090, which prohibits public officials, or private parties acting in a public or quasi-public role, from having a financial interest in contracts they help “make.” Courts interpret “making” broadly to include planning, advising, drafting specifications, or influencing the procurement process (*People v. Superior Court*, 3 Cal.5th 230, 237 (2017)). Municipal guidance confirms that § 1090 applies to participation in the contracting process itself, not merely to prior projects with the same agency (League of California Cities, *Navigating Conflict Issues in Engaging Consultants & Government Code § 1090 Overview*, City Attorneys' Annual Conference paper, 2018).

Applied here, Overaa's prior projects with the City do not, by themselves, create a conflict. The key question is whether the design-builder participated in “making” the current

contract in a public or quasi-public capacity. Overaa was selected through a competitive design-build process and did not help draft the solicitation, set evaluation criteria, or influence the agency's decision. Under the case law and municipal guidance, this makes Overaa a repeat vendor rather than a conflicted participant, so § 1090 does not apply.

Throughout the RFP process, Overaa and PACE took reasonable steps to avoid any impropriety or the appearance of an unfair competitive advantage. Our team conducted a single pre-proposal site visit, documented through the City's sign-in procedures, and all time on site was spent in the presence of City Engineering and Operations staff. This confirms that the design-builder did not participate in making the contract and had no opportunity to influence the procurement process, reinforcing that § 1090 is not implicated.

Based on the above, Overaa is not aware of any actual or potential conflict of interest associated with this project. Should any circumstance arise that could present a conflict, Overaa will promptly disclose it to the City in accordance with the City of Manteca's Conflict of Interest Policy.

Sincerely,

Ryan James
Sr. Project Manager, Water Group
Overaa Construction