File ID: 2026-00902 6/9/2026

[Contract] E.A. Fairbairn Water Treatment Plant Grit Separator Rake Arm Replacement

File ID: 2026-00902

Location: District 6

Recommendation: Adopt a **Resolution** authorizing the City Manager or designee to: 1) approve the contract plans and specifications for the E.A Fairbairn Water Treatment Plant (WTP) Grit Separator Rake Arm Replacement project; 2) execute a construction contract with TNT Industrial Contractors, Inc. for an amount not-to-exceed $389,850; and 3) execute change orders up to $150,000.

Contact: Carlos Barragan, Project Manager, (916) 808-4030, cbarragan@cityofsacramento.org; Sherill Huun, Engineering & Water Resources Division Manager, (916) 808-1455, shuun@cityofsacramento.org; Dalia Fadl, Director, (916) 808-3765, dfadl@cityofsacramento.org; Department of Utilities

Presenter: None

Attachments:
1-Description/Analysis
2-Contract
3-Resolution

Description/Analysis
Issue Detail: Staff recommend City Council award a construction contract to TNT Industrial Contractors, Inc., to rehabilitate the E.A. Fairbairn Water Treatment Plant (FWTP) grit basin. The project scope includes: removal and replacement of the clarifier rake arm, recoating of center pier, replacement of access ladder, and installation of safety access gate to ladder.

Given that the FWTP grit separator is only accessible during short annual shutdowns and is essential for water production, staff recommends council approve increased authority for construction change orders up to $150,000 to address any unforeseen conditions that may arise during rehabilitation. This increase will help ensure that any critical repairs can be completed within the limited shutdown window, preventing delays in bringing the water treatment plant back to service.

Policy Considerations: City Council approval is required for contracts of $250,000 or more per City

Code 3.56.090. The action requested conforms with City Code Chapter3.56, Articles I and III, which provide for award of competitively bid contacts to the lowest responsible bidder. This project is also consistent with the 2040 General Plan Policy PFS-4.3 to rehabilitate, replace, and expand critical infrastructure to ensure reliability and safety.

Economic Impacts: This project is expected to create 1.56 total jobs (0.9 direct jobs and 0.66 jobs through indirect and induced activities) and create $240,706 in total economic output ($151,719 of direct output and another $88,987 of output through indirect and induced activities).

The indicated economic impacts are estimates calculated using a calculation tool developed by the Center for Strategic Economic Research (CSER). CSER utilized the IMPLAN input-output model (2009 coefficients) to quantify the economic impacts of a hypothetical $1 million of spending in various construction categories within the City of Sacramento in an average one-year period. Actual impacts could differ significantly from the estimates and neither the City of Sacramento nor CSER shall be held responsible for consequences resulting from such differences.

Environmental Considerations: The proposed activity has been determined to be exempt from the California Environmental Quality Act (CEQA) pursuant to Section 15301 and 15302 of the CEQA Guidelines governing existing facilities and replacement or reconstruction. The activity consists of the operation, repair, and maintenance of existing facilities including the restoration or rehabilitation of deteriorated or damaged structures, facilities, or mechanical equipment to meet current standards of public health and safety; and the replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity.

Sustainability: The proposed project is consistent with the 2040 General Plan Goal PFS-3.5 Water Treatment Capacity and Infrastructure as it improves infrastructure reliability, which will ensure continued safe operation and maintenance of the existing facility.

Commission/Committee Action: Not applicable.

Rationale for Recommendation: On January 21, 2026, a competitive bid (B2614132002) was advertised and issued on PlanetBids. On the due date of February 18, 2026, two (2) bids were received. After reviewing the bids, TNT Industrial Contractors, Inc. was selected as the lowest responsible bidder.

The bid results are as follows:

Contractor	Amount	Ranking
TNT Industrial Contractors, Inc.	$389,850	1
NMI Industrial	$690,001	2

The Engineer’s construction cost estimate was $840,000.

Financial Considerations: There is sufficient funding in the Fairbairn Water Treatment Plant (FWTP) Rehab Project (Z14130200, Fund 6005) to award a contract to TNT Industrial Contractors, Inc., for an amount not to exceed $389,850 as well as the additional $150,000 in possible change orders.

There are no General Funds allocated or planned for this project.

Local Business Enterprise (LBE): TNT Industrial Contractors, Inc., is an LBE.

Background: The clarifier rake arm assembly for the grit basin at FWTP is the original equipment that was installed in the 1960s. In 2020, water treatment plant staff replaced failing bolts on the equipment to keep the equipment in operation. An in-depth structural analysis was performed by a structural consultant in 2022 to assess the structural integrity of the rake arms. It was determined that the coating on the equipment had failed and substantial material loss in structural members had occurred due to corrosion. The installation of new stainless steel rake arms will provide an expected service life of approximately 30-50 years with proper maintenance, significantly improving long-term reliability.

All water from the American River intake moves through the FWTP grit basin prior to being treated to drinking water standards. It is a single basin designed to collect and remove heavy solids and sediment before the solids can move into the next step in the treatment process. Ensuring that this facility stays in operation improves the effectiveness of the treatment process due to the higher amount of heavy solids that won’t have to be treated further down in the system.

AGREEMENT
(Construction Contract Over $25,000)

THIS AGREEMENT, dated for identification _____, 20__, is made and entered into between the CITY OF SACRAMENTO, a municipal corporation ("City"), and TNT Industrial Contractors, Inc.("Contractor").

The City and Contractor hereby mutually agree as follows:

1. CONTRACT DOCUMENTS

The Contract Documents, sometimes also referred to as the "Contract," consist of the following items, which are hereby incorporated by reference as if set forth in full in this Agreement:

Notice to Contractors
Proposal Form submitted by the Contractor
Instructions to Bidders
Subcontractor and Local Business Enterprise Participation Form
Drug-Free Workplace Policy and Affidavit
Construction and Demolition (C&D) Debris Recycling Requirements
Workers' Compensation Insurance Certification
Federal or State funding requirements (if applicable)
Local Business Enterprise (LBE) Requirements
Requirements of the Non-Discrimination in Employee Benefits Code
Ban-The-Box Requirements
CWTA Requirements (if applicable)
Addenda, if any
This Agreement
Standard Specifications
Special Provisions
Plans and Technical Specifications
The drawings and other data and all developments thereof prepared by City pursuant to the Contract
Project Progress Payment Application
Any modifications of any of the foregoing made or approved by City, including but not limited to duly authorized change orders

Unless specifically noted otherwise, references to the "Standard Specifications" shall mean and refer to the Standard Specifications for Public Construction of the City of Sacramento approved by the Sacramento City Council on November 10, 2020 (Resolution No. 2020-0354), and any subsequent amendments thereto approved by the Sacramento City Council or the Sacramento City Manager. Work called for in any one Contract Document and not mentioned in another is to be performed and executed as if mentioned in all Contract Documents. The

table of contents, titles and headings contained in the Contract Documents are provided solely to facilitate reference to various provisions of the Contract Documents and in no way affect or limit the interpretation of the provisions to which they refer.

2. DEFINITIONS

Unless otherwise specifically provided herein, all words and phrases defined in the Standard Specifications shall have the same meaning and intent in this Agreement.

3. AGREEMENT CONTROLS

In the event of a conflict between any of the terms and conditions set forth in this Agreement and the terms and conditions set forth in other Contract Documents, the terms and conditions set forth in this Agreement shall prevail, except that the provisions of any duly authorized change order shall prevail over any conflicting provisions of this Agreement.

4. SCOPE OF CONTRACT

Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, material and transportation necessary to perform and complete in a good and workmanlike manner to the satisfaction of City, all the Work called for in the Contract Documents entitled:

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement (PN:Z14130234)

Including the Work called for in the following alternative bid items described in the Proposal Form:

_____

Contractor agrees to perform such Work in the manner designated in and in strict conformity with the Contract Documents.

5. CONTRACT AMOUNT AND PAYMENTS

City agrees to pay and Contractor agrees to accept, as complete payment for the above Work, in accordance with the schedule and procedures set forth in the Contract Documents and subject to deductions, withholdings and additions as specified in the Contract Documents, a total sum that shall not exceed $389,850.00 , as set forth in Contractor's Proposal Form. In addition, subject to deductions, withholdings and additions as specified in the Contract Documents, payment for individual items of the Work shall be computed as follows:

A. For items of the Work for which a lump sum price is specified in Contractor's Proposal Form, Contractor shall be paid the lump sum price(s) specified in Contractor's Proposal Form; and

B. For items of the Work for which a unit price is specified in Contractor's Proposal Form, Contractor shall be paid the sum computed at such unit price, or computed at a different price if such different price is determined by City in accordance with the

Standard Specifications, based on the actual amount of each such item performed and/or furnished and incorporated in the Work; provided that in no event shall the total sum for a unit price item exceed the total bid amount set forth for such item in the Contractor's Proposal Form, unless authorized by Change Order.

6. PROGRESS PAYMENTS

Subject to the terms and conditions of the Contract, City shall cause payments to be made upon demand of Contractor as follows:

A. On or about the first of the month, the Engineer, as defined in section 1-25 of the Standard Specifications ("Engineer"), shall present to the Contractor a statement, which may be in the form of a Project Progress Payment Application, showing the amount of labor and materials incorporated in the Work through the twentieth (20) calendar day of the preceding month. After both Contractor and Engineer approve and execute the statement in writing, and the City's labor compliance officer provides written approval, the City shall issue a certificate for payment of ninety-five (95) percent of the amount in the statement it shall find to be due, subject to any deductions or withholdings authorized or required under the Contract or any applicable Laws or Regulations.

B. Contractor's written approval and execution of the statement shall contain a signed certification under penalty of perjury under the Laws of the State of California that all items, units, prices, and quantities listed in the monthly estimate are correct, and that all Work has been performed, and materials supplied in full accordance with the conditions of applicable laws, rules, and regulations, and the Contract Documents.

C. No inaccuracy or error in said monthly statements or estimates shall operate to release Contractor from damages arising from such Work or from enforcement of each and every provision of the Contract Documents, and City shall have the right subsequently to correct any error made in any statement, certificate, or estimate for payment.

D. Contractor shall not be paid for any defective or improper Work.

E. The remaining five (5) percent of the value of the Work performed under the Contract, if unencumbered and subject to any deductions or withholdings authorized or required under the Contract or any applicable Laws or Regulations, shall be released not later than sixty (60) days after completion and final acceptance of the Work by City. Acceptance by Contractor of the final payment shall constitute a waiver of all claims against the City arising under the Contract Documents, except for disputed claims in stated amounts that the Contractor specifically reserves in writing, but only to the extent that the Contractor has complied with all procedures and requirements applicable to the presentation and processing of such claim(s) under the Contract Documents. Contractor shall be entitled to substitute securities for retention or to direct that payments of retention be made into escrow, as provided in Public Contract Code Section

22300, upon execution of the City's Escrow Agreement for Security Deposits in Lieu of Retention.

F. The parties agree that, for purposes of the timely progress payment requirements specified in Public Contract Code Section 20104.50, the date that the City receives a statement jointly approved by the Contractor and the Engineer as provided above shall be deemed to constitute the date that City receives an undisputed and properly submitted payment request from the Contractor. Progress payments not made within 30 days after this date may be subject to payment of interest as provided in Public Contract Code Section 20104.50.

G. This Contract is subject to compliance monitoring and enforcement by the California Department of Industrial Relations, as specified in California Labor Code section 1771.4.

7. PUBLIC WORKS REQUIREMENTS

A. Payment of Prevailing Wages: Contractor and any subcontractor(s) performing any Public Work shall comply with the provisions of Sacramento City Code section 3.60.180 and applicable provisions of the California Labor Code, which require, among other things, that Contractor and all subcontractors pay not less than the prevailing rate of wages, as determined by the Director of the California Department of Industrial Relations ("DIR") in accordance with California Labor Code section 1773. Contractor and every subcontractor shall maintain payroll records and submit certified payrolls and other labor compliance documentation electronically when and as required by CITY. In addition, Labor Code Section 1771.4 requires the Contractor and any subcontractor performing any Public Work to furnish electronic payroll records directly to the Labor Commissioner. Contractor shall include these requirements in every subcontract.

This Agreement is subject to compliance monitoring and enforcement by the DIR, as specified in California Labor Code section 1771.4. The Contractor and any subcontractor will be subject to withholding and penalties for violation of prevailing wage requirements in accordance with applicable law, including Labor Code Sections 1726, 1741, 1771.5, and 1775, and City Code Section 3.60.180. Questions regarding the City's Labor Compliance Program should be directed to the City Representative.

B. DIR Registration: California Labor Code Section 1725.5 requires the Contractor and all subcontractors performing Public Works services to be currently registered with the DIR, as specified in California Labor Code Section 1725.5. California Labor Code Section 1771.1 provides that a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the California Public Contract Code), or engage in the performance of any contract for Public Work, unless currently registered and qualified to perform Public Work in accordance with California Labor Code Section 1725.5.

Further information can be found on DIR's website at http://www.dir.ca.gov/Public-Works/Contractors.html. The above summary is provided solely for informational purposes and does not in any way affect the Contractor's and subcontractors' obligation to comply in all respects with all other applicable laws and regulations. The Contractor shall disseminate these provisions to all subcontractors.

Before the performance of work by Contractor or any subcontractor(s) under this Contract, Contractor shall furnish Contractor's and any subcontractors' current DIR registration number(s). The Contractor's current DIR registration number and the current DIR registration number of all subcontractors will be listed on the Subcontractor and LBE Participation Verification Form, incorporated herein.

C. Workers' Compensation Certification. In accordance with California Labor Code Section 1861, by signing this Contract, Contractor acknowledges and represents that Contractor is aware of the provisions of section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and that Contractor will comply with the provisions of the Labor Code before commencing performance under this Contract.

D. Apprentices. If this Contract is for the performance of any Public Work, and the amount of the Contract is $30,000 or more, the Contractor and any subcontractors performing any Public Work under this Contract must comply with and be subject to enforcement under, the provisions of Sacramento City Code Section 3.60.190, Section 1777.5 et seq. of the California Labor Code, and implementing regulations set forth in Title 8 of the California Code of Regulations, governing the employment of apprentices. The Contractor and any subcontractors performing Public Work will be subject to penalties for apprenticeship violations in accordance with Labor Code Section 1777.7.

E. Working Hours. If this Contract is for the performance of any Public Work, Contractor and any subcontractors performing any Public Work under this Contract must comply with and be subject to enforcement under, the provisions of Sacramento City Code Section 3.60.180 and California Labor Code Section 1810 et seq., governing the working hours of employees performing Public Work.

F. Failure to Comply with Labor Compliance. If all applicable labor compliance requirements are not met, the City will have the right to withhold or reject a payment request and/or invoice, in whole or in part, without in any way relieving Contractor or its subcontractors of any obligations under this Contract.

G. Subcontractors. The Contractor shall include these provisions A through F in every subcontract or sub-agreement for any subcontractors performing work under this Contract.

8. PERFORMANCE AND PAYMENT BONDS

Contractor must provide a Performance Bond and a Payment Bond to the City, each for a sum equal to one-hundred percent (100%) of the Contract amount. Each Bond shall be executed by a surety insurer admitted and duly authorized to transact business in the State of California. If the amount of this Contract is increased, Contractor shall increase the amount of the Performance and/or Payment bond if and to the extent required by the City.

9. RETENTION OF SUMS CHARGED AGAINST CONTRACTOR

When, under the provisions of this Contract or any applicable Laws or Regulations, City is authorized or required to withhold, deduct or charge any sum of money against Contractor, City may deduct and retain the amount of such charge from the amount of the next succeeding progress estimate(s), or from any other moneys due or that may become due Contractor from City. If, on completion or termination of the Contract, sums due Contractor are insufficient to pay City's charges, City shall have the right to recover the balance from Contractor or its Sureties.

10. COMMENCEMENT AND PROSECUTION OF WORK

Contractor shall commence the Work not later than fifteen (15) working days after the date of the written Notice to Proceed from City to Contractor and shall diligently prosecute the Work to final completion. The phase "commence the Work" means to engage in a continuous program on-site including, but not limited to, site clearance, grading, dredging, land filling and the fabrications, erection, or installation of the Work. The Notice to Proceed shall be issued within fifteen (15) calendar days following execution of the Agreement by the City and the filing by Contractor of the required Bonds and proof of insurance, provided that the Engineer may delay issuance of the Notice to Proceed if the Engineer determines in the Engineer's sole discretion that conditions on the site of the Work are unsuitable for commencement of the Work. After the Notice to Proceed is issued, the continuous prosecution of Work by Contractor shall be subject only to Excusable Delays as defined in this Agreement.

11. TIME OF COMPLETION

The entire Work shall be brought to completion in the manner provided for in the Contract Documents on or before 20 working days from the date of the Notice to Proceed (hereinafter called the "Completion Date") unless extensions of time are granted in accordance with the Contract Documents.

Failure to complete the entire Work by the Completion Date and in the manner provided for in the Contract Documents shall subject Contractor to liquidated damages as provided in this Agreement. Time is and shall be of the essence in the performance of the Contract and the Work.

12. PAYMENTS DO NOT IMPLY ACCEPTANCE OF WORK

The payment of any progress payment, or the acceptance thereof by Contractor, shall not constitute acceptance of the Work or any portion thereof and shall in no way reduce the

liability of Contractor to replace unsatisfactory work or material, whether or not the unsatisfactory character of such work or material was apparent or detected at the time such payment was made.

13. ACCEPTANCE NOT RELEASE

Contractor shall correct immediately any defective or imperfect work or materials that may be discovered before final acceptance of the entire Work, whether or not such defect or imperfection was previously noticed or identified by the City. The inspection of the Work, or any part thereof, shall not relieve Contractor of any of its obligations to perform satisfactory work as herein specified.

Failure or neglect on the part of City or any of its officers, employees or authorized agents to discover, identify, condemn or reject defective or imperfect work or materials shall not be construed to imply an acceptance of such work or materials, if such defect or imperfection becomes evident at any time prior to final acceptance of the entire Work, nor shall such failure or neglect be construed as barring City from enforcing Contractor's warranty(ies) or otherwise recovering damages or such a sum of money as may be required to repair or rebuild the defective or imperfect work or materials whenever City may discover the same, subject only to any statutes of limitation that may apply to any such claim.

14. CITY'S RIGHT TO TAKE POSSESSION OF THE WORK IN WHOLE OR IN PART

The City shall have the right at any time to enter upon the Work and perform work not covered by this Contract, or to occupy and use a portion of the Work, prior to the date of the final acceptance of the Work as a whole, without in any way relieving Contractor of any obligations under this Contract.

15. NO WAIVER OF REMEDIES

Neither the inspection by City, its officers, employees or agents, nor any certificate or other approval for the payment of money, nor any payment for, nor acceptance of the whole or any part of the Work by City, nor any extensions of time, nor any position taken by City, its officers, employees or its agents shall operate as a waiver of any provision of the Contract Documents nor of any power herein reserved to City or any right to damages herein provided, nor shall any waiver of any breach of this Agreement be held to be a waiver of any other or subsequent breach. All remedies provided in the Contract Documents shall be taken and construed as cumulative; in addition to each and every other remedy herein provided, the City shall have any and all equitable and legal remedies that it would in any case have.

16. WARRANTY

Except as otherwise expressly provided in the Contract Documents, and excepting only items of routine maintenance, ordinary wear and tear and unusual abuse or neglect by City, Contractor warrants and guarantees all Work executed and all supplies, materials and devices of whatsoever nature incorporated in or attached to the Work, or otherwise provided as a part of the Work pursuant to the Contract, to be absolutely free of all defects of workmanship

and materials for a period of one year after final acceptance of the entire Work by the City. Contractor shall repair or replace all work or material, together with any other work or material that may be displaced or damaged in so doing, that may prove defective in workmanship or material within this one year warranty period without expense or charge of any nature whatsoever to City.

In the event that Contractor shall fail to comply with the conditions of the foregoing warranty within ten (10) days after being notified of the defect in writing, City shall have the right, but shall not be obligated, to repair, or obtain the repair of, the defect and Contractor shall pay to City on demand all costs and expense of such repair. Notwithstanding anything herein to the contrary, in the event that any defect in workmanship or material covered by the foregoing warranty results in a condition that constitutes an immediate hazard to public health or safety, or any property interest, or any person, City shall have the right to immediately repair, or cause to be repaired, such defect, and Contractor shall pay to City on demand all costs and expense of such repair. The foregoing statement relating to hazards to health, safety or property shall be deemed to include both temporary and permanent repairs that may be required as determined in the sole discretion and judgment of City.

In addition to the above, the Contractor shall make a written assignment of all manufacturer's and other product warranties to the City, prior to completion and final acceptance of the Work by City.

The Contractor's Performance Bond shall secure the performance of the Contractor's obligations under this Section 16, and the Contractor and its Surety shall be jointly and severally liable for these obligations.

17. LIQUIDATED DAMAGES IF WORK NOT COMPLETED ON TIME

A. The actual fact of the occurrence of damages and the actual amount of the damages that City would suffer if the entire Work, and/or any specified portion thereof, were not completed within the time(s) specified herein are dependent upon many circumstances and conditions that could prevail in various combinations, and for this reason, it is impracticable and extremely difficult to fix the actual damages. Damages that City would suffer in the event of such delay include: loss of the use of the project; expenses of prolonged assignment to the project of an architectural and/or engineering staff; prolonged costs of administration, inspection, and supervision; increased operational expenses and/or impaired operation of other facilities dependent upon completion of the project; and the loss and inconvenience suffered by the public within the City of Sacramento by reason of the delay in the completion of the project or portion thereof. Accordingly, the parties agree, and by execution of this Agreement, Contractor acknowledges that it understands and agrees, that the amount(s) set forth herein as liquidated damages reflect the parties' best efforts at the time of entering into the Contract to estimate the damages that may be incurred by City and the public due to the Contractor's delay in completion of the Work and/or any specified portion thereof, and shall be presumed to be the amount of damages

sustained by the failure of Contractor to complete the entire Work and/or any specified portion thereof within the time(s) specified herein.

B. Contractor shall pay liquidated damages to City for failure to complete the entire Work by the Completion Date (as extended in accordance with the Contract Documents, if applicable) in the amount of $2,500 for each working day after the Completion Date (as extended in accordance with the Contract Documents, if applicable), continuing to the time at which the entire Work is completed. Such amount is the actual cash value agreed upon by the City and Contractor as the loss to City and the public resulting from Contractor's default.

The parties agree, and by execution of this Agreement, Contractor acknowledges that it understands and agrees, that the foregoing provisions provide for the imposition of liquidated damages from the Completion Date (as extended in accordance with the Contract Documents, if applicable) until the date of completion of the entire Work as determined by the Engineer in accordance with Section 8-4 of the Standard Specifications, whether or not the Work or any portion thereof is claimed or determined to be substantially complete prior to such date of completion.

C. In the event Contractor shall become liable for liquidated damages, City, in addition to all other remedies provided by law, shall have the right to withhold any and all payments that otherwise would be or become due Contractor until the liability of Contractor under this section is finally determined. City shall have the right to use and apply such payments, in whole or in part, to reimburse City for all liquidated damages due or to become due to City. Any remaining balance of such payments shall be paid to Contractor only after discharge in full of all liability incurred by Contractor under this section or otherwise under any provision of the Contract Documents or any applicable Law or Regulation. If the sum so retained by City is not sufficient to discharge all such liabilities of Contractor, Contractor shall continue to remain liable to City until all such liabilities are satisfied in full. No failure by City to withhold any payment as specified above shall in any manner be construed to constitute a release of any such liabilities nor a waiver of the City's right to withhold payment for such liabilities.

18. INDEMNITY AND HOLD HARMLESS

A. Contractor shall defend, hold harmless and indemnify the City, its officers, employees, and agents, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, whether arising on or off the site of the Work, including, but not limited to, any fees and/or costs reasonably incurred by City's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death, damage to personal, real or intellectual property or the environment, contractual or other economic damages, or regulatory penalties, arising out of or

in any way connected with performance of or failure to perform the Work by the Contractor, any subcontractor or agent, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not (i) such Liabilities are caused in part by a party indemnified hereunder, or (ii) such Liabilities are litigated, settled or reduced to judgment; provided that the foregoing indemnity does not apply to liability for damages for death or bodily injury to persons, injury to property, or other loss, damage or expense to the extent arising from (i) the sole negligence or willful misconduct of, or defects in design furnished by, City, its agents, servants, or independent contractors who are directly responsible to City, or (ii) the active negligence of City.

B. The existence or acceptance by City of any of the insurance policies or coverages described in this Agreement shall not affect or limit any of City's rights under this Section 18, nor shall the limits of such insurance limit the liability of Contractor hereunder. The provisions of this Section 18 shall survive any expiration or termination of the Contract.

19. CONTRACTOR SHALL ASSUME RISKS

Until the completion and final acceptance by City of all Work under this Contract, the Work shall be under Contractor's responsible care and charge, and Contractor, at no cost to City, shall rebuild, repair, restore and make good all injuries, damages, re-erections, and repairs occasioned or rendered necessary by accidental causes of any nature, to all or any portions of the Work.

20. GENERAL LIABILITY OF CONTRACTOR

Except as otherwise herein expressly stipulated, Contractor shall perform all the Work and furnish all the labor, materials, tools, equipment, apparatus, facilities, transportation, power and light, and appliances, necessary or proper for performing and completing the Work herein required in the manner and within the time herein specified. The mention of any specific duty or liability of Contractor shall not be construed as a limitation or restriction of any general liability or duty of Contractor, and any reference to any specific duty or liability shall be construed to be solely for the purpose of explanation.

21. INSURANCE

During the entire term of the Contract, Contractor shall maintain the insurance coverage described in this Section 21.

Full compensation for all premiums that Contractor is required to pay for the insurance coverage described herein shall be included in the compensation specified for the Work performed by Contractor under this Contract. No additional compensation will be provided for Contractor's insurance premiums. Any available insurance proceeds in excess of the specified minimum limits and coverages shall be available to the City.

If the Contractor maintains broader coverage and/or higher limits than the minimums shown below, the City requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the City.

A. Minimum Scope & Limits of Insurance Coverage

(1) Commercial General Liability Insurance is required providing coverage at least as broad as ISO CGL Form 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property damage, and personal injury, arising out of activities performed by or on behalf of Contractor and its subcontractors, products and completed operations of Contractor and its subcontractors, and premises owned, leased, or used by Contractor and its subcontractors, with limits of not less than two million dollars ($2,000,000) per occurrence. The policy shall provide contractual liability and products and completed operations coverage for the term of the policy. If a general aggregate limit applies, either the general aggregate limit shall apply separately (ISO CG 25 03 or 25 04) or the general aggregate limit shall be twice the required occurrence limit.

The City, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects general liability arising out of: activities performed by or on behalf of Contractor and subcontractors; products and completed operations of Contractor and subcontractors; and premises owned, leased, or used by Contractor and subcontractors.

(2) Automobile Liability Minimum Scope and Limits of Insurance Coverage. (*Check the applicable provision*)

[X] Automobile Liability Insurance is required providing coverage at least as broad as ISO Form CA 00 01 for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than one million dollars ($1,000,000) per occurrence. The policy shall provide coverage for owned, non-owned and/or hired autos as appropriate to the operations of the Contractor.
The City, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects auto liability.

[ ] No automobile liability insurance is required, and by signing this Contract, Contractor certifies as follows:

"Contractor certifies that a motor vehicle will not be used in the performance of any work or services under this agreement. If,

however, Contractor does transport items under this Contract, or this Contract is amended to require any employees of Contractor to use a vehicle to perform services under the Contract, Contractor understands that it must maintain and provide evidence of Automobile Liability Insurance providing coverage at least as broad as ISO Form CA 00 01 for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than one million dollars ($1,000,000*)* per occurrence. The policy shall provide coverage for owned, non-owned and/or hired autos as appropriate to the operations of the Contractor."

(3) Excess Insurance: The Contractor may use Umbrella or Excess Policies to meet the required liability limits. This form of insurance will be acceptable provided that any umbrella or excess policies provide all of the insurance coverages required and meet the other requirements for the primary policies as set forth in this Agreement. Umbrella and/or Excess policies shall be provided on a true "following form" or broader coverage basis, with coverage at least as broad as provided in the underlying primary policy.

Umbrella or excess policies shall contain, or be endorsed to provide that the City, its officials, employees, and volunteers shall be covered as additional insureds, as well as a provision that it will apply on a primary basis for the benefit of the City. Any insurance or self-insurance maintained by City, its officials, employees, or volunteers will be in excess of Contractor's umbrella or excess coverage and will not contribute to it. No insurance or self-insurance maintained by the City that applies to a loss covered herein, whether Primary or Excess, and which also applies to a loss covered hereunder, shall be called upon to contribute to a loss until the Contractor's Primary and Excess liability policies are exhausted.

.

(4) Workers' Compensation Minimum Scope and Limits of Insurance Coverage. (*Check all applicable provisions*)

[X] Workers' Compensation Insurance is required with statutory limits and Employers' Liability Insurance with limits of not less than one million dollars ($1,000,000). The Workers' Compensation policy shall include a waiver of subrogation in favor of the City.

[ ] No work or services will be performed on or at CITY facilities or CITY Property, therefore a Workers' Compensation waiver of subrogation in favor of the CITY is not required.

___ No Workers' Compensation insurance is required, and by signing this Contract, Contractor certifies as follows:

"Contractor certifies that its business has no employees, and that it does not employ anyone, and is therefore exempt from the legal requirements to provide Workers' Compensation insurance. If, however, Contractor hires any employee during the term of this Contract, Contractor understands that Workers' Compensation with statutory limits and Employer's Liability Insurance with a limit of not less than one million dollars ($1,000,000) is required. The Workers' Compensation policy will include a waiver of subrogation in favor of the City."

B. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

(1) Contractor's insurance coverage, including excess insurance, shall be primary and non-contributory insurance as respects City, its officials, employees, and volunteers. Any insurance or self-insurance maintained by City, its officials, employees, or volunteers will be in excess of Contractor's insurance and will not contribute with it.

(2) Any failure to comply with reporting provisions of the policies will not affect coverage provided to City, its officials, employees, or volunteers.

(3) Coverage shall state that Contractor's 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.

(4) City will be provided with thirty (30) days written notice of cancellation or material change in the policy language or terms.

C. Waiver of Subrogation.

Contractor hereby grants to City a waiver of any right to subrogation which any insurer may acquire against the City by virtue of the payment of any loss under such insurance. Contractor agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation, but this provision applies regardless of whether or not the City has received a waiver of subrogation endorsement from an insurer.

D. Acceptability of Insurance

Insurance shall be placed with insurers with a Bests' rating of not less than A:VI. Self-insured retentions, policy terms or other variations that do not comply with the requirements of this Section 21 must be declared to and approved by the City in writing prior to execution of this Contract.

E. Verification of Coverage

(1) Contractor shall furnish City with certificates and required endorsements evidencing the insurance required. Copies of policies shall be delivered to the City on demand. Certificates of insurance must be signed by an authorized representative of the insurance carrier. Copies of policies shall be delivered to the City Representative on demand.

(2) Contractor shall send all insurance certificates and endorsements, including policy renewals, during the term of this Contract directly to:

City of Sacramento
c/o Exigis LLC
PO Box 947
Murrieta, CA 92564

(3) Certificate Holder must be listed as:

City of Sacramento
c/o Exigis LLC
PO Box 947
Murrieta, CA 92564

(4) The City may withdraw its offer of contract or cancel this Contract if the certificates of insurance and endorsements required have not been provided prior to execution of this Contract. The City may withhold payments to Contractor or cancel the Contract if the insurance is canceled or Contractor otherwise ceases to be insured as required herein.

F. Subcontractors

Contractor shall require and verify that all subcontractors maintain insurance coverage that meets the minimum scope and limits of insurance coverage specified in this Section 21.

22. FAILURE TO MAINTAIN BONDS OR INSURANCE

If, at any time during the performance of this Contract, Contractor fails to maintain any item of the bonds and/or insurance required under the Contract in full force and effect, Contractor shall immediately suspend all work under the Contract and notify City in writing of such

failure. After such notice is provided, or if City discovers such failure and notifies Contractor, the City thereafter may withhold all Contract payments due or that become due until notice is received by City that such bonds and/or insurance have been restored in full force and effect and that the premiums therefor have been paid for a period satisfactory to the Division of Risk Management. Contractor shall not resume work until notified by City to do so, and the City shall have no responsibility or liability for any costs incurred by Contractor as a result of such suspension of Work.

In addition to the foregoing, any failure to maintain any item of the required bonds and/or insurance at any time during the performance of this Contract will be sufficient cause for termination of the Contract by City.

The Contractor shall be solely responsible for, and shall defend, indemnify and hold harmless the City, its officers, employees and agents against and from, any and all damages, claims, losses, actions, costs or other expenses of any kind incurred by any party as a direct or indirect result of any suspension of Work or termination of the Contract under the provisions of this Section 22.

23. EXCUSABLE DELAYS

For the purpose of these Contract Documents, the term "Excusable Delay" shall mean, and is limited to, delay caused directly by: acts of God; acts of a public enemy; fires; inclement weather as determined by the Engineer; riots; insurrections; epidemics; quarantine restrictions; strikes; lockouts; sitdowns; acts of a governmental agency; priorities or privileges established for the manufacture, assemble, or allotment of materials necessary in the Work by order, decree or otherwise of the United States or by any department, bureau, commission, committee, agent, or administrator of any legally constituted public authority; changes in the Work ordered by City insofar as they necessarily require additional time in which to complete the Work; the prevention of Contractor from commencing or prosecuting the Work because of the acts of others, excepting Contractor's subcontractors or suppliers; or the prevention of Contractor from commencing or prosecuting the Work because of a Citywide failure of public utility service.

The term "Excusable Delay" shall specifically not include: (i) any delay that could have been avoided by the exercise of care, prudence, foresight and diligence on the part of Contractor; (ii) any delay in the prosecution of any part of the Work that does not constitute a Controlling Operation, whether or not such delay is unavoidable; (iii) any reasonable delay resulting from time required by City for review of any Contractor submittals and for the making of surveys, measurements and inspection; and, (iv) any delay arising from an interruption in the prosecution of the Work on account of reasonable interference by other Contractors employed by City that does not necessarily prevent the completion of the entire Work within the time specified. Excusable Delays, if any, shall operate only to extend the Completion Date (not in excess of the period of such delay as determined by City) and shall not under any circumstances increase the amount City is required to pay Contractor except as otherwise provided in these Contract Documents.

24. CONTRACTOR TO SERVE NOTICE OF DELAYS

Whenever Contractor foresees any delay in the prosecution of the Work, and in any event as soon as possible (not to exceed a period of ten (10) calendar days) after the initial occurrence of any delay that Contractor regards as or may later claim to be an Excusable Delay, the Contractor shall notify the Engineer in writing of such delay and its cause, in order that the Engineer: (i) may take immediate steps to prevent if possible the occurrence or continuance of the delay; or (ii) if this cannot be done, may determine whether the delay is to be considered excusable, how long it continues, and to what extent the prosecution and completion of the Work are delayed thereby. Said written notice shall constitute an application for an extension of time only if the notice requests such an extension and sets forth the Contractor's estimate of the additional time required together with a full description of the cause of the delay relied upon.

After the completion of any part or whole of the Work, the Engineer, in estimating the amount due Contractor, will assume that any and all delays that may have occurred in its prosecution and completion were not Excusable Delays, except for such delays for which the Contractor has provided timely written notice as required herein, and that the Engineer has found to be excusable. Contractor shall not be entitled to claim Excusable Delay for any delay for which the Contractor failed to provide such timely written notice.

25. EXTENSION OF TIME

If the Contractor complies with Section 24, above, and the Engineer finds a delay claimed by the Contractor to be an Excusable Delay, the Contractor shall be allowed an extension of time to complete the Work that is proportional to the period of Excusable Delay determined by the Engineer, subject to the approval by City of a change order granting such time extension. During a duly authorized extension for an Excusable Delay, City shall not charge liquidated damages against the Contractor for such delay.

If the City extends the time to complete the Work as provided herein, such extension shall in no way release any warranty or guarantee given by Contractor pursuant to the provisions of the Contract Documents, nor shall such extension of time relieve or release the sureties of the Bonds provided pursuant to the Contract Documents. By executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such extension of time. The granting of any extension of time as provided herein shall in no way operate as a waiver on the part of City of its rights under this Contract, excepting only extension of the Completion Date for such period of Excusable Delay as may be determined by the Engineer and approved by a duly authorized change order.

26. NO PAYMENT FOR DELAYS

No damages or compensation of any kind shall be paid to Contractor or any subcontractor because of delays in the progress of the Work whether or not such delays qualify for extension of time under this Agreement; except that this provision shall not preclude the recovery of damages for a delay caused by the City that is unreasonable under the circumstances and that is not within the contemplation of the parties, provided that the Contractor timely submits all such written notice(s) and fully complies with such other

procedures as may be specified in the Contract Documents or any Laws or Regulations for Contractor to claim damages for such delay.

27. CHANGES IN THE WORK

Changes in the Work authorized or directed in accordance with the Contract Documents and extensions of time of completion made necessary by reason thereof shall not in any way release any warranty or guarantee given by Contractor pursuant to the provisions of the Contract Documents, nor shall such changes in the Work relieve or release the Sureties on Bonds provided pursuant to the Contract Documents. By executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such change in Work and to any extension of time made by reason thereof.

28. TERMINATION AFTER COMPLETION DATE

In addition to any other rights City may have, if any services or work required under the Contract (including but not limited to punch list items) are not completed as of the Completion Date (as adjusted by any extensions of time for Excusable Delays granted pursuant to the Contract Documents), City may terminate the Contract at any time after the Completion Date (as adjusted by any extensions of time for Excusable Delays granted pursuant to the Contract Documents), by providing a written notice to Contractor specifying the date of termination. Such notice also may specify conditions or requirements that Contractor must meet to avoid termination of the Contract on such date. If Contractor fails to fulfill all such conditions and requirements by such termination date, or, if no such conditions or requirements are specified, Contractor shall cease rendering services and performing work on such termination date, and shall not be entitled to receive any compensation for services rendered or work performed after such termination date. In the event of such termination, Contractor shall remain liable to City for liquidated damages incurred for any period of time prior to the termination date.

In addition to any other charges, withholdings or deductions authorized under the Contract or any Laws or Regulations, if City terminates the Contract pursuant to this section, City may withhold and deduct from any payment and/or retention funds otherwise due Contractor any sum necessary to pay the City's cost of completing or correcting, or contracting for the completion or correction of, any services or work under the Contract that are not completed to the satisfaction of the City or that otherwise are deficient or require correction as of such termination date, including but not limited to incomplete punch list items. Such costs shall include all of the City’s direct and indirect costs incurred to complete or correct such services or work, including the City’s administrative and overhead costs. If the amount of payment(s) and/or retention funds otherwise due the Contractor are insufficient to pay such costs, City shall have the right to recover the balance of such costs from the Contractor and/or its Surety(ies).

29. TERMINATION FOR CONVENIENCE

Upon written notice to the Contractor, the City may at any time, without cause and without prejudice to any other right or remedy of the City, elect to terminate the Contract for the

convenience of City. In such case, the Contractor shall be paid (without duplication of any items, and after deduction and/or withholding of any amounts authorized to be deducted or withheld by the Contract Documents or any Laws or Regulations):

A. For Work executed in accordance with the Contract Documents prior to the effective date of termination and determined to be acceptable by the Engineer, including fair and reasonable sums for overhead and profit on such Work;

B. For reasonable claims, costs, losses, and damages incurred in settlement of terminated contracts with subcontractors, suppliers, and others; and

C. For reasonable expenses directly attributable to termination.

Contractor shall not be paid for any loss of anticipated profits or revenue for any Work not performed prior to termination, nor for any economic loss arising out of or resulting from such termination, except for the payments listed in this section. Contractor's warranty under Section 16 of this Agreement shall apply, and Contractor shall remain responsible for all obligations related to such warranty, with respect to all portions of the Work performed prior to the effective date of the termination for convenience pursuant to this section. The City shall be entitled to have any or all remaining Work performed by other contractors or by any other means at any time after the effective date of a termination for convenience pursuant to this section.

30. TERMINATION FOR BREACH OF CONTRACT

If Contractor abandons the Work under this Contract, or if the Contract or any portion of the Contract is sublet or assigned without the consent of the City, or if the Engineer determines in the Engineer's sole discretion that the conditions of the Contract in respect to the rate of progress of the Work are not being fulfilled or any part thereof is unnecessarily delayed, or if Contractor violates or breaches, or fails to execute in good faith, any of the terms or conditions of the Contract, or if Contractor refuses or fails to supply enough properly skilled labor or materials or refuses or fails to make prompt payment to subcontractors for material or labor, or if Contractor disregards any Laws or Regulations or proper instruction or orders of the Engineer, then, notwithstanding any provision to the contrary herein, the City may give Contractor and its Sureties written notification to immediately correct the situation or the Contract shall be terminated.

In the event that such notice is given, and, in the event such situation is not corrected, or arrangements for correction satisfactory to the City are not made, within ten (10) calendar days from the date of such notice or within such other period of time as may be specified by the City in the notice, the Contract shall upon the expiration of said period cease and terminate. In the event of any such termination, City may take over the Work and prosecute the Work to completion, or otherwise, and the Contractor and its Sureties shall be liable to City for any cost occasioned City thereby, as hereinafter set forth.

In the event City completes the Work, or causes the Work to be completed, no payment of any kind shall be made to Contractor until the Work is complete. The cost of completing the

Work, including but not limited to, extra costs of project administration and management incurred by City, both direct or indirect, shall be deducted from any sum then due, or that becomes due, to Contractor from City. If sums due to Contractor from City are less than the cost of completing the Work, Contractor and its Sureties shall pay City a sum equal to this difference on demand. In the event City completes the Work, and there is a sum remaining due to Contractor after City deducts the costs of completing the Work, then City shall pay such sum to Contractor. The Contractor and Contractor's Sureties shall be jointly and severally liable for all obligations imposed on Contractor hereunder.

No act by City before the Work is finally accepted, including, but not limited to, exercise of other rights under the Contract, actions at law or in equity, extensions of time, payments, assessments of liquidated damages, occupation or acceptance of any part of the Work, waiver of any prior breach of the Contract or failure to take action pursuant to this section upon the happening of any prior default or breach of Contractor, shall be construed to be a waiver or estoppel of the City's right to act pursuant to this Section upon any subsequent event, occurrence or failure by Contractor to fulfill the terms and conditions of the Contract. The rights of City to terminate the Contract pursuant to this Section and pursuant to Sections 28 and 29 are cumulative and are in addition to all other rights of City pursuant to the Contract and at law or in equity.

31. CONTRACTOR BANKRUPT

If Contractor should commence any bankruptcy proceeding, or if Contractor is adjudged a bankrupt, or if Contractor makes any assignment for the benefit of creditors, or if a receiver is appointed on account of Contractor's insolvency, then the City may, without prejudice to any other right or remedy, terminate the Contract and complete the work by giving notice as provided in Section 30 above.

32. SURETIES' OBLIGATIONS UPON TERMINATION

If the City terminates the Contract pursuant to Section 30 or Section 31 above:

A. The Surety under Contractor's performance bond shall be fully responsible for all of the Contractor's remaining obligations of performance under the Contract as if the Surety were a party to the Contract, including without limitation Contractor's obligations, as provided in the Contract Documents, to complete and provide a one-year warranty of the entire Work, pay liquidated damages and indemnify, defend and hold harmless City, up to the full amount of the performance bond.

B. The Surety under Contractor's payment bond shall be fully responsible for the performance of all of the Contractor's remaining payment obligations for work, services, equipment or materials performed or provided in connection with the Work or any portion thereof, up to the full amount of the payment bond.

33. ACCOUNTING RECORDS OF CONTRACTOR

During performance of the Contract and for a period of three (3) years after completing

the entire Work, Contractor shall maintain all accounting and financial records related to the Contract and performance of the Work in accordance with generally accepted accounting practices, and shall keep and make such records available for inspection and audit by representatives of the City upon reasonable written notice.

34. REPRESENTATIVES OF THE PARTIES.

A. City Engineer.

(1) The Engineer for this Contract is:

Carlos Barragan / Assistant Engineer
1395 35th Ave Sacramento, CA 95822
916-808-4030/cbarragan@cityofsacramento.org

(2) All Contractor questions and correspondence pertaining to this Contract must be addressed to the Engineer. In the event the City hires a third-party consultant to assist with construction management, the Engineer may direct Contractor to copy such consultant on questions and correspondence, but such a request does not constitute a delegation of authority to the third-party consultant to serve as the Engineer (i.e., any alterations, deviations, additions to, or deletions from the Work or any of the Contract Documents, must be authorized by the Engineer, not a third-party consultant, pursuant to a properly executed change order).

B. Contractor Representative.

(1) The Contractor Representative for this Contract is:

TNT Industrial Contractors Inc.
3800 Happy Lane Sacramento, CA 95827
916-395-8400/estimating@tntindustrial.com

(2) All City questions pertaining to the Contract shall be referred to the Contractor Representative. All correspondence to Contractor shall be addressed to the Contractor Representative.

C. Notice. Whenever the Contract Documents require that notice be provided to the other party, notice will be deemed to have been validly given: (i) if delivered in person to the individual intended to receive such notice; (ii) four (4) days after being sent by registered or certified mail, postage prepaid to the address indicated in the Contract; or (iii) if transmitted by email, by the time stated on the intended recipient's email.

35. USE TAX REQUIREMENTS

During the performance of this Agreement, Contractor, for itself, its assignees and successors in interest, agrees as follows:

A. Use Tax Direct Payment Permit: For all leases and purchases of materials, equipment, supplies, or other tangible personal property used to perform the Agreement and shipped from outside California, the Contractor and any subcontractors leasing or purchasing such materials, equipment, supplies or other tangible personal property shall obtain a Use Tax Direct Payment Permit from the California State Board of Equalization ("SBE") in accordance with the applicable SBE criteria and requirements.

B. Sellers Permit: For any construction contract and any construction subcontract in the amount of $5,000,000 or more, Contractor and the subcontractor(s) shall obtain sellers permits from the SBE and shall register the jobsite as the place of business for the purpose of allocating local sales and use tax to the City. Contractor and its subcontractors shall remit the self-accrued use tax to the SBE, and shall provide a copy of each remittance to the City.

C. The above provisions shall apply in all instances unless prohibited by the funding source for the Agreement.

36. NON-DISCRIMINATION IN EMPLOYEE BENEFITS

This Agreement may be subject to the requirements of Sacramento City Code Chapter 3.54, Non-Discrimination in Employee Benefits by City Contractors. The Contract Documents include a summary of the requirements of Sacramento City Code Chapter 3.54, entitled "Requirements of the Non-Discrimination in Employee Benefits Code." By signing this Agreement, Contractor acknowledges and represents that Contractor has read and understands these requirements and agrees to fully comply with all applicable requirements of Sacramento City Code Chapter 3.54. If requested by City, Contractor agrees to promptly provide such documents and information as may be required by City to verify Contractor's compliance. Any violation by Contractor of Sacramento City Code Chapter 3.54 constitutes a material breach of this Agreement, for which the City may terminate the Agreement and pursue all available legal and equitable remedies.

37. CONSIDERING CRIMINAL CONVICTION INFORMATION IN THE EMPLOYMENT APPLICATION PROCESS

This Agreement may be subject to the requirements of Sacramento City Code Chapter 3.62, Procedures for Considering Criminal Conviction Information in the Employment Application Process. The Contract Documents include a summary of the requirements of Sacramento City Code Chapter 3.62, entitled "Ban-The-Box Requirements." By signing this Agreement, Contractor acknowledges and represents that Contractor has read and understands these requirements and agrees to fully comply with all applicable requirements of Sacramento City Code Chapter 3.62. If requested by City, Contractor agrees to promptly provide such documents and information as may be required by City to verify Contractor's compliance. Any violation by Contractor of Sacramento City Code Chapter 3.62 constitutes a material breach of this Agreement, for which the City may

terminate the Agreement and pursue all available legal and equitable remedies. Contractor agrees to require its subcontractors to fully comply with all applicable requirements of Sacramento City Code Chapter 3.62, and include these requirements in all subcontracts covered by Sacramento City Code Chapter 3.62.

38. DEBARMENT CERTIFICATION

A. Pursuant to 2 CFR, Part 200, and applicable Executive Orders, the City is restricted in its ability to contract with certain parties that are debarred, suspended, or otherwise excluded or ineligible for participating in Federal assistance programs or activities. By signing this Agreement, CONTRACTOR warrants and certifies under penalty of perjury under the laws of the State of California that Contractor, including any owner, partner, director, officer, or principal of the CONTRACTOR, or any person in a position with management responsibility or responsibility for the administration of federal funds:

(1) Is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal or state department/agency;

(2) Has not within a three-year period preceding this certification been convicted of or had a civil judgment rendered against it for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public transaction or contract (federal, state, or local); violation of federal or state antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, receiving stolen property, or other criminal felony;

(3) Is not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph (b) above; or

(4) Has not, within a three-year period preceding this certification, had one or more public contracts (federal, state, or local) or transactions terminated for cause or default.

(5) Has not been notified, within a three-year period preceding this certification, been notified of any delinquent Federal taxes in an amount that exceeds $3,500 for which the liability remains unsatisfied. Federal taxes are considered delinquent if the tax liability has been finally determined and the taxpayer is delinquent in making payment, as defined in Section 52.209-5 of the Federal Acquisition Regulations.

B. Contractor further warrants and certifies that it shall not knowingly enter into any transaction with any subcontractor, material supplier, or vendor who is debarred, suspended, declared ineligible, or voluntarily excluded from covered transactions

by any federal or state department/agency. Any exceptions to the warranties and certifications in this Section must be disclosed to the City.

C. Exceptions will not necessarily result in denial of recommendation for award, but will be considered in determining Contractor's responsibility. Disclosures must indicate to whom exceptions apply, the initiating agency, and dates of action.

D. City will review the Federal Government's System for Award Management Exclusions maintained by the General Services Administration for eligibility, prior to the execution of this Agreement. The Contractor shall provide immediate written notice to the City if, at any time prior to execution, the Contractor learns this certification is erroneous or has become erroneous by reason of changed circumstances. If it is later determined that the Contractor's warranties and certification in this Section were erroneous, the City may terminate this Agreement for default.

39. COMMUNITY WORKFORCE TRAINING AGREEMENT *(Check below if the engineer's estimate of the total construction cost of the project or the actual cumulative bid amounts submitted by Contractor exceed $1,000,000.*)

☐ The work to be completed under this Agreement is subject to the City's Community Workforce Training Agreement ("CWTA") and CWTA Program. A copy of the CWTA and summary of its requirements are attached hereto as Exhibit X.

Prior to executing this Agreement, Contractor has executed Addendum A to the CWTA. All subcontractors (listed or hired after the time of bid or award) must also execute Addendum A to the CWTA prior to performing any Work.

Contractor must include the provisions of this section, as well as a copy of Exhibit X, in every subcontract for Work covered by the CWTA.

Failure to sign and submit Addendum A shall be grounds for subcontractor substitution and/or for the City to withhold payment for the Work performed in the absence of the necessary Addendum A. Failure to satisfy the requirements of the CWTA and demonstrate a good faith effort to meet any Local Hire and Priority Apprentice Goals (if applicable), may result in a determination that the Contractor does not meet the City's minimum qualifications to bid on future projects for the City of Sacramento.

City of SACRAMENTO
Department of Utilities

ENGINEERING SERVICES DIVISION

CONTRACT SPECIFICATIONS
FOR

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

Engineer's Estimate: $845,000

Non-Mandatory Pre-Bid Meeting
February 3, 2026 at 9:00am
7501 College Town Drive, Sacramento, CA 95826

For Pre-Bid Information Call:

Carlos Barragan
Assistant Engineer
(916) 808-4030

Separate Plans

Bid to be received before 2:00 PM
February 11, 2025
Security Desk, 1st Floor (City Clerk in-box)
New City Hall
915 I Street, Sacramento, CA 95814

LBE PROGRAM PARTICIPATION

For information on meeting the City of Sacramento's Local Business Enterprise (LBE) project goals, please contact Procurement Services at (916) 808-6240, or visit the City of Sacramento's small business web site at: http://portal.cityofsacramento.org/Finance/Procurement/Bid-Information#bidding-options

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement

TABLE OF CONTENTS

INVITATION TO BID

LBE INFORMATION

NOTICE TO CONTRACTORS

BAN THE BOX

DEPARTMENT OF INDUSTRIAL RELATIONS NEWSLINE

PROPOSAL FORMS (TO BE SUBMITTED BY ALL BIDDERS AS THE BID PAGE)

Sealed Proposal

Bid Proposal Guarantee

Subcontractor and LBE Participation Verification

Drug-Free Workplace Policy and Affidavit

Minimum Qualifications Questionnaire

Requirements of the Non-Discrimination in Employee Benefits Code

Construction and Demolition (C&D) Debris Recycling Requirements

LBE Requirements (City Contracts no Federal Funds Used)

CONTRACT FORMS (Only for successful Bidder)

Worker's Compensation Insurance Certification

Agreement

Bonds
- Performance Bond
- Payment Bond

CWTA Requirements

C & D Waste Management Plan

C &D Debris Haulers & Facilities

C & D Debris Waste Log

CALIFORNIA LABOR CODE RELATING TO APPRENTICES
http://www.dir.ca.gov/dlse/dlsePublicWorks.html

TAX FORMS (REQUIRED UPON AWARD)
W-9.....https://www.irs.gov/pub/irs-pdf/fw9.pdf
CA Form 590 https://www.ftb.ca.gov/forms/2026/2026-590.pdf
CA Form 587.....https://www.ftb.ca.gov/forms/2025/2025-587.pdf

SPECIAL PROVISIONS

City of SACRAMENTO
Department of Utilities

ENGINEERING & WATER RESOURCES DIVISION

1395 35th AVENUE
SACRAMENTO, CA
95822-2911

PH 916-808-1400
FAX 916-808-1497

E.A. FAIRBAIRN WTP GRIT SEPERATOR RAKE ARM REPLACEMENT
(PN: Z14130234)

ADDENDUM #01

January 22, 2026

To All Potential Bidders:

Attached hereto are addenda items, which shall be incorporated into the Notice to Contractors, Sealed Proposal, Construction Agreement, Engineers Estimate, Special Provisions and Project Plans for the above noted project. These changes shall be considered as part of the original documents, as if they were originally provided therein, and as such shall be used as contractual documents. All other terms, conditions, and specifications of the bid remain unchanged. Bidders must acknowledge receipt of this addendum prior to the hour and date specified for bids to be received by one of the following methods:

(a) By acknowledging receipt on the sealed proposal in the space provided.
(b) By separate letter that includes a reference to the Project Name and the Addendum Number.

Failure to acknowledge receipt of this addendum in one of the above methods and cause acknowledgment to be received prior to the hour and date specified for receipt of proposals **may result in rejection of your proposal**. If by virtue of this addendum you decide to change a proposal already submitted, such change may be made by letter, provided such letter makes reference to the Project Name and this Addendum, and is received prior to the hour and date specified for receipt of proposals.

For any questions related to this addendum, contact the Project Manager, Carlos Barragan at (916) 808-4030.

Sincerely,

_____
Carlos Barragan, Assistant Civil Engineer

Addendum
Enclosure

cc: Distribution List
Planholders

ADDENDUM NO. 01 DATE: January 22, 2026

E.A. FAIRBAIRN WTP GRIT SEPERATOR RAKE ARM REPLACEMENT (PN: Z14130234)

1. BID ITEM DESCRIPTIONS ADDED TO BID DOCUMENTS

   Three pages are being added to the bid. The BID ITEM DESCRIPTIONS are being incorporated into the required bid documents.

BID ITEM DESCRIPTIONS

The items described below correspond to the items on the Bid Schedule. It is understood that the Contractor shall furnish all labor, equipment, materials, tools, parts, and other items necessary to complete the work as shown on the Drawings and described in the Specifications.

ITEM 1. Center Pier and Drive Cage Coating

A. Description:

The work to be performed for this item includes removing the coating from the center column surface, remove coating of drive cage, assess and replace drive cage members that have experience extensive corrosion, preparation of exterior surface for coating application (including but not limited to surface preparation and protecting surfaces/materials not to be coated), surface coating application, waste disposal, and any other related work required to complete the exterior coating of the Grit Separator Rake Arm Center Pier and Drive Cage as indicated in the Drawings and Specifications. This includes labor, furnishing of equipment, all materials as required for a complete surface preparation and coating application, 25-year warranty, and waste disposal.

B. Measurement and Payment:

Coating areas shall be measured and paid on lump sum basis. For the bidding purposes contractor shall assume outside diameter of center pier to be 3’ 6” and 8’ 6” tall (field verification required for exact measurements). Up to 20% of the line-item price may be requested by the Contractor upon completion of the removal of the existing coating and surface preparation for the new coating. Verification of valid manufacturer’s warranty shall also be provided with the request for final payment. All Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 2. Grit Basin Cleaning

A. Description:

This item shall include all materials, tools, equipment, labor, parts and other items necessary to clean Grit Basin at required project stages. Grit Basin shall be clean of any debris caused by the demo and installation of the Rake Arm and Drive Cage installation Aswell as the work associated with the ladder, handrail, and fall protection base installation.

B. Measurement and Payment:

Grit Basin Cleaning shall be measured and paid on a lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts, and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 3. Rake Arm Replacement

A. Description:

This item includes but not be limited to removal of existing rake arms, installation of new 316 stainless steel rake arm and all associated componentry, nuts, bolts, wear shoes,

adjustable flight, 25-year warranty, and any other items associated with the rake arm replacement.

The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary to remove and replace rake arm and drive cage as indicated on the Drawings and in the specifications.

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 4. Ladder and Fall Arrest System Install

A. Description:

This item includes, but not be limited to removal of old ladder system, grouting of old penetrations from the existing ladder system, anchorage calcs for new anchoring points, rebar scanning, installation of OSHA compliant fall arrest system, and installation of new 316 stainless steel ladder system including any other items associated with the ladder install. The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary for furnishing, and installing a new OSHA compliant exterior stainless steel ladder system as shown in the Drawings and described in the Specifications.

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 5. Handrail Install

A. Description:

This item includes, but not be limited to removal of section of existing handrail system, stabilizing existing handrail system that had been modified, rebar scanning for penetrations, anchoring post bases, grouting of old penetrations from the existing handrail system, rebar scanning, and installation of new handrail system including any other items associated with the handrail install. The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary for furnishing, and installing a new OSHA compliant exterior handrail system as shown in the Drawings and described in the Specifications

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 6. Warranties

A. Description:

This item shall include one (1) warranty from installer as listed:

1. 2-year warranty of work and materials for rake arm, drive cage, ladders, handrail, and associated equipment.

Product warranties, including 25 year warranty on coating of drive cage and center pier are expected be from manufacturer and be covered by associated installation line item.

B. Measurement and Payment:

Warranties shall be measured and paid on a lump sum basis upon completion of all work elements and acceptance by City. Measurement shall be based on the percentage of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all supervision, labor, materials, tools, and equipment necessary to complete the work under this item.

END OF BID ITEMS DESCRIPTIONS

City of SACRAMENTO
Department of Utilities

ENGINEERING & WATER RESOURCES DIVISION

1395 35th AVENUE
SACRAMENTO, CA
95822-2911

PH 916-808-1400
FAX 916-808-1497

E.A. FAIRBAIRN WTP GRIT SEPERATOR RAKE ARM REPLACEMENT
(PN: Z14130234)

ADDENDUM #02

February 9, 2026

To All Potential Bidders:

Attached hereto are addenda items, which shall be incorporated into the Notice to Contractors, Sealed Proposal, Construction Agreement, Engineers Estimate, Special Provisions and Project Plans for the above noted project. These changes shall be considered as part of the original documents, as if they were originally provided therein, and as such shall be used as contractual documents. All other terms, conditions, and specifications of the bid remain unchanged. Bidders must acknowledge receipt of this addendum prior to the hour and date specified for bids to be received by one of the following methods:

(a) By acknowledging receipt on the sealed proposal in the space provided.
(b) By separate letter that includes a reference to the Project Name and the Addendum Number.

Failure to acknowledge receipt of this addendum in one of the above methods and cause acknowledgment to be received prior to the hour and date specified for receipt of proposals **may result in rejection of your proposal**. If by virtue of this addendum you decide to change a proposal already submitted, such change may be made by letter, provided such letter makes reference to the Project Name and this Addendum, and is received prior to the hour and date specified for receipt of proposals.

Please submit any questions via PlanetBids only.

Sincerely,

Carlos Barragan, Assistant Civil Engineer

Addendum
Enclosure

cc: Distribution List
Planholders

ADDENDUM NO. 02 DATE: February 9, 2026

E.A. FAIRBAIRN WTP GRIT SEPERATOR RAKE ARM REPLACEMENT (PN: Z14130234)

1. **Bid Due Date Extended to February 18, 2026 by 2:00PM**

2. **Revisions to Bid Package Documents:**

   i. **Revision to BID ITEM DESCRIPTIONS:**

      1. Delete *BID ITEM DESCRIPTIONS* pages in Bid Package attachment and replace with updated *Addendum 2 BID ITEM DESCRIPTIONS*. Changes are highlighted in grey, and deletions are marked with a ~~strikethrough~~.
      2. Document is included in this addendum as *Addendum 2 BID ITEM DESCRIPTIONS*

   ii. **Project Specifications**

      1. Section 09_96_01 High Performance Coatings
         - Replace sub section 1.09 Technical Representative Responsibilities with revised sub section 1.09 MANUFACTURERS PARTICIPATION
         - Add sub section 1.10 WARRANTY
         - Add section 1.11 Warranty Inspection
         - Replace section 1.05 QUALITY ASSURANCE D. Field Samples with revised section 1.05 QUALITY ASSURANCE D. Field Samples
      2. These revisions are captured in Addendum 2 Specification Section 09_ 96_01 High Performance Coatings. Changes are highlighted in grey, and deletions are marked with a ~~strikethrough~~. Delete previous Spec Section 09_96_01 High Performance Coatings and replace with corresponding Addendum 2 Specification Section 09_ 96_01 High Performance Coatings.

3. **Pre-Bid Project Site Walk:**

   i. Pre-Bid Sign In Sheet
   ii. Questions from Pre-Bid Project Site Walk
      1. Q: Will the pump and associated pipping shown in Photo 1 on plan sheet 00SM01 be relocated prior to construction of Bid Item 5 Handrail Install?
         A: Bid Item 5 Handrail Install has been modified to include the relocation of the pump and associated sample piping.

4. **<u>Revisions to Attachment 2. Excerpt from 1962 Original Grit Collector</u>**

    i. Omit page 5 from Attachment 2. Excerpt from 1962 Original Grit Collector. Drawing number is 04D10159. This is not the correct cutsheet for existing Grit Basin equipment.
    ii. Omitted Page 5 is included in this addendum as Addendum 2 Attachment 2 Excerpt from 1962 Original Grit Collector

5. **<u>FWTP Grit Basin Photos: Existing Conditions</u>**

    i. Addendum 2 FWTP Grit Basin Photos_Existing Conditions shows pictures of the facility in its current state. Basin wasn't drained during the job walk; therefore, these pictures are provided as a reference.

Attachments:

1. Addendum 2 BID ITEM DESCRIPTIONS
2. Addendum 2 Specification Section 09_ 96_01 High Performance Coatings.
3. Addendum 2 Pre-Bid Sign In Sheet 02.03.2026
4. Addendum 2 Attachment 2 Excerpt from 1962 Original Grit Collector
5. Addendum 2 FWTP Grit Basin Photos_Existing Conditions

END ADDENDUM #2

Attachment 1

BID ITEM DESCRIPTIONS

The items described below correspond to the items on the Bid Schedule. It is understood that the Contractor shall furnish all labor, equipment, materials, tools, parts, and other items necessary to complete the work as shown on the Drawings and described in the Specifications.

ITEM 1. Center Pier and Drive Cage Coating

A. Description:

The work to be performed for this item includes removing the coating from the center column surface, remove coating of drive cage, assess and replace drive cage members that have experience extensive corrosion, preparation of exterior surface for coating application (including but not limited to surface preparation and protecting surfaces/materials not to be coated), surface coating application, waste disposal, and any other related work required to complete the exterior coating of the Grit Separator Rake Arm Center Pier and Drive Cage as indicated in the Drawings and Specifications. This includes labor, furnishing of equipment, all materials as required for a complete surface preparation and coating application, ~~25-year warranty,~~ and waste disposal.

B. Measurement and Payment:

Coating areas shall be measured and paid on lump sum basis. For the bidding purposes contractor shall assume outside diameter of center pier to be 3’ 6” and 8’ 6” tall (field verification required for exact measurements). Up to 20% of the line-item price may be requested by the Contractor upon completion of the removal of the existing coating and surface preparation for the new coating. Verification of valid manufacturer’s warranty shall also be provided with the request for final payment. All Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 2. Grit Basin Cleaning

A. Description:

This item shall include all materials, tools, equipment, labor, parts and other items necessary to clean Grit Basin at required project stages. Grit Basin shall be clean of any debris caused by the demo and installation of the rake arm ~~and Drive Cage installation~~, coating of the center pier and drive cage. Aswell as the work associated with the installation of the ladder, handrail, fall protection, and any other work that generated construction debris in this area.

B. Measurement and Payment:

Grit Basin Cleaning shall be measured and paid on a lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts, and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 3. Rake Arm Replacement

A. Description:

This item includes but not be limited to removal of existing rake arms, installation of new 316 stainless steel rake arm and all associated componentry, nuts, bolts, wear shoes, adjustable flight~~, 25-year warranty~~, and any other items associated with the rake arm replacement.

The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary to remove and replace rake arm and drive cage as indicated on the Drawings and in the specifications.

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 4. Ladder and Fall Arrest System Install

A. Description:

This item includes, but not be limited to removal of old ladder system, grouting of old penetrations from the existing ladder system, anchorage calcs for new anchoring points, rebar scanning, installation of OSHA compliant fall arrest system, and installation of new 316 stainless steel ladder system including any other items associated with the ladder install. The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary for furnishing, and installing a new OSHA compliant exterior stainless steel ladder system as shown in the Drawings and described in the Specifications.

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 5. Handrail Install

A. Description:

This item includes, but not be limited to removal of section of existing handrail system, stabilizing existing handrail system that had been modified, rebar scanning for penetrations, anchoring post bases, grouting of old penetrations from the existing handrail system, rebar scanning, and installation of new handrail system including any other items associated with the handrail install. The work to be performed for this item shall include all tools, supplies, materials, equipment, and labor necessary for furnishing, and installing a new OSHA compliant exterior handrail system as shown in the Drawings and described in the Specifications

B. Measurement and Payment:

Payment shall be paid on lump sum basis. Measurement shall be based on the amount of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all materials, tools, equipment, labor, parts and other items

necessary to complete the work under this item in accordance with the Drawings and Specifications, including mobilization and demobilization costs.

ITEM 6. Warranties

A. Description:

This item shall include one (2) warranties from installer as listed:

1. 2-year warranty of work and materials for rake arm, ~~drive cage,~~ ladders, handrail, fall protection, and associated equipment.
2. 2-year warranty of work and materials for coating work of the center pier and drive cage.

Product warranties~~, including 25 year warranty on coating of drive cage and center pier~~ are expected be from manufacturer and be covered by associated installation line item.

B. Measurement and Payment:

Warranties shall be measured and paid on a lump sum basis upon completion of all work elements and acceptance by City. Measurement shall be based on the percentage of work completed as determined by the Engineer. Payment shall include full compensation for furnishing all supervision, labor, materials, tools, and equipment necessary to complete the work under this item.

END OF BID ITEMS DESCRIPTIONS

Attachment 2

SECTION 09_96_01

HIGH-PERFORMANCE COATINGS

TABLE OF CONTENTS

PART 1 GENERAL 2

1.01 SUMMARY 2
1.02 REFERENCES 2
1.03 TERMINOLOGY 4
1.04 SUBMITTALS 5
1.05 QUALITY ASSURANCE 7
1.06 DELIVERY, STORAGE, AND HANDLING 9
1.07 PROJECT CONDITIONS 10
1.08 MAINTENANCE 12
1.09 TECHNICAL REPRESENTATIVES' RESPONSIBILITIES 12

PART 2 PRODUCTS 13

2.01 DESIGN AND PERFORMANCE CRITERIA 13
2.02 COATING SYSTEMS IDENTIFICATION 13
2.03 PRODUCTS FOR COATING SYSTEMS 14

PART 3 EXECUTION 14

3.01 GENERAL PROTECTION REQUIREMENTS 14
3.02 GENERAL SURFACE PREPARATION REQUIREMENTS 15
3.03 MECHANICAL AND ELECTRICAL EQUIPMENT PREPARATION 15
3.04 CLEANING OF NEW AND PREVIOUSLY COATED OR NEW SURFACES 16
3.05 BLAST CLEANING 16
3.06 GENERAL PREPARATION REQUIREMENTS FOR METALLIC SURFACES 17
3.07 PREPARATION REQUIREMENTS BY SURFACE TYPE 18
3.08 APPLICATION REQUIREMENTS 19
3.09 COATING SYSTEMS 22
3.10 SURFACES NOT REQUIRING COATING 23
3.11 QUALITY CONTROL 23
3.12 CORRECTIVE MEASURES 24
3.13 CLEANUP 25
3.14 FINAL INSPECTION 25

ATTACHMENT A – SCHEDULE OF SURFACES TO BE COATED

ATTACHMENT B – COATING DETAIL SHEET

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Coatings, including coating systems, surface preparation, application requirements, and quality control requirements.

1.02 REFERENCES

A. Abbreviations:
   1. CMU – Concrete masonry units.
   2. CSA – Coating system applicator. Specialty subcontractor retained by the Contractor to perform surface repairs, surface preparations, and apply coating systems as specified in this Section.
   3. CSM – Coating system manufacturer.
   4. CTR – Coating system manufacturer's technical representative.
   5. DFT – Dry-film thickness. Thickness of cured film, usually expressed in mils (0.001 inch).
   6. VOC – Volatile organic compound. The portion of the coating that is a compound of carbon, is photochemically reactive, and evaporates during drying or curing; expressed in grams per liter (g/l) or pounds per gallon (lb/gal). VOC is determined by EPA Method 24.
   7. WFT – Wet film thickness. Coating thickness as measured immediately after application. Usually expressed in mils (0.001 inch).

B. Standards:
   1. ASTM International (ASTM):
      a. A380 – Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
      b. A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
      c. D16 – Standard Terminology for Paint, Related Coatings, Materials, and Applications.
      d. D2200 – Standard Practice for Use of Pictorial Surface Preparation Standards and Guides for Painting Steel Surfaces.
      e. D3359 – Standard Test Methods for Rating Adhesion by Tape Test.
      f. D3960 – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
      g. D4262 – Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
      h. D4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
      i. D4285 – Standard Test Method for Indicating Oil or Water in Compressed Air.
      j. D4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
      k. D4417 – Standard Test Methods for Field Measurement of Surface Profile of Blast-Cleaned Steel.
      l. D4787 – Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

m. D5162 – Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates.
n. D7234 – Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
o. E337 – Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures).
p. F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
q. F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-situ Probes.

2. International Concrete Repair Institute (ICRI):
   a. 310.2 – Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.
3. NACE International (NACE):
   a. SP0178 – Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
   b. SP0188 – Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
4. National Association of Pipe Fabricators (NAPF):
   a. 500-03 – Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings.
5. NSF International (NSF):
   a. 61 – Drinking Water System Components – Health Effects.
   b. 600 – Health Effects Evaluation and Criteria For Chemicals In Drinking Water.
6. Occupational Safety and Health Administration (OSHA).
7. Society for Protective Coatings (SSPC):
   a. Glossary – SSPC Protective Coatings Glossary.
   b. Guide 6 – Guide for Containing Surface Preparation Debris Generated during Paint Removal Operations.
   c. PA 1 – Shop, Field, and Maintenance Painting of Steel.
   d. PA 2 – Procedure for Determining Conformance to Dry Coating Thickness Requirements.
   e. PA 9 – Measurement of Dry Coating Thickness Using Ultrasonic Gages.
   f. QP 1 – Field Application of Coatings to Complex Industrial and Marine Structures.
   g. QP 3 – Shop Application of Complex Protective Coating Systems.
   h. SP 1 – Solvent Cleaning.
   i. SP 2 – Hand Tool Cleaning.
   j. SP 3 – Power Tool Cleaning.
   k. SP 5 – White Metal Blast Cleaning.
   l. SP 7 – Brush-Off Blast Cleaning.
   m. SP 10 – Near-White Metal Blast Cleaning.
   n. SP 11 – Power Tools Cleaning to Bare Metal.
   o. SP 13 – Surface Preparation of Concrete.
   p. SP 16 – Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
   q. SP VIS 1 – Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.

1.03 TERMINOLOGY

A. Definitions used in this Section are in accordance with definitions referenced in ASTM D16, ASTM D3960, and SSPC Glossary of Definitions.

B. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section, have the indicated meaning.
   1. Abrasive: Material used for blast cleaning, such as sand, grit, or shot.
   2. Abrasive blast cleaning: Cleaning/surface preparation by abrasive propelled at high speed.
   3. Anchor pattern: Profile or texture of prepared surface(s).
   4. Biogenic sulfide corrosion: Corrosion caused by sulfuric acid formed when *Thiobacillus* bacteria metabolizes hydrogen sulfide.
   5. Bug holes: Small cavities resulting when air bubbles are entrapped in the surface of formed concrete during placement and consolidation.
   6. Dew point: Temperature a given air/water vapor mixture starts to condense.
   7. Dry to recoat: Time interval between material application and its ability to receive the next coat.
   8. Dry to touch: Time interval between material application and its ability to tolerate a light touch without coating damage.
   9. Drying time: Time interval between application and material curing.
   10. Exposed surface: Any indoor or outdoor surface not buried or encased.
   11. Feather edging: Reducing coating thickness at its edge to blend with existing surrounding coating.
   12. Ferrous: Cast iron, ductile iron, wrought iron, and all steel alloys, except stainless steel.
   13. Field coat: Application of a surface coating system at the work site.
   14. Finish coat: Final coat in a paint system, including texture, color, smoothness of surface, and other properties affecting appearance.
   15. Hold point: A defined point, specified in this Section, at which Work shall be halted for inspection.
   16. Holiday: A discontinuity, skip, void, or pinhole in coating or coating system film that exposes the substrate.
   17. Honeycomb: Segregated and porous surface of hardened concrete due to insufficient consolidation.
   18. Hydroblast: High or ultra-high-pressure water jet surface preparation.
   19. Immersed/Immersion: A service condition in which substrate is submerged, is immediately above liquids, or is subject to frequent wetting, splashing, or washdown.
   20. Incompatibility: One coating's inability to overlay another coating or surface as evidenced by bleeding, poor bonding, or lifting of old coating; inability of a coating to bond to a substrate.
   21. Laitance: A thin, weak, brittle layer of cement and aggregate fines on a concrete surface.
   22. Mil: 0.001 inch.
   23. Overspray: Dry spray, particularly paint bonded to an unintended surface.
   24. Pinhole: A small diameter discontinuity in a coating or coating system film, created by off gassing from a void in a concrete or masonry substrate causing a void between coats or exposing the substrate. Usually caused by coating application while temperature is rising.

25. Pot life: Time interval after components are mixed and coating can be satisfactorily applied.
26. Prime coat: First full paint coat applied to a surface when using a multicoat system. Primers adhere to a new substrate, protect the substrate, and promote adhesion of subsequent coats of paint. The prime coat on metal surfaces is the first full coat and does not include solvent wash, grease emulsifiers, or other pretreatment applications.
27. Resurfacer/Resurfacing material: A layer of cementitious and/or resin-based material used to fill or otherwise restore surface continuity to worn or damaged concrete surfaces.
28. Shop coat: One or more coats applied in an off-site shop or plant before shipment to work site where field or finishing coat(s) are applied.
29. Stripe coat: A separate brush coat of paint applied to all weld seams, pits, nuts/bolts/washers, and edges. This coat shall not be applied until the previous coats have cured. Once applied, the coat shall be allowed to cure before subsequent coats are applied.
30. System: Protective film with one or more coats applied in a predetermined order, including surface preparation and quality control requirements.
31. Thick film coating system: A coating system applied with a minimum dry film thickness of 25 mils.
32. Touch-up painting: Application of paint on previously painted surfaces to repair marks, scratches, and deteriorated or damaged areas to restore the appearance and performance of the coating.
33. Water blast: An alternative to air abrasive blast cleaning that can be used with or without abrasive injection. Water cleaning at pressures up to 5,000 pounds per square inch is called low-pressure water cleaning or power washing. High-pressure water cleaning uses water pressures between 5,000 and 10,000 pounds per square inch. Water jetting is water blasting with added abrasive at pressures between 10,000 and 25,000 pounds per square inch. Ultra-high-pressure water jetting is water blasting at pressures above 25,000 pounds per square inch.
34. Weld splatter: Beads of non-structural weld metal that adhere to the surrounding surface, removed as part of surface preparation.

1.04 SUBMITTALS

A. As specified in Submittal Procedures, submit the following:
   1. Schedule of proposed coating materials.
   2. Schedule of surfaces to be coated with each coating material.
   3. Dehumidification and heating plan.
   4. Methods for tenting blasting areas and methods to protect existing equipment from dust and debris.
   5. Abrasives and abrasive blast cleaning disposal.
   6. Product data, application, and safety data sheets.
   7. NSF certification of coatings for potable water supply systems, including NSF 600 and/or NSF 61.
   8. Compliance with regulatory requirements:
      a. VOC limitations.
      b. Hazardous lead compounds and polychlorinated biphenyls (removal and disposal methods).
   9. Manufacturer’s standard color samples.

10. Include 8-inch square drawdowns or brushouts of topcoat finish when requested. Identify each sample as to finish, formula, color name and number, sheen name, and gloss units.
11. Affidavits signed by an officer of the CSM's corporation attesting to full compliance of each coating system component with current federal, state, and local air pollution control regulations and requirements.
12. Thick film coating systems (greater than 25 mils):
    a. CSM's detailed written instructions for coating system treatment and graphic details for coating system terminations in coated structures, including pipe penetrations, metal embedments, gate frames, and other terminations encountered.
13. Quality assurance Submittals:
    a. Quality assurance plan.
    b. Qualifications:
        1) Field coating applicator includes:
            a) Provide a minimum of 5 project references where similar coating work has been performed by the company in the past 5 years:
                (1) Name and address of project.
                (2) Year of installation.
                (3) Year placed in operation.
                (4) Point of contact: Name and phone number.
            b) SSPC-QP 1 certified as required.
        2) Shop coating applicator includes:
            a) Provide a minimum of 5 project references where similar coating work has been performed by the company in the past 5 years:
                (1) Name and address of project.
                (2) Year of installation.
                (3) Year placed in operation.
                (4) Point of contact: Name and phone number.
            b) SSPC-QP 3 certified as required.
    c. Field Quality Control:
        1) Provide certification letters from NACE Certified Level 3 Coating Inspector for surface preparation and coating application conformance with these specifications for any field-applied procedures performed as may be applicable to the Project.
        2) Indicate results of applicators furnished tests and inspections, including, but not limited to, ambient environmental conditions, surface cleanliness, surface profile, DFT measurements, holiday testing, etc.
    d. CSA reports:
            a) Written daily quality control inspection reports.
            b) Reports to observe and approve surface preparation of structures to be coated.
            c) Reports to observe and approve coating application procedures.
            d) Reports on visits to plants to observe and approve surface preparation and coating application on shop-coated items.
14. For each substituted coating material "equal" to specified product in the coating tabulation:
    a. List of not less than 5 similar successful material applications:
        1) Project name, location, type of structure, and application dates.
        2) Owner's name, address, and telephone number.

b. Certification that material meets or exceeds specified requirements:
   1) Manufacturer's certification, including technical representative's signature and date of signature.
   2) Independent laboratory's certified test reports.

1.05 QUALITY ASSURANCE

A. Coating inspector:
   1. CSA inspector and/or third-party inspector shall be trained and knowledgeable in the specified coating's application.
   2. Provide calibrated inspection instruments and demonstrate use as required.
   3. Applicator's quality assurance inspector foreman shall oversee all aspects of coating work and shall be NACE Level III certified or an SSPC Protective Coatings Inspector (PCI).
      a. Oversees lesser qualified inspectors and provides them training and guidance for testing and report preparations, provides documentation for all inspection equipment showing calibrations, and verifies the equipment is free from damage and is in proper working condition.

B. Regulatory requirements: Comply with governing agencies' regulations by using coatings in accordance with their VOC limits.
   1. Lead-based coatings are not permitted.
   2. Do not use coal-tar epoxy in contact with drinking water or exposed to ultraviolet radiation.

C. Pre-installation conference:
   1. Coordinate Hold Point schedule.

D. Field samples:
   ~~1. Prepare and coat a minimum 100-square-foot area of each system between corners or limits such as control or construction joints.~~
   ~~2. Approved field sample may be part of the Work.~~
   1. During the coating application, samples of each coating system shall be submitted on a 3-inch by 3-inch steel sample. Each sample shall be completely coated at the specified thickness over one 3-inch by 3-inch surface with the applicable coating system. Samples shall be labeled with the coating type, surface preparation method, application method, and dry film thickness.
   2. The manufacturer's standard details for coating over beams, pipe penetrations, and concrete edge terminations shall be provided.

E. Obtain approval before coating other surfaces. Use products by the same manufacturer for prime coats, intermediate coats, and finish coats on same surface, unless specified otherwise. Coatings must be compatible with one another and complete a cohesive coating system.

F. CSM services:
   1. CSA shall arrange for CTR to attend pre-installation conferences.
   2. Visit the Project Site periodically to consult on and inspect specified surface preparation and application Hold Points.
   3. Visit coating plants to observe and approve surface preparation procedures and coating application of items to be shop primed and coated.
   4. CTR shall provide written inspection reports.

G. Quality control requirements:
   1. Applicator shall be responsible for the workmanship and quality of the coating system installation.
      a. Inspections by the Owner, Engineer, or CTR will not relieve or limit the CSA's responsibilities.
   2. In accordance with this Specification's requirements and the standards referenced in this Section. Changes in the coating system application requirements will be allowed only with the Engineer's written acceptance.
   3. Specially trained crews with experience applying the specified coating system coating are required for:
      a. Coating application using plural component spray equipment or other specialty equipment.
      b. Coating with specialty linings for severe service conditions, including floor coatings, and with linings for corrosive headspaces or secondary containment areas.
   4. CTR shall specially train personnel for coating systems as specified in Attachment B – Coating Detail Sheets.
      a. CSM shall approve personnel in writing applying the coating system.
   5. Do not use contaminated, outdated, diluted materials, and/or materials from previously opened containers.
   6. Identify inspection access points used by the Owner's or Engineer's personnel.
   7. Provide ventilation, ingress, egress, or other means as necessary for the Owner's or Engineer's personnel to safely access the work areas.
   8. Conduct and continually inspect Work so the coating system is installed as specified. CSM shall provide written directions to correct coating work not in accordance with the specifications or is otherwise unacceptable.
   9. Provide written daily reports summarizing test data, work progress, surfaces covered, ambient conditions, quality control inspection test findings, and other information pertinent to the coating system application.
      a. Determine relative humidity in accordance with ASTM E337. Confirm other conditions, such as proper protective measures for surfaces not to be coated and safety requirements for personnel.
         1) Measure daily at the shift's beginning and end and at intervals not to exceed 4 hours during the shift.
         2) Determine the acceptability of weather and/or environmental conditions within the structure in accordance with the CSM's requirements.
      b. Monitoring surface preparation: Spot check cleanliness, surface profile, and surface pH testing at least 3 times daily. Check each surface at least once. In accordance with:
         1) ASTM D4262.
         2) ASTM D4263.
         3) ASTM D4417.
         4) ICRI 310.2 requirements.
         5) SSPC surface preparation standards.
      c. Confirm that compressed air used for surface preparation or blow-down cleaning is free of oil and moisture.
      d. Monitor surface preparation daily at the shift's beginning and end and at intervals not to exceed 4 hours during the shift.
      e. Do not apply coatings when environmental conditions are outside of the CSM's published limits.

f. Monitoring coatings application: Continuously inspect, measure, and record the wet film thickness and general film quality (visual inspection) for runs, sags, pinholes, holidays, etc., during coating.
   1) Perform WFT measurements in accordance with ASTM D4414.

g. Post cure evaluation: Measure and inspect the overall dry film thickness on all surfaces.
   1) Conduct a DFT survey and perform adhesion testing, holiday detection, or cure testing as specified in this Section and/or the CSM's written instructions.
   2) Perform applicable tests in accordance with ASTM D4541, ASTM D4787, ASTM D5162, ASTM D7234, SSPC-PA 1, SSPC-PA 2, SSPC-PA 9, and other pertinent standards and recommended practices.

H. Inspection at Hold Points:
   1. Conduct inspections at Hold Points during the coating system application and record the results.
   2. Coordinate Hold Points with the Engineer so the Engineer can observe the Contractor's inspections on a scheduled basis.
   3. Provide the Engineer with a minimum of 24 hours of notice before conducting Hold Point inspections.
   4. Hold Points shall be as follows:
      a. Conditions before surface preparation: Before starting surface preparation, observe, record, and confirm that oil, grease, and/or soluble salts are gone from the surface.
      b. Post surface preparation: After completing surface preparation, measure and inspect for cleanliness and proper surface profile as specified in this Section and in the CSM's written instructions.
      c. Coatings application: At the beginning of any coating system application, measure, record, and confirm acceptability of surface and ambient air temperature and humidity. Inspect applicator's equipment for serviceability and suitability for coatings application.

      d. Coatings application: At the beginning of coating system application, measure, record, and confirm acceptability of surface and ambient air temperature and humidity. Inspect applicator's equipment for serviceability and suitability for coatings application.
         1) Observe conditions during the pre-application meeting.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Immediately remove unspecified and unapproved coatings from the Project Site.

B. Deliver new, labeled, unopened containers:
   1. Do not deliver materials after the manufacturer's expiration date or over 12 months from manufacturing date, whichever is more stringent. Store materials in well-ventilated enclosed structures and protect from weather and excessive heat or cold in accordance with the CSM's recommendations.
      a. Store flammable materials in accordance with federal, state, and local requirements.

b. Store rags and cleanup materials appropriately to prevent fire and spontaneous combustion.

2. Store and dispose of hazardous waste in accordance with federal, state, and local requirements. This requirement specifically applies to waste solvents and coatings.

3. Container labels shall show the following:
   a. Brand name or product title.
   b. CSM's batch number.
   c. CSM's manufacture date.
   d. CSM's name.
   e. Generic material type.
   f. Application and mixing instructions.
   g. Hazardous material identification label.
   h. Shelf-life expiration date.
   i. Color.
   j. Mixing and reducing instructions.

4. Clearly mark containers to indicate safety hazards associated with the use of or exposure to materials.

1.07 PROJECT CONDITIONS

A. Apply coatings to dry surfaces.
   1. Surface moisture: In accordance with the manufacturer's requirements or as specified in this Section.

B. Do not apply coatings when the following conditions exist. If such conditions exist, provide containment, covers, environmental controls, and other necessary measures.
   1. During rainy, misty, or damp weather, or to surfaces with frost or condensation.
   2. When the surface temperature is below 10 degrees Fahrenheit above the dew point.
   3. When ambient or surface temperature:
      a. Is less than 55 degrees Fahrenheit unless the manufacturer allows a lower temperature.
      b. Is less than 65 degrees Fahrenheit for clear finishes unless the manufacturer allows a lower temperature.
      c. Exceeds 90 degrees Fahrenheit unless the manufacturer allows a higher temperature.
      d. Exceeds the manufacturer's recommendation.
   4. When relative humidity is higher than 85 percent.
   5. Under dusty or adverse environmental conditions.
   6. When light on surfaces measures less than 15-foot candles.
   7. When wind speed exceeds 15 miles per hour.

C. Apply coating only under evaporation conditions rather than condensation.
   1. Use dehumidification equipment, fans, and/or heaters inside enclosed areas to maintain required atmospheric and surface temperature requirements for proper coating application and cure.
   2. Measure and record relative humidity and air and surface temperatures at the start and end of each shift to confirm proper humidity and temperature levels inside the work area.
      a. Submit test results.

D. Continuously ventilate, dehumidify, and heat enclosed spaces with high humidity during surface preparation, coating application, and curing.
   1. Maintain minimum air temperature of 55 degrees Fahrenheit and 10 degrees Fahrenheit above the dew point.
   2. Maintain dew point of at least 10 degrees Fahrenheit less than the temperature of the coldest part of the structure where work is performed.
   3. Reduce dew point temperature in conditioned space by at least 10 degrees Fahrenheit within 20 minutes.
   4. Seal work areas and maintain positive pressure in accordance with the dehumidification equipment supplier's recommendations.
   5. Maintain these conditions before, during, and after application to ensure proper adhesion and cure of coatings for no less than:
      a. Entire curing period.
      b. 8 hours after coating.

E. Systems:
   1. Internal combustion engine generators may be used.
      a. Obtain required permits and provide air pollution and noise control devices on equipment as required by permitting agencies require.
      b. Comply with state, federal, and local fire and explosion protection measures when locating and operating generators.
      c. Locate engine generator outside hazardous classified areas in accordance with NFPA 820.
      d. Provide daily fuel service for generators for duration of use.
   2. Dehumidification:
      a. Provide desiccant or refrigeration drying.
      b. Use only desiccant types with a rotary desiccant wheel capable of continuous operation.
      c. Liquid, granular, or loose lithium chloride drying systems are not acceptable.
   3. Heating:
      a. Use electric, indirect combustion, or steam coil.
      b. Direct-fired combustion heaters are not acceptable heat sources during abrasive blasting, coating application, or coating cure.
   4. Filters:
      a. Use a filtration system for dust removal designed to not interfere with the dehumidification equipment's ability to control dew point and relative humidity inside the reservoir.
      b. Do not allow air from the working area or dust filtration equipment to recirculate through thein dehumidifier during coating application or when solvent vapors are present.
   5. Design and Submittals:
      a. Prepare and submit dehumidification and heating plan, including all equipment, and operating procedures.
      b. Suppliers of services and equipment shall have at least 3 years of experience in similar applications.

F. Provide containment and ventilation system components in accordance with SSPC-Guide 6, Level 3, and as required for hazardous materials.

1.08 MAINTENANCE

A. Provide extra materials:
   1. Minimum 1 gallon of each type and color of coating applied or provide additional quantities if specified in the Contract Documents:
      a. Deliver unopened factory-labeled cans when the manufacturer packages material in gallon cans.
      b. Deliver material in new gallon containers, properly sealed and identified with permanently affixed, durable, printed labels indicating brand, type, and color, when the manufacturer does not package material in gallon cans.

~~## 1.09 TECHNICAL REPRESENTATIVES' RESPONSIBILITIES~~

~~A. General:~~
   ~~1. Attend pre-installation conference.~~
   ~~2. Perform on-site application training.~~

~~B. Coating system installation training:~~
   ~~1. Provide a minimum of 8 hours of classroom and off-site training for application personnel and supervisory personnel in one of the following ways:~~
      ~~a. Train a minimum of 2 supervisory personnel and 2 application personnel.~~
      ~~b. Submit a letter from the CSM stating that CSM approves the supervisory and application personnel, listed by name and responsibility, and no additional training is required.~~
   ~~2. CTR can train up to 14 application personnel and 3 supervisory personnel at a time.~~
   ~~3. Minimum training requirements:~~
      ~~a. Explain in detail the mixing, application, curing, and termination requirements.~~
      ~~b. Provide hands-on demonstration of coating system mixing.~~
      ~~c. Explain in detail the ambient condition requirements for temperature and humidity.~~
      ~~d. Explain in detail the surface preparation requirements.~~
      ~~e. Explain in detail the re-coat times, cure times, and related ambient condition requirements.~~
      ~~f. Write a letter stating that training was satisfactorily completed by the personnel, listed by name and responsibility.~~
   ~~4. Provide special training as specified in the coating detail sheets.~~
   ~~5. Visit the Site at the following intervals:~~
      ~~a. On the first day of application of any coating system.~~
      ~~b. As necessary during surface preparation and application to ensure installations are made in accordance with the manufacturer's recommendations.~~
      ~~c. As required to resolve field problems attributed to or associated with the manufacturer's products.~~
   ~~6. Routinely inspect and verify in writing that application personnel have successfully performed surface preparation, filler/surfacer application, coating~~

~~system application, and quality control inspection in accordance with this Section and to warrantable quality.~~

~~a. Be on site to periodically observe and oversee:~~

~~1) Coating application.~~

~~2) End of surface preparation.~~

~~3) During coating application.~~

~~4) Post-cure inspection.~~

~~7. Conduct final review of completed coating system installation and submit detailed report to the Owner.~~

1.09 MANUFACTURER'S PARTICIPATION

A. The Contractor shall require the coating manufacturers to furnish the following services:

1. The manufacturer's representative shall provide on-site technical support, on an as-needed basis, to resolve field problems associated with the manufacturer's products furnished under this Contract or the application thereof throughout the duration of the Work.

2. The coating manufacturer's representative shall be present during the final inspection of the finished coating by the Inspector for the tank.

3. Submit manufacturer's certifications that materials have been approved for the installation conditions shown on the Drawings and as specified herein.

4. Submit manufacturer's Materials Warranty Certificate.

1.10 WARRANTY

A. The Contractor and coating manufacturers shall warrant the coating system applications against defects and workmanship after final acceptance of the Work for a period of 2 years. The Contractor shall perform all Work and supply all equipment and materials associated with the repair of failures identified in the warranty inspection at no cost to the City.

B. The coating manufacturer shall warrant for a period of 2 years that its products meet published physical properties and that they are free of manufacturing defects.

C. The coating manufacturer shall replace any defective product and the Contractor shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during the warranty period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the City.

1.11 WARRANTY INSPECTION

A. Warranty inspections shall be conducted in the last warranty year following Work acceptance. All coating applications found deficient or defective during the warranty period shall be repaired or replaced by the Contractor, to the satisfaction of the City. These repairs or replacements shall be in accordance with this Specification and the material manufacturer's recommendations at no cost to the City. Deficient or defective areas in the coatings include blisters, bubbling, sticky surfaces, peeling, disbondment, or cracking. The Final Inspection shall be used to assist in determining deficient or defective areas in the coating systems.

The City shall establish a date for the inspection and provide 30 days' advance notification to the Contractor, so the Contractor and a coating manufacturer representative can be present during the inspection. The City shall pay for the operational procedures needed to lockout/tagout, dewater, and provide access to the tank. The Contractor shall arrange for and cover all costs for repair Work under the warranty.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Coating materials shall be formulated for environments encountered in water and wastewater treatment processes.

B. Coating materials that encounter water distributed as potable water shall be certified in accordance with NSF 61.

2.02 COATING SYSTEMS IDENTIFICATION

A. Naming conventions: Coating systems identifications contain the elements defined in Table 1.

Table 1. Coating System Identification Elements

First Element	**-**	**Second Element**	**-**	**Third Element**	**-**	**Fourth Element (optional)**
3 or 4 alpha characters		1-3 alpha characters		1 number		3 or 4 alpha characters
Coating Type		Substrate		System Number		Additional Substrate or Special Condition
Example: EPX	-	C	-	6	-	BSC

1. First element identifies the coating type using the following abbreviations:
   a. ACR: Acrylic.
   b. CTE: Coal tar epoxy.
   c. ELA: Elastomeric acrylic.
   d. EPU: Epoxy-polyurethane.
   e. EPX: Epoxy.
   f. POL: Polyurethane.
   g. SIL: Silicone.
   h. SILX: Siloxane or silane.
   i. VE: Vinyl ester.
2. Second element identifies the substrate using the following abbreviations:
   a. C: Concrete or masonry.
   b. F: Concrete flooring.
   c. FRP: Fiber-reinforced plastic.
   d. GM: Galvanized metal.
   e. M: Metal.

f. PVC: Polyvinyl chloride, chlorinated polyvinyl chloride.

3. Third element identifies the sequential system number.
   a. For example, EPX-C-2 is the second standard epoxy coating system for concrete substrates.
4. Fourth element is optional and identifies the additional substrate or special condition with the following abbreviations:
   a. BG: Below grade or buried.
   b. BSC: Biogenic sulfide corrosion-resistant applications in wastewater.
   c. OZ: Organic zinc primer, epoxy polyurethane system.
   d. PWS: Potable water service applications (NSF-61 approved).
   e. SC: Secondary containment.

2.03 PRODUCTS FOR COATING SYSTEMS

A. Products: As specified in Attachment B – Coating Detail Sheets.

B. Cleaning solvents:
   1. Requirements for solvent wash, solvent wipe, or cleaner used, including, but not limited to, those used for surface preparation in accordance with SSPC-SP 1.
   2. Use clean white cloths and clean fluids in solvent cleaning.

PART 3 EXECUTION

3.01 GENERAL PROTECTION REQUIREMENTS

A. Protect adjacent surfaces from coatings and damage associated with coating work and repair any damage that occurs.

B. Place coating waste, cloths, and material that may pose a fire hazard in closed metal containers and remove daily from the Site.

C. Remove electrical plates, surface hardware, fittings, and fasteners before coating application.
   1. Carefully store, clean, and replace items after completing coating in each area.
   2. Do not use solvent or degreasers to clean hardware that may remove permanent lacquer finishes.

D. Erect and maintain protective enclosures in accordance with SSPC-Guide 6.

E. Protect the following surfaces from abrasive blasting by masking or by other means:
   1. Threaded portions of valve and gate stems, grease fittings, and identification plates.
   2. Machined surfaces for sliding contact.
   3. Surfaces to be assembled against gaskets.
   4. Surfaces of shafting where sprockets will be fit.
   5. Surfaces of shafting where bearings will be fit.
   6. Machined bronze surfaces, including slide gates.
   7. Cadmium-plated items, except cadmium-plated, zinc-plated, or sherardized fasteners used to assemble equipment requiring abrasive blasting.

8. Galvanized items, unless scheduled to be coated.

3.02 GENERAL SURFACE PREPARATION REQUIREMENTS

A. Prepare surfaces in accordance with coating detail sheets in Attachment B – Coating Detail Sheets.
   1. Include coating and surface preparation requirements.
   2. CSM's instructions will also have surface preparation requirements but follow the more stringent if information conflicts.

B. Where required by the Owner's representative, a NACE International certified coatings inspector, provided by the Owner, will inspect and approve surfaces to be coated before applying a coating.
   1. Applicator shall coordinate coating inspections.
      a. Identify coating inspection Hold Points during the pre-installation conference.
      b. Provide at least 2 days' notice before inspection.
   2. Correct surface defects identified by the inspector at no additional cost to the Owner.

3.03 MECHANICAL AND ELECTRICAL EQUIPMENT PREPARATION

A. Remove grilles, covers, and access panels for mechanical and electrical system and coat separately.

B. Prepare and finish coat equipment primed by the manufacturer using specified intermediate and topcoats, as applicable, and color selected by the Owner.

C. Prepare, prime, and coat both insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars, and supports, except where items are covered with material not requiring coating, or with a prefinished coating.

D. Replace identification markings on mechanical or electrical equipment when coated over or spattered.

E. Prepare and coat dampers exposed immediately behind louvers, grilles, and convector and baseboard heating cabinets to match face panels.

F. Prepare and coat exposed conduit and appurtenances occurring in finished areas with color and texture to match adjacent surfaces.

G. Prepare and coat sides, front, back, and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

H. Color code equipment, piping, conduit, and exposed ductwork and apply color banding and identification, such as flow arrows, naming, and numbering, in accordance with the Contract Documents.

3.04 CLEANING OF NEW AND PREVIOUSLY COATED OR NEW SURFACES

A. Utilize cleaning agent to remove soluble salts, such as chlorides, from concrete and metal surfaces:
   1. Cleaning agent: Biodegradable non-flammable and containing no VOC.
   2. Manufacturers: The following or equal:
      a. CHLOR*RID International, Inc.
         1) Complete soluble salt removal with steam or warm water cleaning.
   3. Steam clean and degrease surfaces to be coated to remove oils and grease.
   4. Test cleaned surfaces to ensure removal of soluble salts. Carry out additional cleaning as needed.
   5. Complete final surface preparation before applying the new coating system in accordance with the manufacturers printed instructions.

3.05 BLAST CLEANING

A. Surface preparation requirements:
   1. Do not reuse spent blast abrasive.
   2. Ensure that filter compressed air used for blast cleaning is free of condensed water and oil.
      a. Clean moisture traps at least once every 4 hours or more frequently, as required, to prevent moisture from entering the abrasive blasting equipment air supply.
      b. Check blast air for moisture and oil after each cleaning in accordance with ASTM D4285.
   3. Install oil separators just downstream of compressor discharge valves and at the discharge point of blast pot discharges. Check separators on the same frequency as the moisture traps.
   4. Keep regulators, gauges, filters, and separators on compressor air lines connected always when blasting nozzles operational.
   5. Install an air dryer or desiccant filter drying unit to dry the compressed air before blast pot connections. Use and maintain the dryer throughout surface preparation work.
   6. Use a venturi-type, or other high velocity-type, abrasive blast nozzles supplied with at least 100 pounds per square inch gauge air pressure at the nozzle and enough volume to obtain appropriate blast cleaning production rates and surface cleanliness.
   7. Provide airborne particulate evacuation and filtering that meets OSHA safety standards. Maintain optimal visibility both to clean and provide the specified surface profile and to allow inspection of the substrate during surface preparation work.
   8. Surfaces blasted and prepared and not coated/painted the same day shall be re-prepared prior to coating/painting. Any rust-back occurring before coating shall be removed.
   9. Prepared blasted surfaces may be open longer if dehumidification (DH) is used to reduce moisture vapor and eliminate the potential for rust-back.

3.06 GENERAL PREPARATION REQUIREMENTS FOR METALLIC SURFACES

A. Remove rust, scale, and welding slag and spatter.
   1. Remove and grind smooth excessive weld material and weld spatter on metal surfaces before blast cleaning in accordance with NACE SP0178.
   2. Grind sharp edges on metal substrate to approximately 1/16-inch radius before abrasive blast cleaning.

B. Prepare metallic surfaces in accordance with applicable portions of surface preparation specifications of the SSPC specified for each coating system.
   1. Remove grease and oil in accordance with SSPC-SP 1.
   2. Measure profile depth of the surface to be coated in accordance with Method C of ASTM D4417. Select blast particle size and gradation to produce the specified surface profile.
   3. Constantly monitor and maintain ambient environmental conditions to ensure cleanliness and that no “rust back” occurs before coating material application.
   4. Surfaces not coated the same day they are prepared shall be re-prepared prior to coating unless approved moisture control equipment is used and approved by the Owners representative.

C. Prepare metallic surfaces by blast cleaning in accordance with SSPC-VIS 1 (ASTM D2200). Prepare abrasive blast representative areas for the Owner’s representative to inspect on the first day of cleaning.

D. Unless otherwise specified, the requirements for blast cleaning steel, ductile iron, and stainless-steel substrates are as follows:
   1. Ferrous metal surfaces not to be submerged: Abrasive blast in accordance with SSPC-SP 10 unless blasting may damage adjacent surfaces, is prohibited, or is specified otherwise. Where abrasive blasting is not possible, clean surfaces to bare metal with power tools in accordance with SSPC-SP 11.
   2. Ferrous metal surfaces to be submerged: Abrasive blast in accordance with SSPC-SP 5, unless specified otherwise, to clean and provide roughened surface profile with a depth between 2 and 4 mils.
   3. Remove traces of grit, dust, dirt, rust scale, friable material, loose corrosion products, or embedded abrasive from substrate before coating application.
   4. When abrasive blasted surfaces rust or discolor before coating, abrasive blast clean surfaces again.

E. Field preparation of shop-primed surfaces:
   1. Smooth welds and prominences with power tools before applying field-applied coatings.
   2. Clean and dry shop-primed ferrous metal surfaces and fabricated assemblies before applying field coats.
   3. Prepare shop epoxy primed surfaces with light abrasive blasting or abrading and then vacuum before applying finish coats.
      a. Follow CSM instructions for surface preparation when the primer recoat limit has been exceeded.
   4. Non-immersion service: Clean in accordance with SSPC-SP 2 or SSPC-SP 3 and uniformly roughen.
   5. Immersion, BSC, and SC service: Remove shop primer in accordance with SSPC-SP 5.

F. Damaged shop primer or rust bleeding:
   1. Ferrous metals: Clean in accordance with SSPC-SP 1 and spot blast in accordance with SSPC-SP 10 to achieve a uniform surface profile between 2.0 and 2.5 mils before recoating.
   2. Reject galvanized steel with rust bleeding.

G. Damaged coating: Repair by abrasive blast cleaning surfaces as specified for the coating system; feather to a smooth transition before touching up.

3.07 PREPARATION REQUIREMENTS BY SURFACE TYPE

A. Steel and ferrous metal surfaces that require coating:
   1. Degrease or solvent clean (SSPC-SP 1).
   2. Abrasive blast surfaces to a SSPC-SP 10 for non-immersion and a SSPC-SP 5 for immersion.
      a. If abrasive blast cannot be performed, abrade in accordance with SSPC-SP 7.

B. Galvanized steel and non-ferrous metal surfaces:
   1. Degrease or solvent clean (SSPC-SP 1) to remove oily residue.
   2. Abrasive blast clean in accordance with SSPC-SP 16.
      a. If abrasive blast cannot be performed, abrade in accordance with SSPC-SP 3.
   3. Apply metal pretreatment within 24 hours before coating galvanized surfaces that cannot be thoroughly abraded, such as bolts, nuts, or preformed channels.
   4. Test surface for contaminants using copper sulfate solution.

C. Stainless-steel surfaces:
   1. Abrasive blast clean in accordance with SSPC-SP 16 to leave a clean, uniform appearance with surface profile between 1.5 and 2.5 mils.

D. Ductile iron pipe and fittings to be lined or coated: Abrasive blast clean in accordance with NAPF 500-03.

E. Sherardized, aluminum, copper, and bronze surfaces:
   1. Abrasive blast clean in accordance with SSPC-SP 16.
   2. Prepare in accordance with the CSM's instructions.

F. Cadmium-plated, zinc-plated, or sherardized fasteners:
   1. Abrasive blast in the same manner as uncoated metal when assembling equipment designated for abrasive blasting.

G. PVC and FRP surfaces:
   1. Lightly sand surfaces to be coated.
      a. Sand to remove gloss and establish uniform surface profile.
   2. Vacuum to remove loose dust, dirt, and other materials.
   3. Solvent clean with clean white rags and allow solvent to evaporate completely before applying coating materials.

3.08 APPLICATION REQUIREMENTS

A. Apply coatings in accordance with the manufacturer's instructions.

B. Empty aboveground piping to be coated of contents when applying coatings.

C. Items to be coated: Commercial or manufactured items with a factory or shop-applied coating system.
   1. Factory or shop-applied permanent coating system:
      a. Commercial components shall be coated with the manufacturer's standard surface preparation and applied permanent coating system:
         1) Pumps and valves: Shop coat with the manufacturer's highest quality coating system in accordance with the Project Specifications.
         2) Non-immersed equipment: Touch up shop primer, and coat in the field with specified coating system after installation.
         3) Immersed equipment with shop primer: Touch up shop primer and coat in the field with specified coating system after installation.
   2. Items subject to sunlight shall be topcoated with ultraviolet (UV) stable materials.
   3. Permanent coating system shall have a 10-year corrosion-free protection without significant defects stored in atmospheric exposure.
   4. Color and gloss: Manufacturer's standard color unless a specific color is otherwise specified in the color schedule or indicated on the Drawings.
   5. Field repair: Repair damaged areas of coated surfaces with compatible materials to equal thickness and color match of undamaged areas.

D. Repair damaged galvanized surfaces in accordance with ASTM A780. Repair materials containing cadmium and lead are not permitted.

E. Stainless steel surfaces to receive uniform passivation. Clean and restore uniform passivation layer on damaged, contaminated, or depassivated stainless steel surfaces in accordance with ASTM A380.

F. Wash coat and prime sherardized, aluminum, copper, and bronze surfaces, or prime with the manufacturer's recommended special primer.

G. Use equipment designed to apply materials specified.
   1. Use compressors with moisture traps and filters that remove water and oils from the air.
      a. Perform a paper blotter test at the Engineer's request to verify air is sufficiently free of oil and moisture. Do not allow the amount of oil and moisture to exceed the CSM-recommended amount.
   2. Equip spray equipment with properly sized mechanical agitators, pressure gauges, pressure regulators, and spray nozzles.

H. Where 2 or more coats are required, tint prime coat intermediate coats as necessary to distinguish each coating and to help indicate coverage.

I. Apply coating by brush, roller, trowel, or spray, unless a specific application method is required by the coating manufacturer's instructions or these Specifications.
   1. With a brush, stripe coat edges, welds, corners, nuts, bolts, and difficult-to-reach areas, as necessary, before spray application to ensure specified coating thickness along edges.
   2. After the prime coat dries, mark, repair, and retest pinholes and holidays before intermediate or topcoats are applied.

J. Spray application:
   1. With a brush, stripe coat edges, welds, corners, nuts, bolts, and difficult-to-reach areas, as necessary, before spray application to ensure specified coating thickness along edges.
   2. When using spray application, apply each coat to a thickness no greater than recommended in the coating manufacturer's instructions.
   3. Use airless spray method unless air spray method is required by the CSM's instruction or these Specifications.
   4. Conduct spray coating under controlled conditions. Protect adjacent construction and property from coating mist, fumes, or overspray.

K. Shop and field coats:
   1. Prime coat: Shop-apply or field-apply prime coats as specified. Use shop-applied primer compatible with the specified field coating system and apply at the minimum dry film thickness recommended by the finish coat CSM.
      a. Provide datasheets identifying the shop primer to on-site coating application personnel.
      b. Perform adhesion tests on the shop primer.
      c. Remove and recoat damaged, deteriorated, and poorly applied shop coatings.
      d. If the shop primer coat meets this Section's requirements, spot prime exposed metal of shop-primed surfaces before spray applying primer over the entire surface.
   2. Field coats: Apply field coats with one or more prime coats and finish coats to build up coating to dry film thickness specified for the coating system.
      a. Do not apply finish coats until other work in the area is complete and previous coats are inspected.
   3. Adhesion confirmation: Perform adhesion tests after proper coating cure in accordance with ASTM D3359. Demonstrate that:
      a. Primer coat adheres to the substrate.
      b. Coatings adhere to the primer and intermediate coats.
         1) Coating 5 mils or more DFT: Achieve adhesion test result of 5A on immersed surfaces and 4A or better on other surfaces.
         2) Coating less than 5 mils DFT: Achieve adhesion test results of 5B on immersed surfaces and 4B or better on other surfaces.

L. Plural component coating application:
   1. Premix contents of component drums if required by the CSM each day.
   2. Before starting application:
      a. Verify gauges are working properly.
      b. Complete ratio checks.
      c. Sample the mix on plastic sheeting to ensure set time is appropriate and complete.

d. Label and retain spray samples. Submit to the Engineer when requested.

M. Drying and recoating:
1. Provide means to prevent condensate or dew on substrate surface or between coats and during curing after applying the last coat.
2. Allow each coat to cure or dry thoroughly, in accordance with, if required, the CSM's printed instructions before recoating.
3. Use the CSM's printed instructions and the requirements specified in this Section to determine the minimum required drying time.
   a. Recoat coatings within time limits recommended by CSM.
   b. If time limits are exceeded, abrasive blast clean and de-gloss clean before applying another coat.
4. Ensure primer and intermediate coats of coating are unscarred and completely integral when applying each succeeding coat.
5. Touch up suction spots between coats and apply additional coats where required to produce finished surface of solid, even color, free of defects.
6. Repair holidays in accordance with the requirements on pertinent Coating Detail Sheets or as recommended by the CSM.
7. Sand and feather to a smooth transition and recoat scratched, contaminated, or otherwise damaged coating surfaces so repairs are invisible to the naked eye.

N. Workmanship:
1. Ensure that coated surfaces are free from runs, drips, ridges, waves, laps, dry spray, and brush marks. Coats shall be applied to produce a smooth, even film of uniform thickness completely coating corners and crevices.
2. Evenly apply each coat of material and sharply cut to a line created with masking tape or other suitable materials.
3. When coating complex steel shapes, stripe coat welds, edges of structural steel shapes, metal cut-outs, pits in steel surfaces, or rough surfaces with the primer before overall coating system application.
   a. Brush apply stripe coat to ensure proper coverage.
   b. Do not stripe coat with spray or roller.
4. Ensure that the finish coat, including repairs, has a uniform color and gloss.

O. Coating properties, mixing, and thinning:
1. If maximum recoat time is exceeded, prepare surface with solvent washing, light abrasive blasting, sanding, or other procedures in accordance with the CSM's instructions.
2. Allow adequate drying time between coats as instructed by the CSM, adjusted as necessary for the Site conditions.
3. Ensure that coatings, when applied, provide a satisfactory film and a smooth even surface. Lightly sand glossy undercoats to provide a surface suitable for proper application and adhesion of subsequent coats. Thoroughly stir and strain coating materials during application and maintain uniform consistency.
4. Mix coatings with 2 or more components in accordance with the CSM's instructions.
5. Where necessary to suit conditions of the surface, temperature, weather, and method of application, thin the coating in accordance with the CSM's recommendations.
   a. Ensure that volatile organic content (VOC) of the thinned coating complies with prevailing air pollution control regulations.

b. Thin coatings to only what is necessary to obtain proper application characteristics.
c. Use a thinner recommended by the CSM.

P. Film thickness and continuity:
1. Apply coating to the specified thicknesses.
a. Apply additional coats when necessary to achieve specified thicknesses, especially at edges and corners.
2. Verify WFT of the coating system first coat and after applying each subsequent coat.
3. Do not allow the minimum thickness at any point to deviate more than 20 percent on the low end and 120 percent on the high end from the required average.
4. Do not allow the surface area covered per gallon of coating for various types of surfaces to exceed those recommended by the CSM.
5. Apply additional coats to achieve the specified dry film thickness if brush or roller application methods cannot achieve the specified film thickness per coat.

Q. Protecting coated surfaces:
1. Do not handle, work on, or otherwise disturb coated items until the coating is completely dry and hard.
2. After installation, recoat shop-coated surfaces with specified coating system as necessary to match surrounding surfaces, and to coordinate with the specified color identification requirements.

R. Special requirements:
1. Before erection, apply all but the final finish coat to interior surfaces of roof plates, roof rafters and supports, pipe hangers, piping in contact with hangers, and contact surfaces inaccessible after assembly. Apply final coat after erection.
2. Coat structural slip-critical connections and high strength bolts and nuts after erection.
3. Areas damaged during erection:
a. Prepare surface for spot repairs as specified for the coating system.
b. Recoat with prime coat before applying subsequent coats.
c. Touch up surfaces after installation.
d. Clean and dry surfaces to be coated at time of application.
4. Coat underside of equipment bases and supports not galvanized with at least 2 coats of primer specified before setting the equipment in place.
5. Coat aluminum surfaces in contact with concrete.

3.09 COATING SYSTEMS

A. Attachment A – Schedule of Surfaces to be Coated specifies surfaces to be coated in the field with the coating systems required.

3.10 SURFACES NOT REQUIRING COATING

A. Stainless steel piping, valves, pipe supports, instrument sunshades.
   1. Clean and restore uniform passivation layer on damaged, contaminated, or de-passivated stainless-steel surfaces in accordance with ASTM A380.

B. Sliding surfaces on expansion joints, motor and pump shafts, machined surfaces at bearings and seals, grease fittings, etc.

C. Galvanized structural steel framing, galvanized roof decking, galvanized pipe supports.

D. Copper and brass pipe, fittings, valves, etc.

E. Bronze valves, bearings, bushings, and fasteners.

F. Corrosion resistant special alloys: Inconel, Alloy 20, Hastelloy, etc.

G. Plastic surfaces, except coat PVC, CPVC, and other plastic piping system exposed to sunlight.

H. Exception – Piping that is encased in concrete or cement mortar:
   1. Coat the first 6 inches of pipe to be encased.
   2. Caulk gaps and seams after encasement.

3.11 QUALITY CONTROL

A. CSA to perform, or contract with an inspection agency to perform, quality control inspection and testing of the coating work covered by this Section. These inspections shall include the following:
   1. Prepare reports, after daily coating work ends, summarizing each day's test data, observations, drawings, and photographs.
   2. Perform the following activities to confirm conformance with the specifications:
      a. Inspect ambient conditions during coating system installation at Hold Points for conformance with the specified requirements.
      b. Inspect each coated surface type and coating system applied to verify the following:
         1) Inspect materials upon receipt to ensure that the CSM supplied them.
         2) Verify that specified storage conditions for the coating system materials, solvents, and abrasives are provided.
         3) Inspect and record findings for substrate cleanliness.
         4) Inspect and record pH of concrete and metal substrates.
         5) Inspect and record substrate profile (anchor pattern).
         6) Measure and record ambient air and substrate temperature.
         7) Measure and record relative humidity.
         8) Verify that mixing of coating system materials is in accordance with the CSM's instructions.
         9) Inspect, confirm, and record that the coating system materials' "pot life" is not exceeded during installation. Inspect to verify that recoat limitations for coating materials are not exceeded.
         10) Perform adhesion testing.

11) Measure and record the coating system's thickness.
12) Verify proper curing of the coating system in accordance with the CSM's instructions.
13) Holiday or continuity testing in accordance with NACE SP0188 for coatings that will be immersed or exposed to aggressively corrosive conditions.
14) Prepare and submit written reports directly to the Owner's representative at the shift's end:
    a) Reports shall identify observations and testing relative to the quality of the surface preparation and painting/coatings work.
    b) Reports shall address any conditions observed which have the potential to adversely impact the finished painting/coating system integrity and performance.
    c) Any such findings shall be immediately repaired.

c. Verify surface profile of substrates by completing the following:
    1) Inspect preparation and application of coating detail treatment at terminations, transitions, metal embedment's in concrete, and joints and cracks in substrates.

B. Damaged factory finishes shall be repaired and, if directed by the Owner's representative, refinished the entire surfaces of the factory-finish equipment at the applicators' expense.

C. Owner-provided inspection or inspection by others does not limit the required Contractor's or CSA's responsibilities for quality workmanship or quality control. Owners' inspection is in addition to any inspection performed by the applicator.

3.12 CORRECTIVE MEASURES

A. Repair pinholes or holidays identified by holiday testing as follows:
1. Remove coating system at pinholes and holidays at least 2-inches diameter around the defect back to expose substrate.
2. Aggressively abrade or sand the intact coating system surfaces at least 3 inches beyond the removal area in all directions to produce a uniform 6- to 8-mil profile in the intact coating system.
3. Remove dust, dirt, etc., leaving clean, sound surfaces.
4. Tape to mask the periphery of the prepared intact coating area to prevent coating repair application onto the prepared area.
5. Apply the coating system with enough coats to achieve the specified finish coat thickness over the defect and coating removal area. Feather the coating onto the abraded coated surfaces around the removal area to avoid a lip and to achieve a neat repair outline.
6. Follow curing time between coats as specified by the CSM for the Site conditions. Solvent wash and abrasive blast in accordance with the CSM's instructions if the maximum recoat time is exceeded.
7. Apply coating at specified dry film thickness.

3.13 CLEANUP

A. Remove surplus materials, protective coverings, and accumulated rubbish after completing coating. Thoroughly clean surfaces and repair overspray or other coating-related damage.

3.14 FINAL INSPECTION

A. Conduct final inspection of coating system work to determine whether it meets specifications requirements.

B. Conduct subsequent final inspection with the Engineer to ensure Work is in accordance with Contract Documents requirements.

C. Mark any rework required.
   1. Re-clean and repair, as specified, at no additional cost to the Owner.

END OF SECTION

ATTACHMENT A – SCHEDULE OF SURFACES TO BE COATED

ATTACHMENT A
Schedule of Surfaces to be Coated

A. The following schedule is incomplete. Coat unlisted surfaces with same coating system as similar listed surfaces. Contact Engineer for clarification.

EPX-M-2-PWS	Metals: immersed and in contact with water being treated for domestic use (potable water).

Notes:

1: Non-immersed ferrous metal surfaces include:
- a. Doors, doorframes, ventilators, louvers, grilles, exposed sheet metal, and flashing.
- b. Pipe, valves, pipe hangers, supports and saddles, conduit, cable tray hangers, and supports.
- c. Motors and motor accessory equipment.
- d. Drive gear, drive housing, coupling housings, and miscellaneous gear drive equipment.
- e. Valve and gate operators and stands.
- f. Structural steel.
- g. Crane and hoist rails.
- h. Exterior of tanks and other containment vessels.
- i. Mechanical equipment supports, drive units, and accessories.
- j. Bare electrical equipment: boxes, exposed conduit, and accessories.
- k. Pumps not submerged.
- l. Other miscellaneous metals.

2: Immersed ferrous metal surfaces include:
- a. Interior surfaces of ferrous metal tanks.
- b. Field priming of ferrous metal surfaces with defective shop-prime coat; including non-submerged service.
- c. Bell rings, underside of manhole covers and frames.
- d. Sump pumps, including underside of base plates and submerged suction and discharge piping.
- e. Exterior of submerged piping and valves other than stainless steel or PVC piping.
- f. Submerged pipe supports and hangers.
- g. Stem guides.
- h. Other submerged iron and steel metal unless specified otherwise.

ATTACHMENT B – COATING DETAIL SHEET

Attachment B			
Coating Detail Sheet			
Coating System	EPX-M-2-PWS		
Coating Material	Ultra-high Solids Epoxy		
Substrate	Metal		
Products: One of the following or equal:	Primer	Intermediate Coat	Finish Coat
Carboline	Plasite 4500	None Applied	Plasite 4500
International Paint	No product specified	No product specified	No product specified
PPG	No product specified	No product specified	No product specified
Sherwin Williams	Sher-Plate	None Applied	Sher-Plate
Tnemec	Series 22	None Applied	Series 22
Service Condition	Immersed, moderately corrosive environment in contact with Potable Water.		
Surface Preparation			
General	Prepare surfaces as specified in this Section and as follows.		
Ferrous Metal	Bare surfaces: SSPC-SP5, White Metal Blast Cleaning. Shop primed surfaces: SSPC-SP7, Brush-Off Blast Cleaning. Damaged primer or rust: SSPC-SP5, White Metal Blast Cleaning and spot prime.		
Surface Profile			
Ferrous Metal	2.0 to 2.5 mils		
Primed surfaces	1.0 to 1.5 mils on the intact primer.		
System Thickness (Dry Film)			
Total	16 to 25 mils		
Application			
Special CTR Training	Required.		

Attachment 3

1	**Company Name**	**Office Phone**	**Cell Phone**
	City of Sacramento – DOU	*916-808-4030*	*916-208-4423*
	First Name	**Last Name**	**Email**
	Carlos	*Barragan*	*cbarragan@cityofsacramento.org*
2	**Company Name**	**Office Phone**	**Cell Phone**
	City of Sacramento – DOU		
	First Name	**Last Name**	**Email**
	Gabriel	*Aceves*	gaceves@cityofsacramento.org
3	**Company Name**	**Office Phone**	**Cell Phone**
	Sierra National Construction	*916-204-0257*	
	First Name	**Last Name**	**Email**
	Ryan	*Bailey*	ryan@sierranationalconstruction.com
4	**Company Name**	**Office Phone**	**Cell Phone**
	TNT Industrial	*916-395-8400*	*916-494-9256*
	First Name	**Last Name**	**Email**
	Aubrey		jtaylor@tntindustrial.com
5	**Company Name**	**Office Phone**	**Cell Phone**
	NMI Industrial LLC	*916-635-7030*	925-787-1776
	First Name	**Last Name**	**Email**
	Mark	*Saran*	bids@nmiindustrial.com
6	**Company Name**	**Office Phone**	**Cell Phone**
	West Shore	*916-596-0905*	*707-832-6310*
	First Name	**Last Name**	**Email**
	Nate	*Thomas*	westshoreus@gmail.com
7	**Company Name**	**Office Phone**	**Cell Phone**
	Polytech Industrial Coatings	*559-271-9900*	*559-994-6915*
	First Name	**Last Name**	**Email**
	Manuel	*Rodriguez*	manuelr@polytechcoatings.com

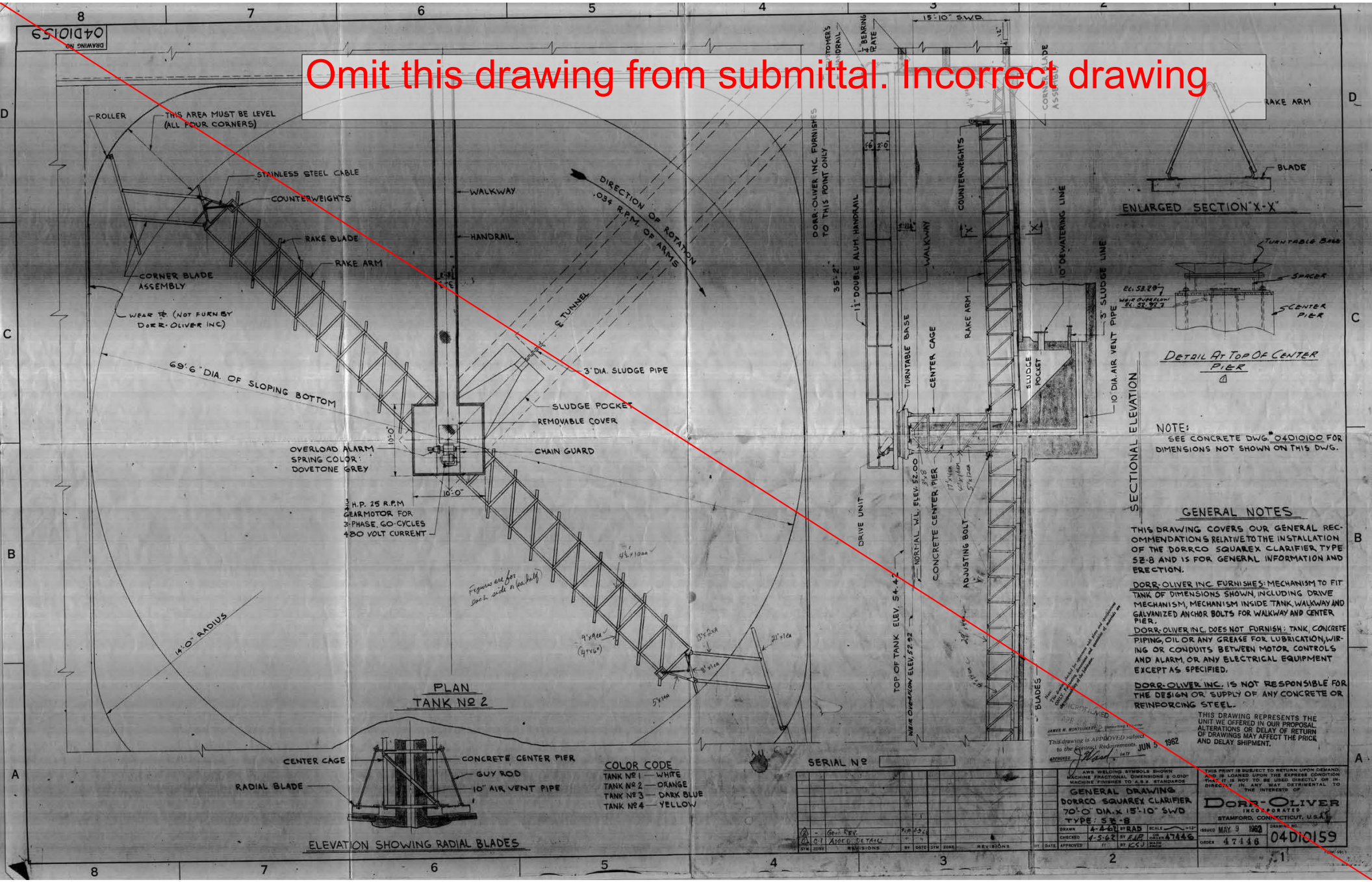
City of SACRAMENTO
Department of Utilities

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement Pre-Bid Meeting– Sign-In Sheet PN: Z14130234

1	**Company Name**	**Office Phone**	**Cell Phone**
	City of Sacramento – DOU	*916-808-4030*	*916-208-4423*
	First Name	**Last Name**	**Email**
	Carlos	*Barragan*	*cbarragan@cityofsacramento.org*
2	**Company Name**	**Office Phone**	**Cell Phone**
	City of Sac - DOU	916-808-1414	
	First Name	**Last Name**	**Email**
	Gabriel	Aceves	gaceves@cityofsacramento.org
3	**Company Name**	**Office Phone**	**Cell Phone**
	SIERRA NATIONAL CONSTRUCTION 916 204-0257		916 204-0257
	First Name	**Last Name**	**Email**
	RYAN	BAILEY	RYAN@SIERRANATIONALCONSTRUCTION.COM
4	**Company Name**	**Office Phone**	**Cell Phone**
	TNT industrial	916395 8400	916 949 9256
	First Name	**Last Name**	**Email**
	Aubrey	Sullivan	JTAYLOR@TNTindustrial.com
5	**Company Name**	**Office Phone**	**Cell Phone**
	NMI Industrial LLC	916-635-7030	925-787-1776
	First Name	**Last Name**	**Email**
	MARK	SARAN	bids@nmiindustrial.com
6	**Company Name**	**Office Phone**	**Cell Phone**
	West Shore	916 596-0905	707 832-6310
	First Name	**Last Name**	**Email**
	Nate	Thomas	westshore45@gmail.com
7	**Company Name**	**Office Phone**	**Cell Phone**
	Polytech	559-271-9900	559-994-6915
	First Name	**Last Name**	**Email**
	Manuel	Kunz	Manuel@polytechcranes.com

Attachment 4

Omit this drawing from submittal. Incorrect drawing



LBE INFORMATION

The City of Sacramento's Local Business Development program establishes an annual local business enterprise (LBE) participation goal for City contracts, and authorizes City departments to require minimum LBE participation levels in individual contracts. Under City Code section 3.60.270, all bidding contractors must meet or exceed the minimum LBE participation requirement specified in the contract's bid specifications to qualify as a responsive bidder.

For information on meeting the City of Sacramento's Local Business Enterprise (LBE) project goals, please contact Procurement Services at (916) 808-6240, or visit the City of Sacramento's small business web site at: http://portal.cityofsacramento.org/Finance/Procurement/Bid-Information#bidding-options

NOTICE TO CONTRACTORS

CITY OF SACRAMENTO

Sealed Proposals will be received by the City Clerk of the City of Sacramento at the Office of the City Clerk, New City Hall, located at 915 I Street, 5th Floor, Mayor's Reception Desk, up to the hour of 2:00 p.m. on **February 11, 2026** and opened at and read after 2:00 p.m. on **February 11, 2026,** or as soon thereafter as business allows, in the Hearing Room, 2nd Floor Room, in Historic City Hall, for construction of:

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

as set forth in the Contract Documents.

Proposals received and work performed thereunder shall comply with the requirements of Chapter 3.60 of the Sacramento City Code. Each Bid Proposal shall be accompanied by bid security of at least 10% of the sum the Bid Proposal. The City reserves the right to reject proposals or to waive any error or omission in any Bid Proposal received. Signed proposals shall be submitted on the printed forms contained herein and enclosed in an envelope marked:

SEALED PROPOSAL FOR

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement

(PN: Z14130234) (B26141322002)

You can view and download the plans and Contract Documents from:

PLANET BIDS
http://www.planetbids.com/portal/portal.cfm?CompanyID=15300#

The contractor and all subcontractors shall comply with the rates of wages currently established by the Director of Industrial Relations under provisions of Sections 1773 of the Labor Code of the State of California, a copy of which is on file in the office of the City Clerk and available to any interested party on request. In accordance with Sacramento City Code Section 3.60.180 and Section 1771.5 of the California Labor Code, the payment of the general prevailing rate of per diem wages or the general prevailing rate of per diem wages for holiday and overtime is not required for any construction project of $25,000 or less, or an alteration, demolition, repair, and maintenance project of $15,000 or less. The City of Sacramento has an approved Labor Compliance Program. **The City uses an electronic system for the submission of Labor Compliance Reports, which became effective May 1, 2007.** The contractor and every lower-tier subcontractor shall submit certified payrolls and labor compliance documentation electronically at the discretion of and in the manner specified by the City of Sacramento.

Electronic submittal is via a web-based system, accessed on the World Wide Web by a web browser. Each contractor and subcontractor is given a Log On identification and password to access the City of Sacramento's reporting system.

Use of the system may entail additional data entry of weekly payroll information including employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid, etc. The contractor's payroll and accounting software might be capable of generating a 'comma delimited file' that will interface with the software.

Department of Industrial Relations Registration and Reporting Requirements (SB 854)

Labor Code Section 1725.5 (enacted by SB 854) requires all contractors bidding on this contract, all subcontractors listed in a bid for this contract, and any contractor or subcontractor performing any work under this contract, to be currently registered with the California Department of Industrial Relations (DIR), as specified in Labor Code Section 1725.5. Labor Code Section 1771.1 (enacted by SB 854) provides that a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Every bidding contractor shall list the contractor's current DIR registration number, and the current DIR registration number of all listed subcontractors, on the Subcontractor and Local Business Enterprise (LBE) Participation Verification Form included in the contractor's bid.

Pursuant to Labor Code Section 1771.1(b): (1) any bid received from a contractor that is not currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5 **shall be rejected as non-responsive**; and (2) any bid listing one or more subcontractors on the bidder's Subcontractor and Local Business Enterprise (LBE) Participation Verification Form that are not currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5, **shall be rejected as non-responsive**, unless the listing was an inadvertent error and any of the conditions specified in Labor Code Section 1771.1(c) apply.

This contract also is subject to compliance monitoring and enforcement by the DIR. For all contracts awarded on or after April 1, 2015, California Labor Code Section 1771.4 (enacted by SB 854) requires the contractor and all subcontractors to furnish electronic payroll records directly to the Labor Commissioner (in addition to City staff via the City's electronic system).

A Fact Sheet summarizing the provisions of SB 854 is attached. This is provided solely for informational purposes, and does not in any way affect the contractor's and subcontractors' obligation to comply in all respects with the provisions of SB 854, including the provisions referenced above, as well as all other applicable laws and regulations.

The contractor shall disseminate these provisions to every lower-tier subcontractor and vendor required to provide labor compliance documentation.

All questions regarding the City's Labor Compliance Program should be directed to the Department's contracts staff or the Labor Compliance Officer at (916) 808-4011.

Pursuant to Sacramento City Code Section 3.60.190, all contractors and subcontractors shall comply with Section 1777.5 et seq., of the California Labor Code governing the employment of apprentices. Pursuant to Sacramento City Code Section 3.60.250 and Public Contract Code Section 22300, any contract awarded pursuant to this invitation to bid shall contain a provision permitting the substitution of securities for monies withheld to ensure performance under the contract, in accordance with the requirements and form specified by the City.

Bid protests must be filled and maintained in accordance with the provisions of Sections 3.60.460 through 3.60.560 of the Sacramento City Code. Bid protests that do not comply with Sections 3.60.460 through 3.60.560 of the Sacramento City Code shall be invalid and shall not be considered. A bid protest fee of $750.00 is required at the time of filing. The term "bid protest" includes any bid protest that (1) claims that one or more bidders on this contract should be disqualified or rejected for any reason, (2) contests a City staff recommendation to award this contract to a particular bidder, or (3) contests a City staff recommendation to disqualify or reject one or more bidders on this contract. A copy of Sections 3.60.460 through 3.60.560 of the Sacramento City Code may be obtained from the Project Manager, or from the City Clerk, located at 915 I Street, 5th Floor, Sacramento, CA 95814.

The Project Manager's contact information is:

Carlos Barragan, Department of Utilities, Engineering & Water Resource Division
1395 35th Avenue, Sacramento, CA 95822
Phone: (916) 808-4030 / Fax: (916) 808-1497/Email cbarragan@cityofsacramento.org

Background

Founded in 1849, The City of Sacramento is the oldest incorporated city in California and is the capital city of California. It has a population of 500,000. Sacramento is a progressive City with great pride in its ethnic and cultural diversity, concern for environmental and social issues and emphasis on quality in the provision of governmental services. Sacramento is a Charter city, which operates under the City Council Manager Form of government. It has an annual budget of $1 billion and 4,500 full-time equivalent positions.

The E.A Fairbairn Water Treatment Plant (FWTP) Grit Collector was constructed in 1962. The City is seeking to extend the beneficial life of the grit collector through replacement of the rake arm and cage assembly, recoating of the center column, and installation of safe access to the effluent channel. The rake arms and cage are showing significant signs of corrosion that are affecting its structural integrity and its nearing the end of its useful life. FWTP only has one grit collector, and its functionality is crucial in the overall treatment process. The existing access to the effluent channel does not meet current safety codes and will need to be updated.

Project Overview

The City of Sacramento FWTP Grit Collector was built in the 1960's, designed to remove solids from the raw water pumped into the Fairbairn Water Treatment Plant through the intake located on the American River. The Grit Basin has a flow capacity of 80 million gallons per day (MGD) with a surface area of 6,084 square feet (ft2) and is located at the north end of FWTP 7501 College Town Drive.

A rectangular settling basin is used to remove readily settleable material (grit) early in the treatment process. Removal of grit upstream of the treatment process prevents accumulation of material within pipes and basins and prevents damage to downstream mechanical equipment. Grit from the American River can cause increased wear on pumps, valves, chains and flights, and other process equipment. Four concrete channels approximately 4-ft x 7-ft wide across the bridge convey the raw water from the intake pump station to the grit inlet channel. Chlorine is dosed in the grit inlet channel, set to maintain a chlorine residual in the filter effluent. Grit basin effluent falls over a weir into the grit basin effluent channel, where it is then conveyed to the flash mix process. Grit that is settled out in the grit basin is collected by a circular rake system. Periodically, settled grit is pumped from the grit basin via two sand pumps, and sent to the sludge drying area, where it is combined with the sludge prior to landfill disposal.

Operations staff take the basin offline annually for cleaning and inspection. The inspection includes review of the basin for concrete cracking, rail integrity, and circular rake condition assessment. Its within these shutdown windows that construction can occur on the replacement of the rake arms and work involving the installation of the ladder to the effluent channel. First shutdown will take place from January 2026 to April 2026. Firms are required to take initial measurements for rake arm fabrication and make initial assessments of all scope of work by no later than **end of March 2026**. Construction should take place during Winter Shutdown of 2026/2027 whose dates will be provided to contractor 6 weeks prior to anticipated shutdown. The entire work shall be brought to completion on or before anticipated date that plant is to be brought back online.

The City of Sacramento Department of Utilities (DOU) is seeking Bids from qualified and experienced firms to: 1) Center pier and drive cage coating 2) grit basin cleaning 3) rake arm replacement 4) ladder and fall arrest system install 5) replacement of handrail at the effluent channel.

BAN-THE-BOX REQUIREMENTS

INTRODUCTION

On September 6, 2016, the City of Sacramento enacted an ordinance regarding criminal conviction information in the employment application process (the "Ban-the-Box Ordinance"), which added Chapter 3.62 to the Sacramento City Code and amended Section 2.40.050 of the Sacramento City Code. The Ban-the-Box Ordinance prohibits "covered employers" from asking an applicant for employment to disclose, orally or in writing, information concerning the criminal conviction history of the applicant, including any inquiry about criminal conviction history on any employment application, until the employer has determined the applicant meets the minimum employment qualifications stated in any notice issued for the position.

APPLICATION

"City Contract"

The Ban-the-Box Ordinance applies to all "city contracts." The term "city contract" means a contract awarded after January 1, 2017 to a "covered employer" for services or a public project in return for compensation of $250,000 or more. The term "city contract" includes contracts for services or public projects that were awarded for an amount less than $250,000 but were amended to increase the total compensation to $250,000 or more. The Ban-the-Box Ordinance also applies when the aggregate value of all contracts for services or public projects the City has awarded to the same "covered employer" within the previous 12 months is $250,000 or more.

The Ban-the-Box Ordinance does not apply to: (1) contracts awarded by the City Manager in response to an emergency; and (2) contracts for the purchase or lease of equipment, supplies, or other personal property, even if they include incidental services such as delivery, installation, or maintenance.

"Covered Employer"

The Ban-the-Box Ordinance only applies to "covered employers." The term "covered employer" means a person who is a party to a "city contract" and has at least 20 employees working either full or part time. The number of employees that a contractor has is determined by adding the contractor's employees and the employees of any "related person." A person is a "related person" when any of the following circumstances exists:

(1) The person and the person that is a party to a "city contract" are both corporations and:

   (a) Share a majority of members of their governing boards; or
   (b) Have two or more officers in common; or
   (c) Are controlled by the same majority shareholder or shareholders (control means more than 50% of the corporation's voting power); or
   (d) Are in a parent-subsidiary relationship (such a relationship exists when one corporation directly or indirectly owns shares possessing more than 50% of another corporation's voting power).

(2) The person otherwise controls and directs, or is controlled and directed by, the person that is a party to a city contract, as determined by the City Manager, or City Manager designee.

The term "covered employer" includes a subcontractor providing services under a "city contract" if the subcontractor has at least 20 employees, whether full- or part-time, or the amount of the subcontract is at least 25% of the amount of the "city contract."

The term "covered employer" does not include any unit of federal, state or local government.

Exceptions

The Ban-the-Box Ordinance provisions do not apply to: (1) a position for which a "covered employer" is otherwise required by law to conduct a criminal conviction history background check; or (2) a position that will not involve work pursuant to a "city contract." Additionally, the Ban-the-Box Ordinance does not prevent a "covered employer" from conducting a criminal conviction history background check in subsequent stages of the application process after initially determining whether the applicant meets the minimum employment qualifications.

COMPLIANCE

It is the contractor's responsibility to determine whether the aggregate value of $250,000 or more has been met, and to notify the City in writing whenever this is the case. It is also the contractor's responsibility to ensure that all of its subcontractors who are covered by the Ban-the-Box Ordinance comply with the provisions of the Ban-the-Box Ordinance by including these requirements in all subcontracts covered by the Ban-the-Box Ordinance.

VIOLATIONS AND MONITORING

The Ban-the-Box Ordinance provides that any violation of the Ban-the-Box Ordinance by a "covered employer" constitutes a material breach of the contract, and authorizes the City to terminate the contract. The City may also enforce the Ban-the-Box Ordinance by investigating any alleged violation (but any failure of the City to investigate does not create a right of action against the City). The City may further require "covered employers" to verify compliance.

ADDITIONAL INFORMATION

For a complete description of the Ban-the-Box Ordinance provisions related to City contracts, refer to the Ban-the-Box Ordinance, codified at Sacramento City Code Chapter 3.62. The Sacramento City Code is available on the internet at www.cityofsacramento.org.

For more information on the City's Ban-the-Box Ordinance, contact Procurement Services at 916-808-6240 or email Purchasing@cityofsacramento.org.

Contractor's Name: _____
(Please print)

CITY OF SACRAMENTO

SEALED PROPOSAL

(MUST BE SIGNED BY BIDDER)

The Sealed Proposal will be received not later than **02/11/2026**, at the Office of the City Clerk, New City Hall, at 915 I Street, 5th Floor, Mayor's Reception Desk, Sacramento, California and opened at 2:00 PM, or as soon thereafter as business allows, on **2/11/2025**, by the Office of the City Clerk, 915 I Street, Historic City Hall, 2nd Floor, Hearing Room, Sacramento, California.

TO THE HONORABLE CITY COUNCIL:

The undersigned hereby proposes and agrees to furnish any and all required labor, material, transportation, and services for

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

in the City and County of Sacramento, California.

TOTAL BID: _____ ($_____).

The work herein described is to be performed in strict conformity with the Plans, City of Sacramento Standard Specifications (Resolution No. 89-216) and these Special Provisions, all as on file in the Office of the City Clerk, at the following unit prices.

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total
1	Center Pier and Drive Cage Coating		LS	$_____	$_____
2	Grit Basin Cleaning		LS	$_____	$_____
3	Rake Arm Replacement		LS	$_____	$_____
4	Ladder and Fall Arrest System Install		LS	$_____	$_____
5	Hand Rail Install		LS	$_____	$_____
6	Warranties		LS	$_____	$_____

TOTAL BID: $_____

Contractor's Name: TNT Industrial Contractors, Inc.
(Please print)

CITY OF SACRAMENTO

SEALED PROPOSAL

(MUST BE SIGNED BY BIDDER)

The Sealed Proposal will be received not later than **02/11/2026**, at the Office of the City Clerk, New City Hall, at 915 I Street, 5th Floor, Mayor's Reception Desk, Sacramento, California and opened at 2:00 PM, or as soon thereafter as business allows, on **2/11/2025**, by the Office of the City Clerk, 915 I Street, Historic City Hall, 2nd Floor, Hearing Room, Sacramento, California.

TO THE HONORABLE CITY COUNCIL:

The undersigned hereby proposes and agrees to furnish any and all required labor, material, transportation, and services for

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

in the City and County of Sacramento, California.

TOTAL BID: Threehundred eighty nine thousand eight hundred and Fifty ($389,850).

The work herein described is to be performed in strict conformity with the Plans, City of Sacramento Standard Specifications (Resolution No. 89-216) and these Special Provisions, all as on file in the Office of the City Clerk, at the following unit prices.

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total
1	Center Pier and Drive Cage Coating	1	LS	$51,000	$51,000
2	Grit Basin Cleaning	1	LS	$30,000	$30,000
3	Rake Arm Replacement	1	LS	$276,500	$276,500
4	Ladder and Fall Arrest System Install	1	LS	$15,350	$15,350
5	Hand Rail Install	1	LS	$15,000	$15,000
6	Warranties	1	LS	$2,000	$2,000

TOTAL BID: $389,850

The undersigned agrees to execute the Agreement and provide City the executed Agreement, the required insurance certificates, endorsements, and waivers of subrogation, and the required surety bonds within ten (10) calendar days after the undersigned's receipt of the City's notice that the undersigned will be recommended for Contract award and prior to award of the Contract by the City Council.

In determining the amount bid by each bidder, City shall disregard mathematical errors in addition, subtraction, multiplication and division that appear obvious on the face of the Proposal. When such a mathematical error appears on the Proposal, the City shall have the right to correct such error and to compute the total amount bid by said bidder on the basis of the corrected figure or figures.

When the unit price of an item is required to be set forth in the Proposal, and the total for the item set forth separately does not agree with a figure derived by multiplying the item unit price times the Engineer's estimate of the quantity of work to be performed for said item, the item unit price shall prevail over the sum set forth as the total for the item unless, in the sole discretion of the City, such a procedure would be inconsistent with the policy of the City's bidding procedures. The total paid for each such item of work shall be based upon the item unit price and not the total price.

Should the Proposal contain only a total price for an item and the item unit price is omitted, the City shall determine the item unit price by dividing the total price of the item by the Engineer's estimate of the quantity of work to be performed for the item of work.

If the Proposal contains neither the item price nor the total price for the item, then it shall be deemed incomplete and the Proposal shall be disregarded.

It is understood that this bid is based upon completion of the work within a period **of 20 working days** commencing on the date specified in the Notice to Proceed.

The amount of liquidated damages to be paid by the Contractor for failure to complete the work by the completion date (as extended, if applicable) shall be **$2,500 for each working day**, continuing to the time at which the work is completed. Such amount is the actual cash value agreed upon as the loss to the City resulting from the default of the Contractor.

The undersigned represents and warrants that he/she has examined the location of the proposed work and is familiar with the conditions at the place where the work is to be done. The undersigned further represents that he/she has reviewed and understands the Plans, Special Provisions, and other contract documents, and the undersigned is satisfied with all conditions for the performance of the work. **Additionally, the undersigned shall include written documentation with the Sealed Proposal of previous satisfactory experience in installation of similar equipment described in the Scope of Services, in accordance with the following:**

- **The undersigned shall provide documentation for a minimum of three (3) projects of similar size and scope as listed in the Scope of Services performed by the undersigned for a municipality or other public agency within the last five (5) years. The documentation for each project shall describe the work performed, the contract amount and duration, and the time period of performance, and shall include the name, address and telephone number of the owner agency or municipality. The documentation also shall include the name of a contact person for each owner who is familiar with the work performed. The above documentation shall be included with the Sealed Proposal.**

- **A Sealed Proposal that does not include the above required documentation may be rejected as non-responsive.**

Please note that information included in the above documentation and/or obtained from such other owner agency or municipality or from another source regarding the bidder's performance on another public project also may be used by the City in determining whether the bidder is a responsible bidder.

The undersigned has carefully checked all of the above figures and understands that the City of Sacramento will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

This proposal shall not be withdrawn for the time periods specified in Section 3-2 of the City of Sacramento Standard Specifications for award of contract to respective low bidders. This proposal is submitted in accordance with Chapter 3.60 of the Sacramento City Code and Sections 1, 2, and 3 of the City of Sacramento Standard Specifications.

In accordance with Standard Specification Section 3-2, the City shall award this contract to the lowest responsible bidder, if such award is made, within sixty (60) working days after opening of the Proposals. The City reserves the right to reject any and all bids.

REQUIRED DOCUMENT IN SEALED BID PROPOSAL

BID DEPOSIT ENCLOSED IN THE FOLLOWING FORM:

$_____ not less than ten (10) percent of amount bid.

_____CERTIFIED CHECK

_____MONEY ORDER

_____CASHIERS' CHECK

__X__BID BOND

FOR CITY USE ONLY

TYPE OF DEPOSIT

- [x] Bid Bond
- [ ] Cashier/Certified Check
- [ ] Other_____

Reviewer's Initials: _____

CONTRACTOR

Addendum No. 1 01/22/2026

Addendum No. 2 02/09/2026

Addendum No. 3 02/11/2026

Addendum No. 4 _____

TNT Industrial Contractors, Inc.

By: _____ (Signature)

Title President

Address 3800 Happy Ln

No PO Box – Physical Address ONLY

Sacramento, CA 95827

City STATE Zip Code

Telephone No. 916-395-8400

Fax No. 916-395-8429

Email estimating@tntindustrial.com

(Federal Tax ID # or Social Security #)

Under penalty of perjury, I certify that the Taxpayer Identification Number and all other information provided here are correct.

68-0248760

DIR Registration Number: 1000000573

Valid Contractor's License No. 622974 Classification A, B is held by the bidder.

Expiration date 07/31/2027 Representation made herein are true and correct under penalty of perjury

(PN: Z14130234) (B26141322002)

City of SACRAMENTO

REQUIRED DOCUMENT IN SEALED BID PROPOSAL

BID PROPOSAL GUARANTEE

PRINCIPAL (Contractor legal name and business address)	Type of Organization ("X" one)
TNT Industrial Contractors, Inc. 3800 Happy Lane Sacramento, CA 95827	Individual Partnership X Corporation Limited Liability Co. Other: State of Organization formation:

SURETY (Name and business address,)	(agent name and phone number)
Travelers Casualty and Surety Company of America One Tower Square Hartford, CT 06183	Edgewood Partners Insurance Cente 877-222-0000

a corporation duly organized under the laws of the State of Connecticut and duly licensed to issue this bond as authorized by the State of California. California License No. 2444-B

OBLIGATION: We, the Principal and the Surety, bind ourselves, our heirs, executors, administrators and successors, jointly and severally, to the City of Sacramento ("City") as Obligee for the penal sum of ten percent (10%) of the total amount of the Principal's bid proposal submitted to the City for the project described below, to guarantee that Principal will accept the City's award of the project contract.

THE CONDITION OF THIS OBLIGATION IS -
That if the Principal has submitted a bid proposal to the City by the bid proposal due date as set forth in the invitation to bid, which date may be extended by City, for the project described as follows:

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

AND if the City awards the contract for the project to the Principal within the time and manner required under the invitation to bid, and the Principal (i) enters into a written contract, in the prescribed form, in accordance with the bid proposal, (ii) files two bonds with the City to guarantee faithful performance and payment for labor and materials, and (iii) files the required insurance policies with the City, all as required by the invitation to bid or by law, then the obligation shall be null and void; otherwise it shall be and remain in full force and effect. The Surety agrees that this obligation is not impaired by any extensions of the time for the award of the contract Principal may grant to City, and any notice to Surety of such time extension is waived. In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court, which sums shall be additional to the principal amount of this bond.

IN WITNESS WHEREOF, Surety has executed this Bid Proposal Guarantee on the day set forth in the attached notary acknowledgment. Attach Surety power of attorney form to verify signator's authority.

Principal/Contractor: TNT Industrial Contractors, Inc

By: _____
Name:

Title: President

Surety: Travelers Casualty and Surety Company of America

By: _____
Name: Erin Johnson

Title: Attorney-in-Fact

(Seal)

Revised: 2020

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

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 Sacramento }

On 2/4/2026 (Date) before me, Sandra R. Black (Insert Name of Notary exactly as it appears on the official seal), Notary Public,

personally appeared Erin Johnson (Name(s) of Signer(s)),

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____ (Signature of Notary Public)

SANDRA R. BLACK
Notary Public - California
Sacramento County
Commission # 2540579
My Comm. Expires Dec 8, 2029

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☑ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:
Travelers Casualty and Surety Company of America

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Erin Johnson** of **CONCORD**, **California**, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April, 2021**.

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **21st** day of **April, 2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2026**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **4th** day of **February**, **2026**.

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.

City of SACRAMENTO

REQUIRED DOCUMENT IN SEALED BID PROPOSAL

SUBCONTRACTOR AND LOCAL BUSINESS ENTERPRISE PARTICIPATION FORM

FOR PUBLIC PROJECTS OVER $250,000

THIS FORM MUST BE SUBMITTED WITH THE SEALED BID PROPOSAL

To be eligible for award of this contract, the bidder shall list the business entities used to attain the 5% LBE requirement. Additionally, the bidder shall list all other subcontractors who perform work, render service, or provide materials in an amount in excess of one-half of 1 percent of the total bid amount. In the case of bids for the construction of streets and highways, including bridges, subcontractors whose subcontract value exceeds one-half of 1 percent of the total bid or ten thousand dollars ($10,000), whichever is greater, shall be listed. Estimated dollar values shall be provided for all work, services or materials listed. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. The failure to attain the 5% LBE participation or the inclusion of false information or the omission of required information will render the bid non-responsive.

COPY AND ATTACH ADDITIONAL SHEETS AS NECESSARY

Prime Contractor Name	TNT Industrial Contractors Inc
(REQUIRED) Prime Contractor DIR Registration #	1000000573

Business Name	Champion Specialty Services Provider	**Subcontractor or Supplier?** *(Concrete delivery companies, temp fence companies that perform labor of installing or removing fencing and surveyors require DIR Registration)*	☑ Subcontractor ☐ Supplier
CSLB/Professional License #	992697	**DIR Registration #** *(10 digits)*	1000581683
Address	3032 Thunder Valley Ct. Ste 300	**Does this subcontractor or supplier qualify as an LBE?**	NO
City, State, Zip	Lincoln, CA 95648	**Estimated dollar value of work, services or materials to be performed of provided**	$ 39,134
Contact Person	Aaron Soto	**Type of Work, Services, or Materials to be provided to complete contract.**	
Email Address	asoto@championssc.com	High Performance Coatings	
Phone	916-803-4005		

Business Name		**Subcontractor or Supplier?** *(Concrete delivery companies, temp fence companies that perform labor of installing or removing fencing and surveyors require DIR Registration)*	☐ Subcontractor ☐ Supplier
CSLB/Professional License #		**DIR Registration #** *(10 digits)*	
Address		**Does this subcontractor or supplier qualify as an LBE?**	
City, State, Zip		**Estimated dollar value of work, services or materials to be performed of provided**	$
Contact Person		**Type of Work, Services, or Materials to be provided to complete contract.**	
Email Address			
Phone			

I hereby certify that each subcontractor listed on this LBE Participation Form has been notified that it has been listed and has consented in writing to its name being submitted for this contract. The Prime Contractor also certifies that it will notify each subcontractor listed on this Form in writing if the contract award is made to the Prime Contractor, and will make all documentation relevant to the subcontractor and LBE participation available to City of Sacramento upon request. The Prime Contractor further certifies that all of the information contained in this Form is true and correct and acknowledges that the City will rely on the accuracy of this information in awarding the contract.

	President	2/18/2026	$ 389,850
Signature (Principal of Firm)	**Title**	**Date**	**Total Bid Amount (including additive alternates if applicable)**

LOCAL BUSINESS ENTERPRISE (LBE) PARTICPATION PROGRAM

NOTE: Proposers must provide responses to the following items. Failure to provide a response to each of the items in this section may be grounds for rejection of the proposal.

1. LBE FIVE PERCENT (5%) PARTICIPATION

On April 3, 2012, the Sacramento City Council adopted a Local Business Enterprise (LBE) Preference Program to provide enhanced opportunities for the participation of local business enterprises (LBEs) in the City's contracting and procurement activities. On November 19, 2013, City Council increased the LBE preference and authorized City departments to require minimum LBE participation levels in individual contracts. Under City Code section 3.60.270 , when the bid specifications for a City contract establish a minimum participation level for LBEs, no bidder on the contract shall be considered responsive unless its bid meets the minimum LBE participation level required by the bid specifications.

The City has established a minimum 5% participation level for LBEs on this contract. Pursuant to City Code Section 3.60.270, no bidder on this contract shall be considered responsive unless its bid meets or exceeds this minimum participation level.

Local Business Enterprise means a business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or other business entity that has a legitimate business presence in the city or unincorporated county of Sacramento. Evidence of legitimate business presence in the city or unincorporated county of Sacramento shall include:

1. Having a current City of Sacramento Business Operation Tax or County of Sacramento Business License; and
2. Having either of the following types of offices or workspace operating legally within the city or unincorporated county of Sacramento:
    a. The LBE's principle business office or workspace; or
    b. The LBE's regional, branch or satellite office with at least one full time employee located in the city or unincorporated county of Sacramento.

A. LOCAL BUSINESS ENTERPRISE (LBE)

Is the firm submitting the bid qualified as a local business enterprise? Check the appropriate box below:

[X] **YES** - the firm submitting the bid is qualified as a local business enterprise.

[ ] **NO** - the firm submitting the bid is not qualified as a local business enterprise.

If the response to the above is YES, provide the City of Sacramento Business Operations Tax Certificate Number and/or County of Sacramento Business License Number:

1041391

If the response to the above is YES, provide a current copy of the City of Sacramento Business Operations Tax Certificate and/or County of Sacramento Business License.

If the response to the above is YES, provide business office or workspace address*:

3800 Happy Lane

Sacramento, CA 95827

* Address must be a physical address for the basis of location, this excludes P.O. Box addresses.

DRUG-FREE WORKPLACE POLICY AND AFFIDAVIT

BID MAY BE DECLARED NONRESPONSIVE IF THIS FORM (COMPLETED) IS NOT ATTACHED.
Pursuant to City Council Resolution CC90-498 dated 6/26/90 the following is required.

The undersigned contractor certifies that it and all subcontractors performing under this contract will provide a drug-free workplace by:

1. Publishing a "Drug-Free Workplace" statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Establishing a Drug-Free Awareness Program to inform employees about:

   a. The dangers of drug abuse in the workplace.
   b. The contractor's policy of maintaining a drug-free workplace.
   c. Any available drug counseling, rehabilitation, and employee assistance program.
   d. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

3. Notify employees that as a condition of employment under this contract, employees will be expected to:

   a. Abide by the terms of the statement.
   b. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace.

4. Making it a requirement that each employee to be engaged in the performance of the contract be given a copy on the "Drug-Free Workplace" statement.

5. Taking one of the following appropriate actions, within thirty (30) days of receiving notice from an employee or otherwise receiving such notice, that said employee has received a drug conviction for a violation occurring in the workplace:

   a. Taking appropriate disciplinary action against such an employee, up to and including termination; or
   b. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement or other appropriate agency.

* I certify that no person employed by this company, corporation, or business has been convicted of any criminal drug statute violation on any job site or project where this company, corporation, or business was performing work within three (3) years of the date of my signature below.

EXCEPTION:

Date	Violation Type	Place of Occurrence

If additional space is required use back of this form.

*The above statement will also be incorporated as a part of each subcontract agreement for any and all subcontractors selected for performance on this project.

IN THE EVENT THIS COMPANY, CORPORATION, OR BUSINESS IS AWARDED THIS CONSTRUCTION CONTRACT, AS A RESULT OF THIS BID; THE CONTRACTOR WITH HIS/HER SIGNATURE REPRESENTS TO THE CITY THAT THE INFORMATION DISCLOSED IN THIS DOCUMENT IS COMPLETE AND ACCURATE. IT IS UNDERSTOOD AND AGREED THAT FALSE CERTIFICATION IS SUBJECT TO IMMEDIATE TERMINATION BY THE CITY.

The Representations Made Herein On This Document Are Made Under Penalty Of Perjury.

CONTRACTOR'S NAME: TNT Industrial Contractors, Inc.

BY: _____ Joshua Twist; President Date: 02/18/2026
Signature Title

Effects of violations: a. Suspension of payments under this contract. b. Suspension or termination of the contract. c. Suspension or debarment of the contractor from receiving any contract from the City of Sacramento for a period not to exceed five years.
FM 681 7/10/9

MINIMUM QUALIFICATIONS QUESTIONNAIRE

Sacramento City Code Section 3.60.020 authorizes the Sacramento City Council to adopt standard minimum qualifications for bidders on competitively bid public works construction projects, and requires, among other provisions, that a bidder meet such minimum qualifications at the time of bid opening in order to bid. On July 31, 2007, the City Council adopted Resolution No. 2007-574 establishing these standard minimum qualifications. Pursuant to City Code section 3.60.020, a bidder failing to meet these minimum qualifications at the time of bid opening shall not be considered a responsible bidder for purposes of bidding on the subject project.

All bidders must demonstrate compliance with the minimum qualifications established by Resolution No. 2007-574 by completing all of the questions contained in this questionnaire. Bidder responses shall be limited to those operating business units, offices, branches and/or subsidiary divisions of the bidder that will be involved with the performance of any project work if awarded the contract. If a bidder answers "yes" to any single question, fails to submit a fully completed questionnaire, or submits false information, this will result in a determination that the minimum qualifications are not met, and the bidder shall not be considered a qualified bidder for purposes of bidding on this contract. If two or more entities submit a bid on a contract as a Joint Venture, each entity within the Joint Venture must separately meet these minimum qualifications for the Joint Venture to be considered a qualified bidder.

The City of Sacramento ("City") shall make its determination on the basis of the submitted questionnaire, as well as any relevant information that is obtained from others or as a result of investigation by the City. While it is the intent of this questionnaire to assist the City in determining whether bidders possess the minimum qualifications necessary to submit bids on the City's competitively bid public works construction contracts, the fact that a bidder submits a questionnaire demonstrating that it meets these minimum qualifications shall not in any way limit or affect the City's ability to: (1) review other information contained in the bid submitted by the bidder, and additional relevant information, and determine whether the contractor is a responsive and/or responsible bidder; or (2) establish pre-qualification requirements for a specific contract or contracts.

By submitting this questionnaire, the bidder consents to the disclosure of its questionnaire answers: (i) to third parties for purposes of verification and investigation; (ii) in connection with any protest, challenge or appeal of any action taken by the City; and (iii) as required by any law or regulation, including without limitation the California Public Records Act (Calif. Gov't Code sections 6250 et seq.). Each questionnaire must be signed under penalty of perjury in the manner designated at the end of the form, by an individual who has the legal authority to bind the bidder submitting the questionnaire. If any information provided by a bidder becomes inaccurate, the bidder shall immediately notify the City and provide updated accurate information in writing, under penalty of perjury.

QUESTIONNAIRE

NOTICE: **For firms that maintain other operating business units, offices, branches and/or subsidiary divisions that will not be involved with the performance of any project work if the firm is awarded the contract, references hereafter to "your firm" shall mean only those operating business units, offices, branches and/or subsidiary divisions that will be involved with the performance of any project work.**

All of the following questions regarding "your firm" refer to the firm (corporation, partnership or sole proprietor) submitting this questionnaire, as well as any firm(s) with which any of your firm's owners, officers, or partners are or have been associated as an owner, officer, partner or similar position within the last five years

The firm submitting this questionnaire shall not be considered a responsible bidder if the answer to any of these questions is "yes", or if the firm submits a questionnaire that is not fully completed or contains false information.

1. **Classification & Expiration Date(s) of California** Contractor's License Number(s) held by firm:

   622974 A, B 02/18/2026

2. Has a contractor's license held by your firm and/or any owner, officer or partner of your firm been revoked at any time in the last five years?

   Yes ☒ No

3. Within the last five years, has a surety firm completed a contract on your firm's 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 minimum qualifications questionnaire, is your firm ineligible to bid on or be awarded a public works contract, or perform as a subcontractor 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 during 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 construction project, or the bidding or performance of a government contract?

   ☐ Yes ☒ No

6. Answer either subsection A or B, as applicable:

A. Your firm has completed three or more government construction contracts in Sacramento County within the last five years: Within those five years, has your firm been assessed liquidated damages on three or more government construction contracts in Sacramento County for failure to complete contract work on time?

NOTE: If there is a pending administrative or court action challenging the assessment of liquidated damages on a government contract within the last five years, you need not include that contract in responding to this question.

☐ Yes ☒ No ☐ Not applicable

OR

B. Your firm has not completed at least three government construction contracts in Sacramento County within the last five years: Within the last three years, has your firm been assessed liquidated damages on three or more government construction contracts for failure to complete contract work on time?

NOTE: If there is a pending administrative or court action challenging an assessment of liquidated damages on a government contract within the last three years, you need not include that contract in responding to this question.

☐ Yes ☐ No ☒ Not applicable

7. In the last three years has your firm been debarred from bidding on, or completing, any government agency or public works construction contract for any reason?

NOTE: If there is a pending administrative or court action challenging a debarment, you need not include that debarment in responding to this question.

☐ Yes ☒ No

8. Has CAL OSHA assessed a total of three or more penalties against your firm for any "serious" or "willful" violation occurring on construction projects performed in Sacramento County at any time within the last three years?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

☐ Yes ☒ No

9. Answer either subsection A or B, as preferred:

A. In the last three years has your firm had a three year average Workers' Compensation experience modification rate exceeding 1.1?

☐ Yes ☒ No

OR

B. In the last three years has your firm had a three-year average incident rate for total lost workday cases exceeding 10?

NOTE: Incident rates represent the number of lost workday cases per 100 full-time workers and is to be calculated as: (N/EH) x 200,000, where

N = number of lost workday cases (as defined by the U.S. Dept. of Labor, Bureau of Labor Statistics)

EH = total hours worked by all employees during the calendar year

200,000 = base for 100 equivalent full-time working (working 40 hours per week, 50 weeks per year)

☐ Yes ☐ No

10. In the past three years, has the federal EPA, Region IX or a California Air Quality Management District or Regional Water Quality Control Board assessed penalties three or more times, either against your firm, or against the project owner for a violation resulting in whole or in part from any action or omission by your firm on a project on which your firm was a contractor in Sacramento County?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

☐ Yes ☒ No

11. In the past three years, has the federal EPA, Region IX or a California Air Quality Management District or Regional Water Quality Control Board assessed a single penalty of $100,000 or more, either against your firm, or against the project owner for a violation resulting in whole or in part from any action or omission by your firm on a project on which your firm was the contractor in Sacramento County?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

☐ Yes ☒ No

12. In the past three years, have civil penalties been assessed against your firm pursuant to California Labor Code 1777.7 for violation of California public works apprenticeship requirements, three or more times?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

☐ Yes ☒ No

13. 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, three or more times?

NOTE: If there is a pending administrative or court action appealing a withholding or penalty assessment, you need not include that withholding or penalty assessment in responding to this question.

☐ Yes ☒ No

14. Has your firm been assessed penalties for violation of public works prevailing wage requirements in California, in an aggregate amount for the past three years of $50,000 or more?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

☐ Yes ☒ No

VERIFICATION AND SIGNATURE

I, the undersigned, certify and declare that I have read all the foregoing answers to this Minimum Qualifications Questionnaire, and know their contents. The matters stated in these Questionnaire answers are true of my own knowledge and belief, except as to those matters stated on information and belief, and as to those matters I believe them to be true. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signed at Sacramento, CA (Location), on 02/18/2026 (Date)

Signature: _____

Print name: Joshua Twist

Title: President

NOTE: If two or more entities submit a bid on a contract as a Joint Venture, each entity within the Joint Venture must submit a separate Minimum Qualifications Questionnaire.

REQUIREMENTS OF THE NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

INTRODUCTION

The Sacramento Non-Discrimination In Employee Benefits Code (the "Ordinance"), codified as Sacramento City Code Chapter 3.54, prohibits City contractors from discriminating in the provision of employee benefits between employees with spouses and employees with domestic partners, and between the spouses and domestic partners of employees.

APPLICATION

The provisions of the Ordinance apply to any contract or agreement (as defined below), between a Contractor and the City of Sacramento, in an amount exceeding $250,000.00. The Ordinance applies to that portion of a contractor's operations that occur: (i) within the City of Sacramento; (ii) on real property outside the City of Sacramento if the property is owned by the City or if the City has a right to occupy the property; or (iii) at any location where a significant amount of work related to a City contract is being performed.

The Ordinance does not apply: to subcontractors or subcontracts of any Contractor or contractors; to transactions entered into pursuant to cooperative purchasing agreements approved by the Sacramento City Council; to legal contracts of other governmental jurisdictions or public agencies without separate competitive bidding by the City; where the requirements of the ordinance will violate or are inconsistent with the terms or conditions of a grant, subvention or agreement with a public agency or the instructions of an authorized representative of any such agency with respect to any such grant, subvention or agreement; to permits for excavation or street construction; or to agreements for the use of City right-of-way where a contracting utility has the power of eminent domain.

DEFINITIONS

As set forth in the Ordinance, the following definitions apply:

"Contract" means an agreement for public works or improvements to be performed, or for goods or services to be purchased or grants to be provided, at the expense of the City or to be paid out of moneys deposited in the treasury or out of the trust money under the control or collected by the City. "Contract" also means a written agreement for the exclusive use ("exclusive use" means the right to use or occupy real property to the exclusion of others, other than the right reserved by the fee owner) or occupancy of real property for a term exceeding 29 days in any calendar year, whether by singular or cumulative instrument, (i) for the operation or use by others of real property owned or controlled by the City for the operation of a business, social, or other establishment or organization, including leases, concessions, franchises and easements, or (ii) for the City's use or occupancy of real property owned by others, including leases, concessions, franchises and easements.

"Contract" shall not include: a revocable at-will use or encroachment permit for the use of or encroachment on City property regardless of the ultimate duration of such permit; excavation, street construction or street use permits; agreements for the use of City right-of-way where a contracting utility has the power of eminent domain; or agreements governing the use of City property that constitute a public forum for activities that are primarily for the purpose of espousing or advocating causes or ideas and that are generally protected by the First Amendment to the United States Constitution or that are primarily recreational in nature.

"Contractor" means any person or persons, firm, partnership, corporation, company, or combination thereof, that enters into a Contract with the City. "Contractor" does not include a public entity.

"Domestic Partner" means any person who has a currently registered domestic partnership with a governmental entity pursuant to state or local law authorizing the registration.

"Employee Benefits" means bereavement leave; disability, life, and other types of insurance; family medical leave; health benefits; membership or membership discounts; moving expenses; pension and retirement benefits; vacation; travel benefits; and any other benefit given to employees. "Employee benefits" shall not include benefits to the extent that the application of the requirements of this chapter to such benefits may be preempted by federal or state.

CONTRACTOR'S OBLIGATION TO PROVIDE THE CITY WITH DOCUMENTATION AND INFORMATION

Contractor shall provide the City with documentation and information verifying its compliance with the requirements of the Ordinance within ten (10) days of receipt of a request from the City. Contractors shall keep accurate payroll records, showing, for each City Contract, the employee's name, address, Social Security number, work classification, straight time pay rate, overtime pay rate, overtime hours worked, status and exemptions, and benefits for each day and pay period that the employee works on the City Contract. Each request for payroll records shall be accompanied by an affidavit to be completed and returned by the Contractor, as stated, attesting that the information contained in the payroll records is true and correct, and that the Contractor has complied with the requirements of the Ordinance. A violation of the Ordinance or noncompliance with the requirements of the Ordinance shall constitute a breach of contract.

EMPLOYER NOTICE REQUIREMENTS

(a) The Contractor shall give each existing employee working directing on a City Contract, and (at the time of hire), each new employee, a copy of the notification provided as Attachment "A."

(b) Contractor shall post, in a place visible to all employees, a copy of the notice provided as Attachment "B."

YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

On ..... (date), your employer (the "Employer") entered into a contract with the City of Sacramento (the "City") for ..... (contract details), and as a condition of that contract, agreed to abide by the requirements of the City's Non-Discrimination In Employee Benefits Code (Sacramento City Code Section 3.54).

The Ordinance does not require the Employer to provide employee benefits. The Ordinance does require that if certain employee benefits are provided by the Employer, that those benefits be provided without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouse or domestic partner of employees.

The Ordinance covers any employee working on the specific contract referenced above, but only for the period of time while those employees are actually working on this specific contract.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Vacation
- Travel benefits
- Moving expenses
- Pension and retirement benefits
- Health benefits
- Membership or membership discounts
- Any other benefits given to employees

(Employee Benefits does not include benefits that may be preempted by federal or state law.)

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, or in the application of these employee benefits, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of the Ordinance, and after having exhausted all remedies with your employer,

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

  City of Sacramento
  Procurement Services Division
  915 I Street, Second Floor
  Sacramento, CA 95814

- Bring an action in the appropriate division of the Superior Court of the State of California against the Employer and obtain the following remedies:

  - Reinstatement, injunctive relief, compensatory damages and punitive damages

  - Reasonable attorney's fees and costs

YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

If your employer provides employee benefits, they must be provided to those employees working on a City of Sacramento contract without discriminating between employees with spouses and employees with domestic partners.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to Employees

If you feel you have been discriminated against by your employer . . .

You May . . .

○ Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Procurement Services Division
915 I Street, Second Floor
Sacramento, CA 95814

○ Bring an action in the appropriate division of the Superior Court of the State of California against the employer and obtain reinstatement, injunctive relief, compensatory damages, punitive damages and reasonable attorney's fees and costs.

Discrimination and Retaliation Prohibited.

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of this Ordinance . . .

You May Also . . .

Submit a written complaint to the City of Sacramento, Contract Services Unit, at the same address, containing the details of the alleged violation.

CITY OF SACRAMENTO
PERFORMANCE BOND
Department of Utilities

Bond # 108393758
Premium: $3,509.00

WHEREAS, the City of Sacramento, in the State of California, hereinafter called City has conditionally awarded to (*here insert full name and address of Contractor*): TNT Industrial Contractors, Inc., 3800 Happy Lane, Sacramento, CA 95827

as principal, hereinafter called Contractor, an agreement for construction of:

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

in accordance with the plans, specifications, drawings, conditions, and project manual prepared therefore, which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the Contract, Contractor is required to furnish a bond for the faithful performance of the Contract.

NOW, THEREFORE, we the Contractor and (*here insert full name and address of Surety*):

Travelers Casualty and Surety Company of America
One Tower Square, Hartford, CT 06123, a corporation duly authorized and admitted to transact business and issue surety bonds in the State of California, hereinafter called Surety, are held and firmly bound unto the City, as obligee, in the sum of Three Hundred Eighty-Nine Thousand, Eight Hundred Fifty & 00/100 DOLLARS $ 389,850.00, for the payment of which sum well and truly to be made, we the Contractor and Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally. The condition of this obligation is such that, if the Contractor, Contractor's heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and fully perform all covenants, conditions and agreements required to be kept and performed by Contractor in the Contract and any changes, additions or alterations made thereto, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meanings, and shall indemnify and save harmless the City, its officers, employees and agents, as therein provided, then this obligation shall be null and void; otherwise shall be and remain in full force and effect. This obligation shall remain in full force and effect until (1) the date that the Contractor no longer has any remaining obligation of performance under the Contract, or (2) the date that is one year after the date that the work to be performed under the Contract is accepted as complete by the City, whichever occurs later.

As part of the obligation secured hereby and in addition to the sum specified above, there shall be included all costs, expenses and fees, including attorney's fees, reasonably incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgement rendered.

The 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 to 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, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by authorized representatives of the Contractor and Surety.
SIGNED AND SEALED on February 25, 2026.

TNT Industrial Contractors, Inc
(Contractor) (Seal)

By _____

Title Joshua Twist, President

ORIGINAL APPROVED AS TO FORM:

_____
City Attorney

Travelers Casualty and Surety Company of America
(Surety) (Seal)

By _____

Title Erin Johnson, Attorney-in-Fact

Agent Name and Address: Edgewood Partners Insurance Center
10877 White Rock Road, Ste. 300
Rancho Cordova, CA 95670
Agent Phone # 916-974-4614
Surety Phone # 916-852-5202
California License # OB29370 (EPIC) 2444-8 (Surety)
Surety Email: krbaptis@travelers.com

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

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 Sacramento }

On 2/25/2026 (Date) before me, Sandra R. Black (Insert Name of Notary exactly as it appears on the official seal), Notary Public,

personally appeared Erin Johnson (Name(s) of Signer(s))

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

SANDRA R. BLACK
Notary Public - California
Sacramento County
Commission # 2540579
My Comm. Expires Dec 8, 2029

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____ (Signature of Notary Public)

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☑ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:
Travelers Casualty and Surety Company of America

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Erin Johnson** of **CONCORD** , **California** , their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April, 2021.**

State of Connecticut

By: _____
Robert L. Raney, Senior Vice President

City of Hartford ss.

On this the **21st** day of **April, 2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2026**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 25th day of February, 2026

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.

CITY OF SACRAMENTO
PAYMENT BOND
Department of Utilities

Bond No: 108393758
Premium: Included

WHEREAS, the City of Sacramento, in the State of California, hereinafter called City, has conditionally awarded to: (*insert full name and address of Contractor*): TNT Industrial Contractors, Inc., 3800 Happy Lane, Sacramento, CA 95827

hereinafter called Contractor, a contract for construction of:

E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
(PN: Z14130234) (B26141322002)

Which contract is by reference incorporated herein and made a part hereof, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the Contract and pursuant to Chapter 5 of Title 3 of Part 6 of Division 4 of the California Civil Code (commencing with Civil Code Section 9550), Contractor is required to furnish a good and sufficient payment bond to secure payment of the claims to which reference is made in Civil Code Section 9554.

NOW, THEREFORE, we the Contractor and (*here insert full name and address of Surety*):

Travelers Casualty and Surety Company of America
One Tower Square, Hartford, CT 06183-6014, a corporation a corporation duly authorized and admitted to transact business and issue surety bonds in the State of California, hereinafter called Surety, are held and firmly bound unto the City, and unto all persons or entities entitled to assert a claim against a payment bond under any of the aforesaid Civil Code provisions in the sum of Three Hundred Eighty-Nine Thousand, Eight Hundred Fifty & 00/100 DOLLARS ($389,850.00), on the condition that if Contractor shall fail to pay for any materials or equipment furnished or used in performance of the Contract, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board or the Employment Development Department from the wages of employees of the Contractor and all subcontractors with respect to such work or labor, then the Surety shall pay the same in an amount not exceeding the sum specified above. If suit is brought upon this bond, Surety shall pay, in addition to the above sum, all costs, expenses and fees, including attorney's fees, reasonably incurred by any party in successfully enforcing the obligation secured hereby, all to be taxed as costs and included in any judgment rendered. Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect, and shall bind Contractor, Surety, their heirs, executors, administrators, successors and assigns, jointly and severally.

It is hereby stipulated and agreed that this bond shall inure to the benefit of all persons, companies, corporations, political subdivisions, State agencies and other entities entitled to assert a claim against a payment bond under any of the aforesaid Civil Code provisions, so as to give a right of action to them or their assigns in any suit brought upon this bond. The 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 to 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, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by authorized representatives of the Contractor and Surety. SIGNED AND SEALED on February 25 2026.

TNT Industrial Contractors, Inc
(Contractor) (Seal)

By _____

Title Joshua Twist, President

ORIGINAL APPROVED AS TO FORM:

_____
City Attorney

Travelers Casualty and Surety Company of America
(Surety) (Seal)

By Erin Johnson

Title Erin Johnson, Attorney-in-Fact
Agent Name and Address
Edgewood Partners Insurance Center
10877 White Rock Road, Ste. 300, Rancho Cordova, CA 95670
Agent Phone # 916-974-4614
Surety Phone # 916-852-5202
California License # OB29370 (EPIC) 2444-8 (Surety)
Surety Email: krbaptis@travelers.com

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

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 Sacramento }

On 3/25/2026 (Date) before me, Sandra R. Black (Insert Name of Notary exactly as it appears on the official seal), Notary Public,

personally appeared Erin Johnson (Name(s) of Signer(s)),

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____ (Signature of Notary Public)

SANDRA R. BLACK
Notary Public - California
Sacramento County
Commission # 2540579
My Comm. Expires Dec 8, 2029

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☑ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:
Travelers Casualty and Surety Company of America

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name: _____
- ☐ Individual
- ☐ Corporate Officer — Title(s): _____
- ☐ Partner ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Erin Johnson** of **CONCORD** , **California** , their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April, 2021**.

State of Connecticut

By: _____
Robert L. Raney, Senior Vice President

City of Hartford ss.

On this the **21st** day of **April, 2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2026**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 25th day of February, 2026

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 2/24/2026

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Edgewood Partners Insurance Center
1390 Willow Pass Rd, Ste 800
Concord CA 94520
License#: 0B29370

CONTACT NAME: Jake Moore
PHONE (A/C, No, Ext): (925) 822-9003 **FAX (A/C, No):**
E-MAIL ADDRESS: jake.moore@epicbrokers.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Travelers Property Casualty Co of Amer	25674
INSURER B : The Travelers Indemnity Company of CT	25682
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
TNT Industrial Contractors, Inc.
3800 Happy Lane
Sacramento, CA 95827

COVERAGES **CERTIFICATE NUMBER:** 13465120 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	X COMMERCIAL GENERAL LIABILITY	Y	Y	DT22CO4W090069TCT25	4/1/2025	4/1/2026	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 300,000
	X 5,000 DED						MED EXP (Any one person)	$ 5,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
A	AUTOMOBILE LIABILITY	Y	Y	8104W11312A2526G	4/1/2025	4/1/2026	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
	X AutoPhysical						COMP/COLL DED	$ 1,000 /1,000
A	X UMBRELLA LIAB X OCCUR	Y	Y	CUP4W4059872526	4/1/2025	4/1/2026	EACH OCCURRENCE	$ 9,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 9,000,000
	DED X RETENTION $ 10,000							$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N		Y	UB1Y3167782526G	4/1/2025	4/1/2026	X PER STATUTE / OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y (Mandatory in NH) N/A						E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
A	Inland Marine Package			QT6604W11321125	4/1/2025	4/1/2026	Installation Flr Deductible	700,000JbSte 5,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
RE: E.A. Fairbairn WTP Grit Separator Rake Arm Replacement
Additional Insured(s); City of Sacramento, its officials, employees, and volunteers

When required by written contract, Additional Insured status with primary coverage applies to General Liability and Automobile Liability and Waiver of Subrogation applies to General Liability, Automobile Liability, and Workers' Compensation, all per the attached endorsements.

CERTIFICATE HOLDER

City of Sacramento
c/o EXIGIS LLC
P.O. Box 947
Murrieta CA 92564

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

© 1988-2015 ACORD CORPORATION. All rights reserved.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BLANKET ADDITIONAL INSURED
(Includes Products-Completed Operations If Required By Contract)

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

PROVISIONS

The following is added to **SECTION II – WHO IS AN INSURED**:

Any person or organization that you agree in a written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only:

a. With respect to liability for "bodily injury" or "property damage" that occurs, or for "personal injury" caused by an offense that is committed, subsequent to the signing of that contract or agreement and while that part of the contract or agreement is in effect; and

b. If, and only to the extent that, such injury or damage is caused by acts or omissions of you or your subcontractor in the performance of "your work" to which the written contract or agreement applies. Such person or organization does not qualify as an additional insured with respect to the independent acts or omissions of such person or organization.

The insurance provided to such additional insured is subject to the following provisions:

a. If the Limits of Insurance of this Coverage Part shown in the Declarations exceed the minimum limits required by the written contract or agreement, the insurance provided to the additional insured will be limited to such minimum required limits. For the purposes of determining whether this limitation applies, the minimum limits required by the written contract or agreement will be considered to include the minimum limits of any Umbrella or Excess liability coverage required for the additional insured by that written contract or agreement. This provision will not increase the limits of insurance described in Section III – Limits Of Insurance.

b. The insurance provided to such additional insured does not apply to:

(1) Any "bodily injury", "property damage" or "personal injury" arising out of the providing, or failure to provide, any professional architectural, engineering or surveying services, including:

(a) The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders or change orders, or the preparing, approving, or failing to prepare or approve, drawings and specifications; and

(b) Supervisory, inspection, architectural or engineering activities.

(2) Any "bodily injury" or "property damage" caused by "your work" and included in the "products-completed operations hazard" unless the written contract or agreement specifically requires you to provide such coverage for that additional insured during the policy period.

c. The additional insured must comply with the following duties:

(1) Give us written notice as soon as practicable of an "occurrence" or an offense which may result in a claim. To the extent possible, such notice should include:

(a) How, when and where the "occurrence" or offense took place;

(b) The names and addresses of any injured persons and witnesses; and

(c) The nature and location of any injury or damage arising out of the "occurrence" or offense.

(2) If a claim is made or "suit" is brought against the additional insured:

© 2018 The Travelers Indemnity Company. All rights reserved.

(a) Immediately record the specifics of the claim or "suit" and the date received; and

(b) Notify us as soon as practicable and see to it that we receive written notice of the claim or "suit" as soon as practicable.

(3) Immediately send us copies of all legal papers received in connection with the claim or "suit", cooperate with us in the investigation or settlement of the claim or defense against the "suit", and otherwise comply with all policy conditions.

(4) Tender the defense and indemnity of any claim or "suit" to any provider of other insurance which would cover such additional insured for a loss we cover. However, this condition does not affect whether the insurance provided to such additional insured is primary to other insurance available to such additional insured which covers that person or organization as a named insured as described in Paragraph **4.**, Other Insurance, of Section **IV** – Commercial General Liability Conditions.

© 2018 The Travelers Indemnity Company. All rights reserved.

c. **Method Of Sharing**

If all of the other insurance permits contribution by equal shares, we will follow this method also. Under this approach each insurer contributes equal amounts until it has paid its applicable limit of insurance or none of the loss remains, whichever comes first.

If any of the other insurance does not permit contribution by equal shares, we will contribute by limits. Under this method, each insurer's share is based on the ratio of its applicable limit of insurance to the total applicable limits of insurance of all insurers.

d. **Primary And Non-Contributory Insurance If Required By Written Contract**

If you specifically agree in a written contract or agreement that the insurance afforded to an insured under this Coverage Part must apply on a primary basis, or a primary and non-contributory basis, this insurance is primary to other insurance that is available to such insured which covers such insured as a named insured, and we will not share with that other insurance, provided that:

(1) The "bodily injury" or "property damage" for which coverage is sought occurs; and

(2) The "personal and advertising injury" for which coverage is sought is caused by an offense that is committed;

subsequent to the signing of that contract or agreement by you.

5. **Premium Audit**

a. We will compute all premiums for this Coverage Part in accordance with our rules and rates.

b. Premium shown in this Coverage Part as advance premium is a deposit premium only. At the close of each audit period we will compute the earned premium for that period and send notice to the first Named Insured. The due date for audit and retrospective premiums is the date shown as the due date on the bill. If the sum of the advance and audit premiums paid for the policy period is greater than the earned premium, we will return the excess to the first Named Insured.

c. The first Named Insured must keep records of the information we need for premium computation, and send us copies at such times as we may request.

6. **Representations**

By accepting this policy, you agree:

a. The statements in the Declarations are accurate and complete;

b. Those statements are based upon representations you made to us; and

c. We have issued this policy in reliance upon your representations.

The unintentional omission of, or unintentional error in, any information provided by you which we relied upon in issuing this policy will not prejudice your rights under this insurance. However, this provision does not affect our right to collect additional premium or to exercise our rights of cancellation or nonrenewal in accordance with applicable insurance laws or regulations.

7. **Separation Of Insureds**

Except with respect to the Limits of Insurance, and any rights or duties specifically assigned in this Coverage Part to the first Named Insured, this insurance applies:

a. As if each Named Insured were the only Named Insured; and

b. Separately to each insured against whom claim is made or "suit" is brought.

8. **Transfer Of Rights Of Recovery Against Others To Us**

If the insured has rights to recover all or part of any payment we have made under this Coverage Part, those rights are transferred to us. The insured must do nothing after loss to impair them. At our request, the insured will bring "suit" or transfer those rights to us and help us enforce them.

9. **When We Do Not Renew**

If we decide not to renew this Coverage Part, we will mail or deliver to the first Named Insured shown in the Declarations written notice of the nonrenewal not less than 30 days before the expiration date.

If notice is mailed, proof of mailing will be sufficient proof of notice.

SECTION V – DEFINITIONS

1. "Advertisement" means a notice that is broadcast or published to the general public or specific market segments about your goods, products or services for the purpose of attracting customers or supporters. For the purposes of this definition:

a. Notices that are published include material placed on the Internet or on similar electronic means of communication; and

b. Regarding websites, only that part of a website that is about your goods, products or services for the purposes of attracting customers or supporters is considered an advertisement.

© 2017 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

XTEND ENDORSEMENT FOR CONTRACTORS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to this Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

A. Who Is An Insured – Unnamed Subsidiaries

B. Blanket Additional Insured – Governmental Entities – Permits Or Authorizations Relating To Operations

C. Incidental Medical Malpractice

D. Blanket Waiver Of Subrogation

E. Contractual Liability – Railroads

F. Damage To Premises Rented To You

PROVISIONS

A. WHO IS AN INSURED – UNNAMED SUBSIDIARIES

The following is added to **SECTION II – WHO IS AN INSURED**:

Any of your subsidiaries, other than a partnership, joint venture or limited liability company, that is not shown as a Named Insured in the Declarations is a Named Insured if:

a. You are the sole owner of, or maintain an ownership interest of more than 50% in, such subsidiary on the first day of the policy period; and

b. Such subsidiary is not an insured under similar other insurance.

No such subsidiary is an insured for "bodily injury" or "property damage" that occurred, or "personal and advertising injury" caused by an offense committed:

a. Before you maintained an ownership interest of more than 50% in such subsidiary; or

b. After the date, if any, during the policy period that you no longer maintain an ownership interest of more than 50% in such subsidiary.

For purposes of Paragraph **1.** of Section II – Who Is An Insured, each such subsidiary will be deemed to be designated in the Declarations as:

a. An organization other than a partnership, joint venture or limited liability company; or

b. A trust;

as indicated in its name or the documents that govern its structure.

B. BLANKET ADDITIONAL INSURED – GOVERNMENTAL ENTITIES – PERMITS OR AUTHORIZATIONS RELATING TO OPERATIONS

The following is added to **SECTION II – WHO IS AN INSURED**:

Any governmental entity that has issued a permit or authorization with respect to operations performed by you or on your behalf and that you are required by any ordinance, law, building code or written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" arising out of such operations.

The insurance provided to such governmental entity does not apply to:

a. Any "bodily injury", "property damage" or "personal and advertising injury" arising out of operations performed for the governmental entity; or

b. Any "bodily injury" or "property damage" included in the "products-completed operations hazard".

© 2017 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc., with its permission.

C. INCIDENTAL MEDICAL MALPRACTICE

1. The following replaces Paragraph **b.** of the definition of "occurrence" in the **DEFINITIONS** Section:

   b. An act or omission committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to a person, unless you are in the business or occupation of providing professional health care services.

2. The following replaces the last paragraph of Paragraph **2.a.(1)** of **SECTION II – WHO IS AN INSURED**:

   Unless you are in the business or occupation of providing professional health care services, Paragraphs **(1)(a)**, **(b)**, **(c)** and **(d)** above do not apply to "bodily injury" arising out of providing or failing to provide:

   (a) "Incidental medical services" by any of your "employees" who is a nurse, nurse assistant, emergency medical technician or paramedic; or

   (b) First aid or "Good Samaritan services" by any of your "employees" or "volunteer workers", other than an employed or volunteer doctor. Any such "employees" or "volunteer workers" providing or failing to provide first aid or "Good Samaritan services" during their work hours for you will be deemed to be acting within the scope of their employment by you or performing duties related to the conduct of your business.

3. The following replaces the last sentence of Paragraph **5.** of **SECTION III – LIMITS OF INSURANCE**:

   For the purposes of determining the applicable Each Occurrence Limit, all related acts or omissions committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to any one person will be deemed to be one "occurrence".

4. The following exclusion is added to Paragraph **2., Exclusions**, of **SECTION I – COVERAGES – COVERAGE A – BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

   Sale Of Pharmaceuticals

   "Bodily injury" or "property damage" arising out of the violation of a penal statute or ordinance relating to the sale of pharmaceuticals committed by, or with the knowledge or consent of, the insured.

5. The following is added to the **DEFINITIONS** Section:

   "Incidental medical services" means:

   a. Medical, surgical, dental, laboratory, x-ray or nursing service or treatment, advice or instruction, or the related furnishing of food or beverages; or

   b. The furnishing or dispensing of drugs or medical, dental, or surgical supplies or appliances.

6. The following is added to Paragraph **4.b., Excess Insurance**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

   This insurance is excess over any valid and collectible other insurance, whether primary, excess, contingent or on any other basis, that is available to any of your "employees" for "bodily injury" that arises out of providing or failing to provide "incidental medical services" to any person to the extent not subject to Paragraph **2.a.(1)** of Section II – Who Is An Insured.

D. BLANKET WAIVER OF SUBROGATION

The following is added to Paragraph **8., Transfer Of Rights Of Recovery Against Others To Us**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

If the insured has agreed in a contract or agreement to waive that insured's right of recovery against any person or organization, we waive our right of recovery against such person or organization, but only for payments we make because of:

a. "Bodily injury" or "property damage" that occurs; or

b. "Personal and advertising injury" caused by an offense that is committed;

subsequent to the execution of the contract or agreement.

E. CONTRACTUAL LIABILITY – RAILROADS

1. The following replaces Paragraph **c.** of the definition of "insured contract" in the **DEFINITIONS** Section:

   c. Any easement or license agreement;

© 2017 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc., with its permission.

2. Paragraph **f.(1)** of the definition of "insured contract" in the **DEFINITIONS** Section is deleted.

F. DAMAGE TO PREMISES RENTED TO YOU

The following replaces the definition of "premises damage" in the **DEFINITIONS** Section:

"Premises damage" means "property damage" to:

a. Any premises while rented to you or temporarily occupied by you with permission of the owner; or

b. The contents of any premises while such premises is rented to you, if you rent such premises for a period of seven or fewer consecutive days.

© 2017 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc., with its permission.

POLICY NUMBER:DT22-CO-4W090069-TCT-25

COMMERCIAL GENERAL LIABILITY
ISSUE DATE: 04/01/2025

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

DESIGNATED PROJECT(S) GENERAL AGGREGATE LIMIT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Designated Project(s):	Designated Project General Aggregate(s):
EACH "PROJECT" FOR WHICH YOU HAVE AGREED, IN A WRITTEN CONTRACT WHICH IS IN EFFECT DURING THIS POLICY PERIOD, TO PROVIDE A SEPARATE GENERAL AGGREGATE LIMIT, PROVIDED THAT THE CONTRACT IS SIGNED BY YOU BEFORE THE "BODILY INJURY" OR "PROPERTY DAMAGE" OCCURS.	GENERAL AGGREGATE LIMIT SHOWN ON THE DECLARATIONS.

A. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under **COVERAGE A. (SECTION I)**, and for all medical expenses caused by accidents under **COVERAGE C (SECTION I)**, which can be attributed only to operations at a single designated "project" shown in the Schedule above:

1. A separate Designated Project General Aggregate Limit applies to each designated "project", and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations, unless separate **Designated Project General Aggregate(s)** are scheduled above.
2. The Designated Project General Aggregate Limit is the most we will pay for the sum of all damages under **COVERAGE A.**, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under **COVERAGE C**, regardless of the number of:
   a. Insureds;
   b. Claims made or "suits" brought; or
   c. Persons or organizations making claims or bringing "suits".
3. Any payments made under **COVERAGE A.** for damages or under **COVERAGE C.** for medical expenses shall reduce the Designated Project General Aggregate Limit for that designated "project". Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Project General Aggregate Limit for any other designated "project" shown in the Schedule above.
4. The limits shown in the Declarations for **Each Occurrence, Damage To Premises Rented To You and Medical Expense** continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Project General Aggregate Limit.

B. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under **COVERAGE A. (SECTION I)**, and for all medical expenses caused by accidents under **COVERAGE C. (SECTION I)**, which cannot be attributed only to operations at a single designated "project" shown in the Schedule above:

Copyright, The Travelers Indemnity Company, 2004

1. Any payments made under **COVERAGE A.** for damages or under **COVERAGE C.** for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-Completed Operations Aggregate Limit, whichever is applicable; and
2. Such payments shall not reduce any Designated Project General Aggregate Limit.

C. Part **2.** of **SECTION III – LIMITS OF INSURANCE** is deleted and replaced by the following:

2. The General Aggregate Limit is the most we will pay for the sum of:
   a. Damages under **Coverage B**; and
   b. Damages from "occurrences" under **COVERAGE A (SECTION I)** and for all medical expenses caused by accidents under **COVERAGE C (SECTION I)** which cannot be attributed only to operations at a single designated "project" shown in the **SCHEDULE** above.

D. When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-Completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Designated Project General Aggregate Limit.

E. For the purposes of this endorsement the **Definitions Section** is amended by the addition of the following definition:

"Project" means an area away from premises owned by or rented to you at which you are performing operations pursuant to a contract or agreement. For the purposes of determining the applicable aggregate limit of insurance, each "project" that includes premises involving the same or connecting lots, or premises whose connection is interrupted only by a street, roadway, waterway or right-of-way of a railroad shall be considered a single "project".

F. The provisions of **SECTION III – LIMITS OF INSURANCE** not otherwise modified by this endorsement shall continue to apply as stipulated.

Copyright, The Travelers Indemnity Company, 2004

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

LESSOR – ADDITIONAL INSURED AND LOSS PAYEE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

SCHEDULE

Insurance Company: THE TRAVELERS INDEMNITY COMPANY OF CONNECTICUT

Policy Number: 810-4W11312A-25-26-G **Effective Date:** 04/01/2025

Expiration Date: 04/01/2026

Named Insured: TNT INDUSTRIAL CONTRACTORS, INC.

Address: 3800 HAPPY LN
SACRAMENTO CA 95827

Additional Insured (Lessor): SEE SCHEDULE

Address:

Designation Or Description Of "Leased Autos":

ANY AUTO LEASED FOR A PERIOD OF SIX MONTHS OR MORE UNDER A LEASING CONTRACT OR AGREEMENT THAT REQUIRES YOU TO PROVIDE DIRECT PRIMARY INSURANCE FOR THE LESSOR.

Coverages	Limit Of Insurance
Covered Autos Liability	$ 1,000,000 Each "Accident"
Comprehensive	Actual Cash Value Or Cost Of Repair, Whichever Is Less, Minus $ Deductible For Each Covered "Leased Auto"
Collision	Actual Cash Value Or Cost Of Repair, Whichever Is Less, Minus $ Deductible For Each Covered "Leased Auto"
Specified Causes Of Loss	Actual Cash Value Or Cost Of Repair, Whichever Is Less, Minus $ Deductible For Each Covered "Leased Auto"

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

© Insurance Services Office, Inc., 2011

A. Coverage

1. Any "leased auto" designated or described in the Schedule will be considered a covered "auto" you own and not a covered "auto" you hire or borrow.
2. For a "leased auto" designated or described in the Schedule, the **Who Is An Insured** provision under **Covered Autos Liability Coverage** is changed to include as an "insured" the lessor named in the Schedule. However, the lessor is an "insured" only for "bodily injury" or "property damage" resulting from the acts or omissions by:
   a. You;
   b. Any of your "employees" or agents; or
   c. Any person, except the lessor or any "employee" or agent of the lessor, operating a "leased auto" with the permission of any of the above.
3. The coverages provided under this endorsement apply to any "leased auto" described in the Schedule until the expiration date shown in the Schedule, or when the lessor or his or her agent takes possession of the "leased auto", whichever occurs first.

B. Loss Payable Clause

1. We will pay, as interest may appear, you and the lessor named in this endorsement for "loss" to a "leased auto".
2. The insurance covers the interest of the lessor unless the "loss" results from fraudulent acts or omissions on your part.
3. If we make any payment to the lessor, we will obtain his or her rights against any other party.

C. Cancellation

1. If we cancel the policy, we will mail notice to the lessor in accordance with the Cancellation Common Policy Condition.
2. If you cancel the policy, we will mail notice to the lessor.
3. Cancellation ends this agreement.

D. The lessor is not liable for payment of your premiums.

E. Additional Definition

As used in this endorsement:

"Leased auto" means an "auto" leased or rented to you, including any substitute, replacement or extra "auto" needed to meet seasonal or other needs, under a leasing or rental agreement that requires you to provide direct primary insurance for the lessor.

© Insurance Services Office, Inc., 2011

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

LESSOR – ADDITIONAL INSURED AND LOSS PAYEE

Schedule Extension

Additional Insured (Lessor):
ANY LESSOR UNDER A LEASING CONTRACT OR AGREEMENT OF SIX MONTHS OR MORE THAT REQUIRES YOU TO PROVIDE DIRECT PRIMARY INSURANCE FOR THE LESSOR.

© Insurance Services Office, Inc., 2011

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BLANKET ADDITIONAL INSURED – PRIMARY AND NON-CONTRIBUTORY WITH OTHER INSURANCE – CONTRACTORS

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

PROVISIONS

1. The following is added to Paragraph **c.** in **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   This includes any person or organization who you are required under a written contract or agreement, that is signed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, to name as an additional insured for Covered Autos Liability Coverage, but only for damages to which this insurance applies and only to the extent of that person's or organization's liability for the conduct of another "insured".

2. The following is added to Paragraph **B.5., Other Insurance** of **SECTION IV – BUSINESS AUTO CONDITIONS**:

   Regardless of the provisions of paragraph **a.** and paragraph **d.** of this part **5. Other Insurance**, this insurance is primary to and non-contributory with applicable other insurance under which an additional insured person or organization is a named insured when a written contract or agreement with you, that is signed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, requires this insurance to be primary and non-contributory.

© 2016 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

POLICY NUMBER: 8104W11312A2526G

COMMERCIAL AUTO
ISSUE DATE: 04/01/2025

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

SHORT TERM HIRED AUTO – ADDITIONAL INSURED AND LOSS PAYEE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

SCHEDULE

Additional Insured (Lessor):

Any lessor of a "leased auto" under a leasing or rental agreement of less than 6 months.

Designation Or Description Of "Leased Autos":

Any "leased auto" under a leasing or rental agreement of less than 6 months.

A. Coverage

1. Any "leased auto" designated or described in the Schedule will be considered a covered "auto" you own and not a covered "auto" you hire or borrow for **Covered Autos Liability Coverage.**
2. For a "leased auto" designated or described in the Schedule, the **Who Is An Insured** provision under **Covered Autos Liability Coverage** is changed to include as an "insured" the lessor of such "leased auto". However, the lessor is an "insured" only for "bodily injury" or "property damage" resulting from the acts or omissions by:
   a. You;
   b. Any of your "employees" or agents; or
   c. Any person, except the lessor or any "employee" or agent of the lessor, operating a "leased auto" with the permission of any of the above.
3. Coverage for any "leased auto" described in the Schedule applies until the end of the policy period shown in the Declarations or when the lessor or his or her agent takes possession of the "leased auto", whichever occurs first.

B. Loss Payable Clause

1. We will pay, as interest may appear, you and the lessor, if your policy includes Hired Auto Physical Damage Coverage, for "loss" to a "leased auto".
2. The insurance covers the interest of the lessor unless the "loss" results from fraudulent acts or omissions on your part.
3. If we make any payment to the lessor, we will obtain his or her rights against any other party.

© 2015 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

C. The lessor is not liable for payment of your premiums.

D. **Additional Definition**

As used in this endorsement:

"Leased auto" means an "auto" leased or rented to you, including any substitute, replacement or extra "auto" needed to meet seasonal or other needs, under a leasing or rental agreement that requires you to provide direct primary insurance for the lessor.

© 2015 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

POLICY NUMBER: 810-4W11312A-25-26-G

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BUSINESS AUTO EXTENSION ENDORSEMENT

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to the Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

A. **BROAD FORM NAMED INSURED**

B. **BLANKET ADDITIONAL INSURED**

C. **EMPLOYEE HIRED AUTO**

D. **EMPLOYEES AS INSURED**

E. **SUPPLEMENTARY PAYMENTS – INCREASED LIMITS**

F. **HIRED AUTO – LIMITED WORLDWIDE COVERAGE – INDEMNITY BASIS**

G. **WAIVER OF DEDUCTIBLE – GLASS**

H. **HIRED AUTO PHYSICAL DAMAGE – LOSS OF USE – INCREASED LIMIT**

I. **PHYSICAL DAMAGE – TRANSPORTATION EXPENSES – INCREASED LIMIT**

J. **PERSONAL PROPERTY**

K. **AIRBAGS**

L. **NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS**

M. **BLANKET WAIVER OF SUBROGATION**

N. **UNINTENTIONAL ERRORS OR OMISSIONS**

PROVISIONS

A. BROAD FORM NAMED INSURED

The following is added to Paragraph **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any organization you newly acquire or form during the policy period over which you maintain 50% or more ownership interest and that is not separately insured for Business Auto Coverage. Coverage under this provision is afforded only until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier.

B. BLANKET ADDITIONAL INSURED

The following is added to Paragraph **c.** in **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any person or organization who is required under a written contract or agreement between you and that person or organization, that is signed and executed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, to be named as an additional insured is an "insured" for Covered Autos Liability Coverage, but only for damages to which this insurance applies and only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Section II.

C. EMPLOYEE HIRED AUTO

1. The following is added to Paragraph **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   An "employee" of yours is an "insured" while operating an "auto" hired or rented under a contract or agreement in an "employee's" name, with your permission, while performing duties related to the conduct of your business.

2. The following replaces Paragraph **b.** in **B.5., Other Insurance**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

   b. For Hired Auto Physical Damage Coverage, the following are deemed to be covered "autos" you own:

   (1) Any covered "auto" you lease, hire, rent or borrow; and

   (2) Any covered "auto" hired or rented by your "employee" under a contract in an "employee's" name, with your

© 2015 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

permission, while performing duties related to the conduct of your business.

However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto".

D. EMPLOYEES AS INSURED

The following is added to Paragraph **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any "employee" of yours is an "insured" while using a covered "auto" you don't own, hire or borrow in your business or your personal affairs.

E. SUPPLEMENTARY PAYMENTS – INCREASED LIMITS

1. The following replaces Paragraph **A.2.a.(2)**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   (2) Up to $3,000 for cost of bail bonds (including bonds for related traffic law violations) required because of an "accident" we cover. We do not have to furnish these bonds.

2. The following replaces Paragraph **A.2.a.(4)**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   (4) All reasonable expenses incurred by the "insured" at our request, including actual loss of earnings up to $500 a day because of time off from work.

F. HIRED AUTO – LIMITED WORLDWIDE COVERAGE – INDEMNITY BASIS

The following replaces Subparagraph **(5)** in Paragraph **B.7., Policy Period, Coverage Territory**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

(5) Anywhere in the world, except any country or jurisdiction while any trade sanction, embargo, or similar regulation imposed by the United States of America applies to and prohibits the transaction of business with or within such country or jurisdiction, for Covered Autos Liability Coverage for any covered "auto" that you lease, hire, rent or borrow without a driver for a period of 30 days or less and that is not an "auto" you lease, hire, rent or borrow from any of your "employees", partners (if you are a partnership), members (if you are a limited liability company) or members of their households.

(a) With respect to any claim made or "suit" brought outside the United States of America, the territories and possessions of the United States of America, Puerto Rico and Canada:

(i) You must arrange to defend the "insured" against, and investigate or settle any such claim or "suit" and keep us advised of all proceedings and actions.

(ii) Neither you nor any other involved "insured" will make any settlement without our consent.

(iii) We may, at our discretion, participate in defending the "insured" against, or in the settlement of, any claim or "suit".

(iv) We will reimburse the "insured" for sums that the "insured" legally must pay as damages because of "bodily injury" or "property damage" to which this insurance applies, that the "insured" pays with our consent, but only up to the limit described in Paragraph **C.**, Limits Of Insurance, of SECTION II – COVERED AUTOS LIABILITY COVERAGE.

(v) We will reimburse the "insured" for the reasonable expenses incurred with our consent for your investigation of such claims and your defense of the "insured" against any such "suit", but only up to and included within the limit described in Paragraph **C.**, Limits Of Insurance, of SECTION II – COVERED AUTOS LIABILITY COVERAGE, and not in addition to such limit. Our duty to make such payments ends when we have used up the applicable limit of insurance in payments for damages, settlements or defense expenses.

(b) This insurance is excess over any valid and collectible other insurance available to the "insured" whether primary, excess, contingent or on any other basis.

(c) This insurance is not a substitute for required or compulsory insurance in any country outside the United States, its territories and possessions, Puerto Rico and Canada.

© 2015 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

You agree to maintain all required or compulsory insurance in any such country up to the minimum limits required by local law. Your failure to comply with compulsory insurance requirements will not invalidate the coverage afforded by this policy, but we will only be liable to the same extent we would have been liable had you complied with the compulsory insurance requirements.

(d) It is understood that we are not an admitted or authorized insurer outside the United States of America, its territories and possessions, Puerto Rico and Canada. We assume no responsibility for the furnishing of certificates of insurance, or for compliance in any way with the laws of other countries relating to insurance.

G. WAIVER OF DEDUCTIBLE – GLASS

The following is added to Paragraph **D., Deductible**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

No deductible for a covered "auto" will apply to glass damage if the glass is repaired rather than replaced.

H. HIRED AUTO PHYSICAL DAMAGE – LOSS OF USE – INCREASED LIMIT

The following replaces the last sentence of Paragraph **A.4.b., Loss Of Use Expenses**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

However, the most we will pay for any expenses for loss of use is $65 per day, to a maximum of $750 for any one "accident".

I. PHYSICAL DAMAGE – TRANSPORTATION EXPENSES – INCREASED LIMIT

The following replaces the first sentence in Paragraph **A.4.a., Transportation Expenses**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

We will pay up to $50 per day to a maximum of $1,500 for temporary transportation expense incurred by you because of the total theft of a covered "auto" of the private passenger type.

J. PERSONAL PROPERTY

The following is added to Paragraph **A.4., Coverage Extensions**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

Personal Property

We will pay up to $400 for "loss" to wearing apparel and other personal property which is:

(1) Owned by an "insured"; and

(2) In or on your covered "auto".

This coverage applies only in the event of a total theft of your covered "auto".

No deductibles apply to this Personal Property coverage.

K. AIRBAGS

The following is added to Paragraph **B.3., Exclusions**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

Exclusion **3.a.** does not apply to "loss" to one or more airbags in a covered "auto" you own that inflate due to a cause other than a cause of "loss" set forth in Paragraphs **A.1.b.** and **A.1.c.**, but only:

a. If that "auto" is a covered "auto" for Comprehensive Coverage under this policy;

b. The airbags are not covered under any warranty; and

c. The airbags were not intentionally inflated.

We will pay up to a maximum of $1,000 for any one "loss".

L. NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS

The following is added to Paragraph **A.2.a.**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

Your duty to give us or our authorized representative prompt notice of the "accident" or "loss" applies only when the "accident" or "loss" is known to:

(a) You (if you are an individual);

(b) A partner (if you are a partnership);

(c) A member (if you are a limited liability company);

(d) An executive officer, director or insurance manager (if you are a corporation or other organization); or

(e) Any "employee" authorized by you to give notice of the "accident" or "loss".

M. BLANKET WAIVER OF SUBROGATION

The following replaces Paragraph **A.5., Transfer Of Rights Of Recovery Against Others To Us**, of **SECTION IV – BUSINESS AUTO CONDITIONS** :

5. Transfer Of Rights Of Recovery Against Others To Us

We waive any right of recovery we may have against any person or organization to the extent required of you by a written contract signed and executed prior to any "accident" or "loss", provided that the "accident" or "loss" arises out of operations contemplated by

© 2015 The Travelers Indemnity Company. All rights reserved.
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

such contract. The waiver applies only to the person or organization designated in such contract.

N. UNINTENTIONAL ERRORS OR OMISSIONS

The following is added to Paragraph **B.2., Concealment, Misrepresentation, Or Fraud**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

The unintentional omission of, or unintentional error in, any information given by you shall not prejudice your rights under this insurance. However this provision does not affect our right to collect additional premium or exercise our right of cancellation or non-renewal.

© 2015 The Travelers Indemnity Compa ny. All rights reserved .
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

TRAVELERS

WORKERS COMPENSATION
AND
EMPLOYERS LIABILITY POLICY

ENDORSEMENT WC 99 03 76 (A) –

POLICY NUMBER: UB1Y3167782526G

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT – CALIFORNIA (BLANKET WAIVER)

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule.

The additional premium for this endorsement shall be % of the California workers' compensation premium.

Schedule

Person or Organization	**Job Description**
ANY PERSON / ORG WHEN REQUIRED BY WRITTEN CONTRACT	ALL OPERATIONS

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.

(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement Effective : 04/01/2025

Insured: TNT Industrial Contractors, Inc Policy No. UB1Y3167782426G Endorsement No.
Premium

Insurance Company: TRAVELERS PROPERTY CASUALTY COMPANY OF AMERIC

Countersigned by _____

DATE OF ISSUE: 04-01-25 **ST**
ASSIGN:

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BLANKET LOSS PAYEES

This endorsement modifies insurance provided under the

COMMERCIAL INLAND MARINE COVERAGE PART

The following is added to Section E – ADDITIONAL COVERAGE CONDITIONS:

Loss Payable Provision

In the event of a Covered Cause of Loss to Covered Property in which both you and a Loss Payee share an insurable interest, we will:

a. Adjust the loss or damage with you; and

b. Pay any claim for loss or damage jointly to you and the Loss Payee as your interests may appear.

This endorsement applies to all Covered Property for which a Loss Payee is on file with us or your insurance agent or insurance broker.

© 2021 The Travelers Indemnity Company
Includes copyrighted material of Insurance Services Office, Inc. with its permission.

Form **W-9**
(Rev. March 2024)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give form to the requester. Do not send to the IRS.

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See *Specific Instructions* on page 3.

1 Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)

TNT INDUSTRIAL CONTRACTORS, INC.

2 Business name/disregarded entity name, if different from above.

3a Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor ☐ C corporation ☑ S corporation ☐ Partnership ☐ Trust/estate

☐ LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) _____

Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) _____

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any) _____

(Applies to accounts maintained outside the United States.)

3b If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions ☐

5 Address (number, street, and apt. or suite no.). See instructions.

3800 HAPPY LANE

Requester's name and address (optional)

6 City, state, and ZIP code

SACRAMENTO, CA 95827

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

6	8	–	0	2	4	8	7	6	0

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here | **Signature of U.S. person** Paula Mattos | **Date** 2/27/26

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

TAXABLE YEAR

CALIFORNIA FORM

2026 Withholding Exemption Certificate 590

The payee completes this form and submits it to the withholding agent. The withholding agent keeps this form with their records.

Withholding Agent Information

Name

Payee Information

Name	☐ SSN or ITIN ☑ FEIN ☐ CA Corp no. ☐ CA SOS file no.
TNT INDUSTRIAL CONTRACTORS, INC.	68-0248760

Address (apt./ste., room)

3800 HAPPY LANE

City (if you have a foreign address, see instructions.)	State	ZIP code
SACRAMENTO	CA	95827

Exemption Reason

Check only one box.

By checking the appropriate box below, the payee certifies the reason for the exemption from the California income tax withholding requirements on payment(s) made to the entity or individual.

☐ **Individuals — Certification of Residency:**
I am a resident of California and I reside at the address shown above. If I become a nonresident at any time, I will promptly notify the withholding agent. See instructions for General Information D, Definitions.

☑ **Corporations:**
The corporation has a permanent place of business in California at the address shown above or is qualified through the California Secretary of State (SOS) to do business in California. The corporation will file a California tax return. If this corporation ceases to have a permanent place of business in California or ceases to do any of the above, I will promptly notify the withholding agent. See instructions for General Information D, Definitions.

☐ **Partnerships or Limited Liability Companies (LLCs):**
The partnership or LLC has a permanent place of business in California at the address shown above or is registered with the California SOS, and is subject to the laws of California. The partnership or LLC will file a California tax return. If the partnership or LLC ceases to do any of the above, I will promptly inform the withholding agent. For withholding purposes, a limited liability partnership (LLP) is treated like any other partnership.

☐ **Tax-Exempt Entities:**
The entity is exempt from tax under California Revenue and Taxation Code (R&TC) Section 23701 _____ (insert letter) or Internal Revenue Code Section 501(c) _____ (insert number). If this entity ceases to be exempt from tax, I will promptly notify the withholding agent. Individuals cannot be tax-exempt entities.

☐ **Insurance Companies, Individual Retirement Arrangements (IRAs), or Qualified Pension/Profit-Sharing Plans:**
The entity is an insurance company, IRA, or a federally qualified pension or profit-sharing plan.

☐ **California Trusts:**
At least one trustee and one noncontingent beneficiary of the above-named trust is a California resident. The trust will file a California fiduciary tax return. If the trustee or noncontingent beneficiary becomes a nonresident at any time, I will promptly notify the withholding agent.

☐ **Estates — Certification of Residency of Deceased Person:**
I am the executor of the above-named person's estate or trust. The decedent was a California resident at the time of death. The estate will file a California fiduciary tax return.

☐ **Nonmilitary Spouse of a Military Servicemember:**
I am a nonmilitary spouse of a military servicemember and I meet the Military Spouse Residency Relief Act (MSRRA) requirements. See instructions for General Information E, MSRRA.

CERTIFICATE OF PAYEE: Payee must complete and sign below.

Our privacy notice can be found in annual tax booklets or online. Go to **ftb.ca.gov/privacy** to learn about our privacy policy statement, or go to **ftb.ca.gov/forms** and search for **1131** to locate FTB 1131 EN-SP, Franchise Tax Board Privacy Notice on Collection. To request this notice by mail, call 800.338.0505 and enter form code **948** when instructed.

Under penalties of perjury, I declare that I have examined the information on this form, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. I further declare under penalties of perjury that if the facts upon which this form are based change, I will promptly notify the withholding agent.

Type or print payee's name and title PAULA MATTOS, CONTROLLER Telephone (916) 395-8400

Payee's signature ▶ Paula Mattos Date 2/27/26

City of SACRAMENTO
Finance Department

BUSINESS OPERATIONS TAX CERTIFICATE

Business Name	**TNT INDUSTRIAL CONTRACTORS, INC.**
Business Address	**3800 HAPPY LN**
Owner	**TNT INDUSTRIAL CONTRACTORS, INC.**
Type of Business	**Contractors - Construction**
Tax Classification	**Gross Receipts**
Expires	**06/30/2026**
Mailing Address	**TNT INDUSTRIAL CONTRACTORS, INC.** **3800 HAPPY LN** **SACRAMENTO, CA 95827-9721**

1041391

CITY OF SACRAMENTO
DEPARTMENT OF FINANCE
MARK OF AUTHENTICATION

1041391

TOTAL PAID:
$1,225.00

THIS STUB MAY BE FOLDED/DETACHED BEFORE POSTING

MUST BE POSTED IN CONSPICUOUS PLACE

This certificate is not to be construed as a business license or imply that the City of Sacramento has investigated, or approves or recommends, the holder of this certificate. Any representation to the contrary is fraudulent. This certificate must be renewed within 30 days of expiration.

Starting January 1, 2021, Assembly Bill 1607 requires the prevention of gender-based discrimination of business establishments. A full notice is available in English or other languages by going to: https://www.dca.ca.gov/publications/

SPECIAL PROVISIONS

City of SACRAMENTO

CITY OF SACRAMENTO
SACRAMENTO, CALIFORNIA

E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT

TECHNICAL SPECIFICATIONS

BID SET SUBMITTAL

VOLUME 1 OF 2

JANUARY 2025

Digitally signed by Mike Dadik
Contact Info: Carollo Engineers, Inc.
Date: 2025.01.07 17:04:34-08'00'

2880 GATEWAY OAKS DRIVE, SUITE 300 ▪ SACRAMENTO, CALIFORNIA 95833 ▪ P 916-565-4888

CITY OF SACRAMENTO

E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT

TABLE OF CONTENTS

VOLUME 1 OF 2

DIVISION 01 – GENERAL REQUIREMENTS

SECTION NO.	TITLE
01_11_00	SUMMARY OF WORK
01_14_00	WORK RESTRICTIONS
01_33_00	SUBMITTAL PROCEDURES
01_35_73	DELEGATED DESIGN PROCEDURES
01_41_00	REGULATORY REQUIREMENTS
01_60_01	PRODUCT REQUIREMENTS
01_78_36	WARRANTIES AND BONDS
01_81_50	DESIGN CRITERIA

DIVISION 05 – METALS

SECTION NO.	TITLE
05_12_00	STRUCTURAL STEEL FRAMING
05_50_00	METAL FABRICATIONS

DIVISION 09 – FINISHES

SECTION NO.	TITLE
09_96_01	HIGH-PERFORMANCE COATINGS

DIVISION 46 – WATER AND WASTEWATER EQUIPMENT

SECTION NO.	TITLE
46_05_10	COMMON WORK RESULTS FOR MECHANICAL EQUIPMENT
46_23_55	GRIT COLLECTOR RAKE ARM

SECTION 01_11_00

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Detailed description of the Work.

1.02 THE WORK

A. The Work consists of:
   1. Construction of FWTP Grit Separator Rake Arm Replacement project including replacement of the existing grit rake arm and coating of center column cage.
   2. Commissioning of the Work.

1.03 LOCATION OF PROJECT

A. The Work is located at City of Sacramento Fairbairn Water Treatment Plant.

END OF SECTION

SECTION 01_14_00

WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Requirements for sequencing and scheduling the Work affected by existing site and facility, work restrictions, and coordination between construction operations and plant operations.

1.02 GENERAL CONSTRAINTS ON WORK AND SCHEDULING OF WORK

A. Plant access for Contractor will be provided at the south gate.

B. Water projects:
   1. The Fairbairn Water Treatment Plant is a source of drinking water for City of Sacramento.
   2. Conduct Work such that the Owner’s ability to meet its customer's demands for treated drinking water shall not be impaired or reduced in terms of the required quantity or quality of treated water. Do not impair the operational capabilities of essential elements of the treatment process or reduce treatment capacity below levels sufficient to meet demands for water throughout the contract time.
   3. The status of the treatment plant shall be defined as “operational” when the plant is capable of meeting the Owner’s customer’s demands for treated drinking water in terms of the required quantity or quality of treated water.

1.03 UTILITIES

A. Provide advance notice to and utilize services of Underground Services Alert (U.S.A.) for location and marking of underground utilities operated by utility agencies other than the Owner.

B. Maintain electrical, telephone, water, gas, sanitary facilities, and other utilities within existing facilities in service. Provide temporary utilities when necessary.

1.04 WORK BY OTHERS

A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.05 SHUTDOWN CONSTRAINTS

A. General shutdown constraints:
   1. Execute the Work while the existing facility is in operation.
   2. Some activities may be accomplished without a shutdown.
   3. Apply to activities of construction regardless of process or work area.

4. Activities that disrupt plant or utilities operations must comply with these shutdown constraints.
5. Organize work to be completed prior to end of December shutdown, defined below.
6. Provide thorough advanced planning, including having required equipment, materials, and labor on hand at time of shutdown.
7. Where required to minimize treatment process interruptions while complying with specified constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices.
8. Final determination of the permitting of shutdowns will be the sole judgment of the Owner.
9. Owner maintains the ability to abort on the day of the scheduled shutdown.
10. Unplanned shutdowns due to emergencies are not specified in this Section.

B. Unit process availability work limitations:
   1. Shutdowns and tie-ins or other activities that disrupt plant operations are prohibited unless approved in writing by the Owner and Engineer.

1.06 WORK RESTRICTIONS

A. Perform site visit and existing condition analysis during first scheduled grit collector shut down. Perform all construction during grit separator scheduled shut down. Confirm scheduled shutdowns with the Owner. Proposed shutdown windows are as follows:
   1. First shut down: February, 2026 through April, 2026
   2. Second shutdown: Owner to notify Contractor specific window in Winter of 2026

END OF SECTION

SECTION 01_33_00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Requirements and procedures for Submittals to confirm compliance with the Contract Documents.

1.02 GENERAL INSTRUCTIONS

A. Contractor is responsible to determine and verify field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and check and coordinate each item with other applicable approved Shop Drawings and Contract Document requirements.

B. Provide Submittals:
   1. That are specified or reasonably required for construction, operation, and maintenance of the Work.
   2. That demonstrate compliance with the Contract Documents.

C. Where multiple Submittals are required, provide a separate Submittal for each Specification section.
   1. In order to expedite construction, the Contractor may make more than one Submittal per Specification section, but a single Submittal may not cover more than one Specification section:
      a. The only exception to this requirement is when one Specification section covers the requirements for a component of equipment specified in another section.
      b. For example, circuit breakers are a component of switchgear. The switchgear Submittal must also contain data for the associated circuit breakers, even though they are covered in a different Specification section.

D. Prepare Submittals in the English language. Do not include information in other languages.

E. Present measurements in customary American units (feet, inches, pounds, etc.).

F. Must be clear and legible, and of sufficient size for presentation of information.

G. Page size, other than drawings:
   1. Minimum: 8-1/2 inches by 11 inches.
   2. Maximum: 11 inches by 17 inches.

H. Drawing sheet size:
   1. Maximum: 22 inches by 34 inches.
      a. Minimum plan scale: 1/8 inch equals 1 foot-0 inches.
      b. Minimum font size: 1/8-inch.
   2. 11-inch by 17-inch sheet:
      a. Minimum plan scale: 1/8 inch equals 1 foot-0 inches.
      b. Minimum font size: 1/8-inch.

I. Show dimensions, construction details, wiring diagrams, controls, manufacturers, catalog numbers, and all other pertinent details.

J. Provide Submittal information from only one manufacturer for a specified product. Submittals with multiple manufacturers for one product will be rejected without review.

1.03 SUBMITTAL ORGANIZATION

A. Organize Submittals in exactly the same order as the items are referenced, listed, and/or organized in the Specification section.

B. For Submittals that cover multiple devices used in different areas under the same Specification section, the Submittal for the individual devices must list the area where the device is used.

C. Bookmarks:
   1. Bookmarks shall match the table of contents.
   2. Bookmark each section (tab) and heading.
   3. Drawings: Bookmark at a minimum, each discipline, area designation, or appropriate division.
   4. At file opening, display all levels of bookmarks as expanded.

D. Where applicable (i.e., except for Drawings, figures, etc.), Submittal content shall be electronically searchable utilizing the PDF file as submitted.

E. Thumbnails optimized for fast web viewing.

F. Sequentially number pages within the tabbed sections:
   1. Submittals that are not fully indexed and tabbed with sequentially numbered pages, or are otherwise unacceptable, will be returned without review.

G. Attachments:
   1. Include with each Submittal a copy of the relevant Specification section.
      a. Indicate in the left margin, next to each pertinent paragraph, either compliance with a check (√) or deviation with a consecutive number (1, 2, 3).
      b. Provide a list of all numbered deviations with a clear explanation and reason for the deviation.
   2. Include with each Submittal a copy of the relevant Drawing, including relevant addendum updates.
      a. Indicate either compliance with a check (√) or deviation with a consecutive number (1, 2, 3).

b. Provide a list of all numbered deviations with a clear explanation and reason for the deviation.
c. Provide field dimensions and relationship to adjacent or critical features of the Work or materials.

H. Contractor: Prepare Submittal information in sufficient detail to show compliance with specified requirements.
1. Determine and verify quantities, field dimensions, product dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.
2. Coordinate Submittal with other Submittals and with the requirements of the Contract Documents.
3. Check, verify, and revise Submittals as necessary to bring them into conformance with the Contract Documents and actual field conditions.

I. Contractor: Prepare “Or Equal” Submittal information.
1. Provide standard Submittal requirements.
a. In addition, provide in sufficient detail to show reason for variance from specified product and impacts.
2. Provide reason the specified product is not being provided.
3. Explain the benefits to the Owner for accepting the “Or Equal”.
4. Itemized comparison of the proposed “Or Equal” with product specified, including a list of significant variations:
a. Design features.
b. Design dimensions.
c. Installation requirements.
d. Operations and maintenance requirements.
e. Availability of maintenance services and sources of replacement materials.
5. Reference projects where the product has been successfully used:
a. Name and address of project.
b. Year of installation.
c. Year placed in operation.
d. Name of product installed.
e. Point of contact: Name and phone number.
6. Define impacts:
a. Impacts to other contracts.
b. Impacts to other work or products.
7. Contractor represents the following:
a. Contractor bears the burden of proof of the equivalency of the proposed “Or Equal”.
b. Proposed “Or Equal” is equal or superior to the specified product.
c. Contractor will provide the warranties or bonds that would be provided on the specified product on the proposed “Or Equal”, unless the Owner requires a Special Warranty.
d. Contractor will coordinate installation of accepted “Or Equal” into the Work and will be responsible for the costs to make changes as required to the Work.
e. Contractor waives rights to claim additional costs caused by proposed “Or Equal” which may subsequently become apparent.

J. Contractor: Prepare substitution Submittal information.
    1. Provide standard Submittal requirements.
        a. In addition, provide in sufficient detail to show reason for variance from specified product and impacts.
    2. Provide reason the specified product is not being provided.
    3. Explain the benefits to the Owner for accepting the substitution.
    4. Itemized comparison of the proposed substitution with product specified, including a list of significant variations:
        a. Design features.
        b. Design dimensions.
        c. Installation requirements.
        d. Operations and maintenance requirements.
        e. Availability of maintenance services and sources of replacement materials.
    5. Reference projects where the product has been successfully used:
        a. Name and address of project.
        b. Year of installation.
        c. Year placed in operation.
        d. Name of product installed.
        e. Point of contact: Name and phone number.
    6. Define impacts:
        a. Impacts to Contract Price.
            1) Required license fees or royalties.
            2) Do not include costs under separate contracts.
            3) Do not include Engineer's costs for redesign or revision of the Contract Documents.
        b. Impacts to Contract Time.
        c. Impacts to Contract Scope.
        d. Impacts to other contracts.
        e. Impacts to other work or products.
    7. Contractor represents the following:
        a. Contractor shall pay associated costs for the Engineer to evaluate the substitution.
        b. Contractor bears the burden of proof of the equivalency of the proposed substitution.
        c. Proposed substitution does not change the design intent and will have equal performance to the specified product.
        d. Proposed substitution is equal or superior to the specified product.
        e. Contractor will provide the warranties or bonds that would be provided on the specified product on the proposed substitution, unless the Owner requires a Special Warranty.
        f. Contractor will coordinate installation of accepted substitution into the Work and will be responsible for the costs to make changes as required to the Work.
        g. Contractor waives rights to claim additional costs caused by proposed substitution which may subsequently become apparent.

1.04 SUBMITTAL IDENTIFICATION NUMBERING

A. Number each Submittal using the format defined in the table below:

1.05 SUBMITTALS IN ELECTRONIC MEDIA FORMAT

A. General: Provide all information in PC-compatible format using Windows® operating system as utilized by the Owner and Engineer.

B. Text: Provide text documents and manufacturer's literature in Portable Document Format (PDF).

C. Graphics: Provide graphic Submittals (Drawings, diagrams, figures, etc.) utilizing Portable Document Format (PDF).

1.06 SUBMITTAL PROCEDURE

A. Engineer: Review Submittal and provide response:
   1. Review description:
      a. Engineer will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular Submittal, whether or not a stamp or seal is required by the Contract Documents or Laws and Regulations.
      b. Engineer's review of Submittals shall not release the Contractor from the Contractor's responsibility for performance of requirements of the Contract Documents. Neither shall the Engineer's review release the Contractor from fulfilling purpose of installation nor from the Contractor's liability to replace defective Work.
      c. Engineer's review of Shop Drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in the Contract Documents.
      d. Engineer's review does not extend to:
         1) Accuracy of dimensions, quantities, or performance of equipment and systems designed by the Contractor.
         2) Contractor's means, methods, techniques, sequences, or procedures, except when specified, indicated on the Drawings, or required by the Contract Documents.
         3) Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.
      e. Engineer can Approve or Not Approve any exception at their sole discretion.
   2. Review timeframe:
      a. Except as may be provided in technical Specifications, a Submittal will be returned within 30 days.
      b. When a Submittal cannot be returned within the specified period, Engineer will, within a reasonable time after receipt of the Submittal, give notice of the date by which that Submittal will be returned.
      c. Engineer's acceptance of progress schedule containing Submittal review times less than those specified or agreed to in writing by the Engineer will not constitute Engineer's acceptance of review times.

d. Critical Submittals:
    1) Contractor will notify Engineer in writing that timely review of a Submittal is critical to the progress of Work.

3. Schedule delays:
    a. No adjustment of Contract Times or Contract Price will be allowed due to Engineer's review of Submittals unless all of the following criteria are met:
        1) Engineer has failed to review and return first submission within the agreed upon time frame.
        2) Contractor demonstrates that delay in progress of Work is directly attributable to the Engineer's failure to return Submittal within time indicated and accepted by the Engineer.
4. Review response will be returned to the Contractor with one of the following dispositions:
    a. Approved:
        1) No Exceptions:
            a) There are no notations or comments on the Submittal and the Contractor may release the equipment for production.
        2) Make Corrections Noted - See Comments:
            a) Contractor may proceed with the Work, however, all notations and comments must be incorporated into the final product.
            b) Resubmittal not required.
        3) Make Corrections Noted - Confirm:
            a) Contractor may proceed with the Work, however, all notations and comments must be incorporated into the final product.
            b) Submit confirmation specifically addressing each notation or comment to the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the confirmation.
    b. Not Approved:
        1) Correct and Resubmit:
            a) Contractor may not proceed with the Work described in the Submittal.
            b) Contractor assumes responsibility for proceeding without approval.
            c) Resubmittal of complete Submittal package is required within 30 calendar days of the date of the Engineer's Submittal review response.
        2) Rejected - See Remarks:
            a) Contractor may not proceed with the Work described in the Submittal.
            b) Submittal does not meet the intent of the Contract Documents. Resubmittal of complete Submittal package is required with materials, equipment, methods, etc., that meet the requirements of the Contract Documents.
    c. Receipt Acknowledged:
        1) Filed for Record:
            a) This is used in acknowledging receipt of informational Submittals that address means and methods of construction such as schedules and work plans, conformance test reports, health and safety plans, etc.

2) With Comments - Resubmit:
a) This is used in acknowledging receipt of informational Submittals that address means and methods of construction such as schedules and work plans, conformance test reports, health and safety plans, etc. Feedback regarding missing information, conflicting information, or other information that makes it incomplete can be made with comments.

B. Contractor: Prepare resubmittal, if applicable:
1. Clearly identify each correction or change made. Provide page references to the changed information within the resubmittal.
2. Include a response in writing to each of the Engineer's comments or questions for Submittal packages that are resubmitted in the order that the comments or questions were presented from the first and subsequent Submittals and numbered consistent with the Engineer's numbering.
a. Acceptable responses to the Engineer's comments are listed below:
1) "Incorporated" - Engineer's comment or change is accepted and appropriate changes are made.
2) "Response" - Engineer's comment not incorporated. Explain why comment is not accepted or requested change is not made. Explain how requirement will be satisfied in lieu of comment or change requested by the Engineer.
b. Reviews and resubmittals:
1) Contractor shall provide resubmittals which include responses to all Submittal review comments separately and at a level of detail commensurate with each comment.
2) Contractor responses shall indicate how the Contractor resolved the issue pertaining to each review comment.
a) Responses such as "acknowledged" or "noted" are not acceptable.
3) Resubmittals which do not comply with this requirement may be rejected and returned without review.
4) Contractor shall be allowed no extensions of any kind to any part of their contract due to the rejection of non-compliant Submittals.
5) Submittal review comments not addressed by the Contractor in resubmittals shall continue to apply whether restated or not in subsequent reviews until adequately addressed by the Contractor to the satisfaction of the reviewing and approving authority.
c. Any resubmittal that does not contain responses to the Engineer's previous comments shall be returned for revision and resubmittal. No further review by the Engineer will be performed until a response for previous comments has been received.
3. Resubmittal timeframe:
a. Contractor shall provide resubmittal within 15 days.
b. When a resubmittal cannot be returned within the specified period, Contractor shall notify the Engineer in writing.
4. Review costs:
a. Costs incurred by the Owner as a result of additional reviews of a particular Submittal after the second time it has been reviewed shall be borne by the Contractor.

b. Reimbursement to the Owner will be made by deducting such costs from the Contractor's subsequent progress payments.

1.07 PRODUCT DATA

A. Edit Submittals so that the Submittal specifically applies to only the product furnished.

B. Neatly cross out all extraneous text, options, models, etc., that do not apply to the product being furnished so that the information remaining is only applicable to the product being furnished.

1.08 SHOP DRAWINGS

A. Contractor to field verify elevation, coordinates, and material of structure prior to the preparation of Shop Drawings.

B. Indicate project-designated equipment tag numbers for Submittal of devices, equipment, and assemblies.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ATTACHMENT A - CONTRACTOR SUBMITTAL TRANSMITTAL FORM

CONTRACTOR SUBMITTAL TRANSMITTAL FORM

Owner:	Click here to enter text.	**Date:**	MM/DD/YYYY
Contractor:	Click here to enter text.	**Project No.:**	XXXXX.XX
Project Name:	Click here to enter text.	**Submittal Number:**	000
Submittal Title:	Click here to enter text.		
To:	Click here to enter text.		
From:	Click here to enter text.	Click here to enter text.	
	Click here to enter text.	Click here to enter text.	

Specification No. and Subject of Submittal/Equipment Supplier			
Spec ##:	Spec ##.	**Subject:**	Click here to enter text.
Authored By:	Click here to enter text.	**Date Submitted:**	XX/XX/XXXX

Submittal Certification		
Check Either (A) or (B):		
☐	(A)	We have verified that the equipment or material contained in this Submittal meets all the requirements specified in the project manual or shown on the Contract Drawings with no exceptions.
☐	(B)	We have verified that the equipment or material contained in this Submittal meets all the requirements specified in the project manual or shown on the Contract Drawings, except for the deviations listed.
Certification Statement: By this Submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved Shop Drawings and all Contract requirements.		
General Contractor's Reviewer's Signature:		
Printed Name:		

PM/CM Office Use	
Date Received GC to PM/CM:	
Date Received PM/CM to Reviewer:	
Date Received Reviewer to PM/CM:	
Date Sent PM/CM to GC:	

SECTION 01_35_73

DELEGATED DESIGN PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Delegated Design procedures.

1.02 GENERAL

A. Delegated Design - Professional design services assigned to the Contractor by express delegation in the Contract Documents. Work is “Delegated Design” where the Technical Sections require the Contractor to provide professional design services and to submit signed and sealed documents from a registered Professional Engineer.

B. Contractor’s Professional Engineer - The design professional retained by the Contractor to perform Delegated Design.

C. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents.
   1. Requirements of Delegated Design component as specified in the Technical Section and as indicated on the Drawings.
   2. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that the Contractor must furnish to the Engineer with respect to the Delegated Design.

D. Contractor shall cause such Delegated Design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal shall appear on Drawings, calculations, Specifications, certifications, and Submittals prepared by such design professional.
   1. Contractor shall not be responsible for the adequacy of performance or design criteria specified by the Owner or Engineer.
   2. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.
   3. Such design professional shall issue certifications of design required by Laws and Regulations.
   4. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by the Contractor, a Subcontractor, or others for submittal to the Engineer, then such Shop Drawing or other Submittal shall bear the written approval of Contractor’s design professional when submitted by the Contractor to the Engineer.

E. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under Delegated Design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

F. Engineer's review, approval, and other determinations regarding design drawings, calculations, Specifications, certifications, and other Submittals furnished by Contractor pursuant to a Delegated Design will be only for the following limited purposes:
   1. Confirming that Submittal is in conformance with the performance and design criteria specified in the Contract Documents.

1.03 CONTRACTOR'S PROFESSIONAL ENGINEER

A. Contractor or Subcontractor shall retain a licensed Professional Engineer to perform Delegated Design.

B. Qualifications:
   1. Holding a current license to perform the specified design in the same jurisdiction as the Project Site.
   2. Experienced in designing similar systems of similar complexity.

C. Insurance:
   1. Provide Contractor's Professional Engineer's Professional Liability Insurance.

D. Responsibilities:
   1. Review and design in accordance with system performance and design criteria stated in the Contract Documents.
      a. Prepare written requests for clarifications or interpretations of performance or design criteria for submittal to the Engineer by the Contractor.
   2. Sign and seal design reports, calculations, design drawings and specifications, and other design Submittals for the Delegated Design Work.
   3. Review and submit written approval of Submittals related to the Delegated Design Work.
   4. Design modifications to the Delegated Design Work as required.
   5. Visit the Site, as required, to verify that installation of the Delegated Design Work is in conformance with the Delegated Design Drawings and Specifications.
   6. Submit through Contractor to Engineer written, signed, and sealed certification that the installed Delegated Design Work complies with Contractor's Professional Engineer's design.

1.04 SUBMITTALS

A. Prior to the start of Delegated Design:
   1. Contractor's Professional Engineer's qualifications:
      a. Experience for the Delegated Design.
      b. Evidence of Professional Engineering license.
   2. Contractor's Professional Engineer Professional Liability Insurance certificate.

B. Delegated Design:
   1. Product data:
      a. Details related to the Delegated Design as specified in Technical Sections to completely describe the system.
   2. Design documents with signature and seal from the Contractor's Professional Engineer.
      a. Design documents include, but are not limited to, Drawings, calculations, Specifications, inspection reports, and certifications.
   3. Lists and schedules:
      a. Prepare and submit lists or schedules of items where Delegated Design is required by the Contract Documents.
      b. Group items by location in the Work.
         1) When "Area Numbers" are indicated on the Contract Drawings, group lists in accordance with those "areas."
         2) For work without area numbers, group using logical divisions acceptable to the Engineer.
         3) Group items within each "area" as follows:
            a) Systems.
            b) Components.
            c) Supports.
            d) Anchorage.
            e) Bracing.

C. Construction services:
   1. Contractor's Professional Engineer's comments on Submittals.
   2. Other construction documents, as required.

1.05 ENGINEER RESPONSE TO DELEGATED DESIGN SUBMITTALS

A. Engineer response will be either of the following:
   1. Approved. Make Corrections Noted - See Comments:
      a. Contractor may proceed with the Work; however, all notations and comments must be incorporated into the final product.
      b. Review was for the limited purpose of determining that the document was stamped by a Professional Engineer and that such design is generally consistent with and will not negatively affect the design concept presented in the Contract Documents.
   2. Rejected - See Remarks:
      a. Contractor may not proceed with the Work described in the Submittal.
      b. Submittal does not meet the intent of the Contract Documents.
      c. Resubmittal of complete Submittal package is required with materials, equipment, methods, etc., that meet the requirements of the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01_41_00

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Regulatory authorities and codes.

1.02 AUTHORITIES HAVING JURISDICTION (AHJ)

A. Also referred to as the permitting agency.

B. Building Department: Sacramento, CA.
   1. Submit code compliance documentation.

C. Fire Department: Sacramento.

1.03 APPLICABLE CODES

A. International Code Council (ICC).
   1. Building code:
      a. 2022 California Building Code with ASCE 7-16.
         1) Sacramento City Code.
   2. Electrical code:
      a. 2022 California Electrical Code.
         1) Sacramento City Code.
   3. Energy code:
      a. 2022 California Energy Code.
         1) Sacramento City Code.
   4. Fire code:
      a. 2022 California Fire Code.
         1) Sacramento City Code.
   5. Mechanical code:
      a. 2022 California Mechanical Code.
         1) Sacramento City Code.
   6. Plumbing code:
      a. 2022 California Plumbing Code.
         1) Sacramento City Code.

B. Products in contact with drinking water:
   1. Materials in contact with drinking water: In accordance with NSF 61 and NSF 372.
      a. Certification by an independent ANSI accredited third party, including, but not limited to, NSF International, as being lead free.
   2. Materials in contact with drinking water: In accordance with California Health and Safety Code, Section 116875.

C. California Code of Regulations (CCR), California Building Standards Code, CCR Title 24:
   1. Building code:
      a. California Building Code (CBC), Title 24, Part 2 - 2022.
   2. Electrical code:
      a. California Electrical Code (CEC), Title 24, Part 3 - 2022.
   3. Mechanical code:
      a. California Mechanical Code (CMC), Title 24, Part 4 - 2022.
   4. Plumbing code:
      a. California Plumbing Code (CPC), Title 24, Part 5 - 2022.
   5. Energy code:
      a. California Energy Code (CEC), Title 24, Part 6 - 2022.
   6. Historical building code:
      a. California Historical Building Code (CHBC), Title 24, Part 8 - 2022.
   7. Fire code:
      a. California Fire Code (CFC), Title 24, Part 9 - 2022.
   8. Existing building code:
      a. California Existing Building Code (CEBC), Title 24, Part 10 - 2022.
   9. Green building standards code:
      a. California Green Building Standards Code (CALGreen), Title 24, Part 11 - 2022.

END OF SECTION

SECTION 01_60_01

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Requirements for products.

1.02 TERMINOLOGY

A. The words and terms listed below, are not defined terms that require initial capital letters, but, when this Section is referenced in other Specifications, have the indicated meaning.
   1. Manufacturer's instructions:
      a. Stipulations, directions, and/or recommendations issued by the manufacturer of the product addressing handling, storage, installation, protection, erection, and/or application of the product.
   2. Product data:
      a. Information about the product, typically found in the manufacturer's catalogs specifications or other resources, including data sheets, bulletins, and brochures.

1.03 SHIPMENT

A. Transport products by methods that avoid product damage.

B. Deliver products in undamaged condition in the manufacturer's unopened packaging.

1.04 DELIVERY AND HANDLING

A. Handle products in accordance with the manufacturer's instructions.

B. Deliver products in undamaged condition in the manufacturer's unopened packaging.

C. Provide construction equipment and personnel to handle products by methods in accordance with the manufacturer's instructions.

D. Upon delivery, promptly inspect shipments:
   1. Verify compliance with the Contract Documents, correct quantities, and undamaged condition of products.
   2. Acceptance of shipment does not constitute final acceptance of products.

1.05 STORAGE

A. Immediately store and protect products until installed in the Work.

B. Store products with seals and legible labels intact.

C. Protect painted or coated surfaces against impact, abrasion, discoloration, and damage.

D. Storage of spare parts, maintenance products, special tools.
   1. Immediately store in accordance with the manufacturer's instructions.
   2. Store spare parts, maintenance products, and special tools in an enclosed, weather-proof, and lighted facility during the construction period.
   3. Protect parts subject to deterioration, such as ferrous metal items and electrical components with appropriate lubricants, desiccants, or hermetic sealing.
   4. Store large items individually:
      a. Weight: Greater than 50 pounds.
      b. Size: Greater than 24-inches wide by 18-inches high by 36-inches long.
      c. Clearly labeled:
         1) Equipment tag number.
         2) Equipment manufacturer.
         3) Subassembly component, if appropriate.
   5. Store smaller items in spare parts boxes:
      a. Weight: Less than 50 pounds.
      b. Size: Less than 24-inches wide by 18-inches high by 36-inches long.
      c. Clearly labeled:
         1) Equipment tag number.
         2) Equipment manufacturer.
         3) Subassembly component, if appropriate.
   6. Spare parts and special tools box:
      a. Box material: Waterproof, corrosion resistant.
      b. Hinged cover with locking hasp:
         1) Inventory list taped to underside of cover.
         2) Clearly labeled:
            a) "Spare Parts and/or Special Tools".
            b) Equipment tag number.
            c) Equipment manufacturer.
            d) Subassembly component, if appropriate.

E. Exterior storage of fabricated products:
   1. Place on aboveground supports that allow for drainage.
   2. Cover products subject to deterioration with impervious sheet covering.
   3. Provide ventilation to prevent condensation under covering.

F. Store moisture sensitive products in watertight enclosures.

G. Store loose granular materials on solid surfaces in well-drained area.
   1. Prevent materials mixing with foreign matter.
   2. Provide access for inspection.

H. When needed and approved by the Engineer, offsite storage location shall be within 20 miles of the Project Site.
   1. Provide proof of insurance coverage for products stored offsite.

I. Payment will not be made for products improperly stored or stored without providing the Engineer with the manufacturer's instructions for storage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide products by the same manufacturer when units are of similar nature, unless otherwise specified.

B. Provide like parts of duplicate units that are interchangeable.

C. Provide equipment or products that have not been in service prior to delivery, except as required by tests.

D. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
   1. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

E. Provide products produced by manufacturers regularly engaged in the production of these products.

F. Provide products that bear approvals and labels as specified such as Factory Mutual (FM), Underwriters Laboratory (UL), or National Sanitation Foundation (NSF International) that are acceptable to the Authority Having Jurisdiction.

2.02 MATERIAL

A. Dissimilar metals.

B. Separate contacting surfaces with dielectric material. Isolating sleeves and washers:
   1. Manufacturers: One of the following or equal:
      a. Allied Corrosion Industries.
      b. Central Plastics Co.
   2. Sleeves: Mylar, 1/32-inch thick, 4,000 volts per mil dielectric strength, of proper size to fit bolts and extending half way into both steel washers.
   3. One sleeve required for each bolt.
   4. Washers: Inside diameter of washers shall fit over the isolating sleeve, and both the steel and isolating washers shall have the same inside diameter and outside diameter.
      a. Proper size to fit bolts.
      b. Two 1/8-inch thick steel washers for each bolt.
      c. G3 Phenolic: 2 insulating washers are required for each bolt:
         1) Thickness: 1/8 inch.
         2) Base material: Glass.
         3) Resin: Phenolic.
         4) Water absorption: 2 percent.
         5) Hardness (Rockwell): 100.
         6) Dielectric strength: 450 volts per mil.
         7) Compression strength: 50,000 pounds per square inch.

8) Tensile strength: 20,000 pounds per square inch.
9) Maximum operating temperature: 350 degrees Fahrenheit.

5. Neoprene, bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators, washers, petrolatum tape, or other materials as specified.
6. Dielectric coatings can be used to separate dissimilar metal couples from surrounding environment if isolation of metals is not possible, with approval of the Engineer.

C. Edge grinding:
1. Sharp projections of cut or sheared edges of ferrous metals which are not to be welded shall be ground to a radius required to ensure satisfactory paint adherence and mitigate any safety hazard.
2. A surface profile will need to be re-established for coating adherence based on coating manufacturer's profile requirements.

D. Use anti-galling compound on threads of stainless steel fasteners during factory assembly.

E. Provide anti-galling compound with stainless steel fasteners shipped for field assembly.

F. Aluminum in contact with concrete or masonry: Apply epoxy mastic as specified in Section 09_96_01 - High-Performance Coatings, coating system EPX-M-5.

2.03 PRODUCT SELECTION

A. When products are specified without named manufacturers, provide products that meet or exceed the Specifications.

B. When products are specified with names of manufacturers but no model numbers or catalog designations, provide products by one of the named manufacturers that meet or exceed specifications.

C. When products are specified with names of manufacturers and model numbers or catalog designations, provide products with model numbers or catalog designations by one of the named manufacturers.

D. When products are specified with names of manufacturers, but with brand or trade names, model numbers, or catalog designations by one manufacturer only, provide:
1. Products specified by brand or trade name, model number, or catalog designation.
2. Products by another named manufacturer proven, in accordance with requirements for an "or equal", including the Engineer's approval, to meet or exceed quality, appearance and performance of specified brand or trade name, model number, or catalog designation.

E. When products are specified with only one manufacturer followed by "or equal," provide:
1. Products meeting or exceeding specifications by specified manufacturer.
2. Engineer deemed "or equal" evidenced by an approved Shop Drawing or other written communication.

F. When products are specified by naming 2 or more manufacturers with 1 manufacturer as a “Basis of Design”:
   1. Any of the named manufacturers can be submitted.
   2. If the product submitted is not by the named “Basis of Design” product and requires a change in the scope (dimensions, configuration, physical properties, etc.), schedule (longer lead time), or budget, the Contractor must submit a substitution request.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inspect equipment or products prior to installation.

B. Repaint or recoat damaged painted or coated surfaces after installation.

C. Use anti-galling compound on stainless steel threads used for field assembly.

3.02 PROTECTION AFTER INSTALLATION

A. Provide coverings as necessary to protect installed products from damage due to traffic and subsequent construction operations.
   1. Remove covering when no longer needed.
   2. Replace corroded, damaged, or deteriorated products before acceptance of the Project.

END OF SECTION

SECTION 01_78_36

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Warranty and bonds requirements.

1.02 SUBMITTALS

A. For each item of material or equipment furnished under the Contract:
   1. Submit manufacturer's warranty prior to fabrication and shipment of the item from the manufacturer's facility.
   2. Submit manufacturer's special warranty when specified.

B. Provide consolidated warranties and bonds within 15 calendar days of Substantial Completion.
   1. Contents:
      a. Organize warranty and bond documents:
         1) Include Table of Contents organized by Specification Section number and the name of the product or work item.
      b. Include each required warranty and bond in proper form, with full information, certified by manufacturer as required, and properly executed by Contractor, or subcontractor, supplier, or manufacturer.
      c. Provide name, address, phone number, and point of contact of manufacturer, supplier, and installer, as applicable.
   2. Hardcopy format:
      a. Submit 2 copies.
      b. Assemble in 3 D-side ring binders with durable cover.
      c. Identify each binder on the front and spine with typed or printed title "Warranties and Bonds"; Project Name or Title, and the Name Address and Telephone Number of the Contractor.
   3. Electronic copy in PDF format:
      a. Submit 1 copy.

1.03 OWNER'S RIGHTS

A. Owner reserves the right to reject warranties.

B. Owner reserves the right to refuse to accept Work for the project if the required warranties have not been provided.

1.04 RELATIONSHIP TO GENERAL WARRANTY AND CORRECTION PERIOD

A. Warranties specified for materials and equipment shall be in addition to, and run concurrent with, both Contractor's general warranty and the correction period requirements.

B. Disclaimers and limitations in specific materials and equipment warranties do not limit Contractor’s general warranty, nor does such affect or limit Contractor’s performance obligations under the correction period.

1.05 MANUFACTURER’S 1 YEAR WARRANTY MINIMUM REQUIREMENTS

A. Written warranty issued by item’s manufacturer.

B. Project-specific information, properly executed by product manufacturer, and expressly states that its provisions are for the benefit of the Contractor.

C. Covers all costs associated with the correction of the defect, including, but not limited to, removal of defective parts, new parts, labor, and shipping.

D. Provides a timely response to correct the defect.
   1. Manufacturer shall provide, in a timely fashion, temporary equipment as necessary to replace warranted items requiring repair or replacement, when warranted items are in use and are critical to the treatment process, as defined by Owner.

E. Warranty commence running on the date of substantial completion.
   1. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit warranty within 10 calendar days after acceptance, listing date of acceptance as beginning of warranty period.

F. Duration of warranty: 1 year.

1.06 MANUFACTURER’S SPECIAL WARRANTY

A. Manufacturer’s special warranty is a written warranty published by the manufacturer which includes the requirements as specified in the Technical Section.
   1. Project-specific information and requirements.
   2. Properly executed by product manufacturer.
   3. Expressly states that its provisions are for the benefit of the Contractor or Owner.
   4. Manufacturer’s special warranties commence on the date that the associated item is certified by Engineer as substantially complete.

1.07 WARRANTY WORK

A. Contractor’s responsibilities:
   1. Manufacturer’s disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the product, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.

B. Replacement cost:
   1. Upon determination that work covered by warranty has failed, replace or rebuild the work to an acceptable condition complying with requirement of the Contract Documents.
      a. Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether Owner has benefited from the use of the work through a portion of its anticipated useful service life.

C. Related damages and losses:
   1. When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.

D. Owner's recourse:
   1. Written warranties are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitation on time in which Owner can enforce such other duties, obligations, rights, or remedies.

E. Reinstatement of warranty:
   1. When work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
      a. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

1.08 IMPLIED WARRANTIES

A. Warranty of title and intellectual rights:
   1. Except as may be otherwise indicated in the Contract Documents, implied warranty of title required by Laws and Regulations is applicable to the Work and to materials and equipment incorporated therein.
   2. Provisions on intellectual rights, including patent fees and royalties, are in the General Conditions, as may be modified by the Supplementary Conditions.

B. Implied warranties: Duration in accordance with Laws and Regulations.

1.09 BONDS

A. Equipment bond and other bond requirements as specified in the Technical Sections.

B. Bonds commence running on the date of substantial completion.
   1. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit warranty within 10 calendar days after acceptance, listing date of acceptance as beginning of bond period.

END OF SECTION

SECTION 01_81_50

DESIGN CRITERIA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Design criteria for use in the selection of equipment and appurtenances specified in Technical Sections of these Specifications and indicated on the Drawings.
   2. Criteria for design of systems, components and equipment fabricated off site and shipped to the Work for installation.
   3. Criteria for design of anchors to connect equipment and appurtenances to supports and structures.

B. The criteria in this Section apply throughout the Work, unless additional criteria, or more restrictive criteria, are indicated.
   1. Additional criteria and requirements relevant to specific locations, specific materials, and specific equipment are indicated on the Drawings, and in the Technical Sections.

1.02 REFERENCES

A. American Society of Civil Engineers (ASCE):
   1. 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures. (ASCE 7).

B. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE):
   1. ASHRAE Fundamentals Handbook.

C. International Code Council (ICC):
   1. International Energy Conservation Code (IECC).
   2. International Plumbing Code (IPC).

D. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA):
   1. Seismic Restraint Manual: Guidelines for Mechanical Systems, 3rd edition 2008.

PART 2 PRODUCTS

2.01 DESIGN CRITERIA - SITE INFORMATION

A. Site name: Fairbairn WTP:
   1. Street address: 7501 College Town Dr, Sacramento, CA 95826.
   2. Site elevation (approximate):
      a. 40 feet above mean sea level.

2.02 DESIGN CRITERIA - REGULATORY REQUIREMENTS

A. Requirements of authorities having jurisdiction over the Project are included in Section 01_41_00 - Regulatory Requirements.

2.03 DESIGN CRITERIA - OPERATING ENVIRONMENT

A. Drawings and Technical Sections include additional criteria and requirements relevant to specific locations, materials, and equipment.
   1. Rainfall intensity:
      a. Reference: International Plumbing Code (IPC):
         1) 1.43 inches per hour (200-year, 1-hour rainfall).

2.04 DESIGN CRITERIA - STRUCTURAL

A. General:
   1. Criteria for structural design of:
      a. Equipment at locations subject to seismic events.
      b. Equipment exposed to outdoor environments.
      c. Equipment supports and bracing, and anchorage of such items to building and non-building structures.
      d. Structures provided for the Work through Delegated Design.
      e. Manufactured and prefabricated structures, and anchorage of such structures to foundations or other supporting elements.

B. Delegated Design:
   1. As specified in Section 01_35_73 - Delegated Design Procedures.
   2. Structural engineering design shall be performed by a Structural Engineer licensed in the state of California.

C. Structure risk category:
   1. Develop design loads and provide detailing in accordance with the provisions of ASCE 7 and the building code specified in Section 01_41_00 - Regulatory Requirements, based on the Structure Risk Category III.

D. Seismic loads:
   1. Seismic design parameters: Basic parameters - ASCE 7:
      a. Ground motion MCE_R, 5 percent damped:
         1) Short periods, Ss = 0.524 g.
         2) 1 second period, S_1 = 0.242 g.
      b. Peak ground acceleration, MCE_G:
         1) Peak ground acceleration, PGA = 0.22 g.
      c. Mapped long-period transition period:
         1) TL = 12 seconds.
   2. Structures - General:
      a. Seismic Design Category (SDC): C.
      b. Structure response modification coefficient, R:
         1) In accordance with ASCE 7 and the requirements of the Technical Sections.

3. Structures - Tanks and vessels.
    a. Includes: Tank structures, tank supports, and anchorage to structures or foundations.
    b. Liquid storage structures (e.g., basins and tanks).
        1) Include impulsive and convective (“sloshing”) effects.
        2) Component response modification factor - impulsive effects, Ri: In accordance with ASCE 7, Table 15.4-2.
        3) Component response modification factor - convective effects, Rc = 1.0.
    c. Dry material storage structures (e.g., silos, hoppers):
        1) Include effects of stored materials.
        2) Component response modification factor - impulsive effects, Ri: In accordance with ASCE 7, Table 15.4-2.
4. Non-structural components - General:
    a. Includes:
        1) Mechanical and electrical equipment; anchorage of equipment to structures or supports; design of supports; and anchorage of supports to structures or foundations.
        2) Distribution systems associated with mechanical and electrical equipment such as piping, ductwork, conduits, cable trays, raceways, bus ducts, and similar items; anchorage of such systems to supports and structures; and bracing or such systems.
    b. Seismic design requirements for non-structural components are based on the Seismic Design Category (SDC) of the structure or facility where the equipment is installed.
    c. Design components, component anchorage, and component connections to piping and utilities in accordance with the requirements of ASCE 7, Table 13.2-1.
    d. Component amplification factor (ap), response factor (Rp), and overstrength factor for anchorage to concrete (Ωo):
        1) Mechanical and electrical components and systems: In accordance with ASCE 7, Table 13.6-1, unless otherwise indicated in the Technical Sections for these items.
        2) Architectural components and systems: In accordance with ASCE 7, Table 13.6-1, unless otherwise indicated in the Technical Sections for these items.
    e. Component importance factor, I_p:
        1) Component Importance Factor for Seismic Design, I_p, designate importance factor in accordance with the provisions of ASCE 7, Chapter 13, and submit to the Engineer for review prior to developing calculations and details related to that component.

E. Wind loads:
    1. Design structures and non-structural components that are exposed to wind to withstand design wind loads.
        a. Reduction of wind loads based on shielding effects of surrounding structures or components is not allowed.
        b. Design for wind loading is not required for non-structural components and for non-building structures located inside enclosed buildings.

2. Design parameters:
    a. Basic wind speed:
        1) 100 miles per hour (33 feet, 3 second gust).
    b. Exposure category: C.
    c. Topographic factor, Kzt: 1.0.

F. Rainfall loads:
1. Determine rainfall loads using rainfall intensity specified in this Section and including effects of exposed surface slope, height above surface to discharge elevation, and deflection of ponded surfaces.

G. Operational loads:
1. Loads may include equipment vibration, torque, thermal effects, effects of internal contents (weight and sloshing), surge or “water hammer,” and other load conditions.
2. Design for loads indicated by the equipment manufacturer.
3. Design for loads indicated in the Technical Sections for equipment and appurtenances.

H. Serviceability considerations:
1. Deflection, unless otherwise indicated on the Drawings, or specified:
    a. Beam deflection as fraction of span:
        1) Walkways and platforms: Total load = L/240; live load = L/360.
        2) Equipment supports: L/450.

PART 3 EXECUTION

3.01 GENERAL

A. Design approach and criteria in accordance with:
1. Regulatory requirements, including, but not limited to, the building code specified in Section 01_41_00 - Regulatory Requirements.
2. Reference standards and project-specific design criteria listed in this Section.
3. Specific requirements for individual elements and components of the Work as specified in subsequent Technical Sections.

B. In the event of conflicts between design criteria, contact Engineer for interpretation.

C. Where Owner-Delegated Design is required by the Specifications, prepare and submit designs as specified in Section 01_35_73 - Delegated Design Procedures.

3.02 DELEGATED DESIGN

A. Where Delegated Design is required by the Technical Sections, prepare and submit designs as specified in Section 01_35_73 - Delegated Design Procedures.

B. Calculations:
   1. Where submittal of calculations is required:
      a. Provide complete calculations, including sketches to illustrate the design concepts being evaluated, and details to fully describe proposed construction.
   2. Requirements for seismic design calculations will be waived for the following:
      a. Furniture and storage racks 6 feet in height or less.
      b. Moveable equipment.
      c. Mechanical and electrical equipment and components located in structures designated as Seismic Design Category A or B.
      d. Mechanical and electrical equipment and components located in structures designated as Seismic Design Category C and where the component importance factor, I_p, is equal to 1.0.
   3. Requirements for wind design calculations will be waived for the following:
      a. Equipment and components located inside structures, and away from the effects of wind loads.

C. Shop Drawings:
   1. Describing components and manufacturer's requirements for connections.
      a. Include details for connections of components to structures and supports.
      b. Include details for anchoring bracing to structures where required.

3.03 DESIGN - ANCHORS FOR EQUIPMENT, COMPONENTS, AND BRACING

A. General:
   1. Engineer's approval of anchor designs is required before placement of construction that supports or provides bracing for anchored equipment and components.
      a. Prepare anchor designs after the Engineer's approval of the products and layout, and before placement of concrete or masonry that supports them.
   2. Adjust equipment pad sizes and add additional anchor confinement reinforcing to provide required strength at anchorage points between equipment and pad, and between pad and structure.
   3. Supports and bracing:
      a. Design and install braces and anchors to transfer forces from equipment and components to the lateral force resisting system of the surrounding structure.
      b. Anchor and brace piping, ductwork, and electrical distribution components so that lateral or vertical displacement does not result in damage to or failure of essential architectural, mechanical, or electrical equipment.
         1) Provide supplementary framing where required to transfer forces.
         2) Detail and locate braces and anchors to minimize differential movements between components and structure.

B. Preparation:
   1. Obtain manufacturer's information:
      a. Weight and dimensions of components.
      b. Layout and location of anchors that connect to equipment base plates, sole plates, skids, or pads.
      c. Sizes of holes for anchors that will be provided in equipment bases or support frames.

C. Analysis and design:
   1. Perform and submit calculations to determine anchor designs at locations where equipment and equipment supports are connected to the supporting structure.
      a. Indicate number, size, type, and material for anchors.
   2. In determining forces at locations where equipment is anchored to structures, include effects of:
      a. Equipment self-weight and operating weight.
      b. Location of equipment center of mass.
      c. Forces from equipment operation, including, but not limited to:
         1) Effects of internal contents, including weight and sloshing.
         2) Effects of thrust, surge, and water hammer where specified.
         3) Equipment reactions and operating torque.
         4) Equipment vibration.
         5) Thermal effects from equipment and from distribution systems connected to the equipment (piping, ducts, and electrical).
         6) Other load or displacement inducing conditions.
      d. Forces on equipment from loads specified in this Section.
         1) Include effects of wind, snow, and icing loads where applicable.
         2) Design for load combinations indicated in ASCE 7, unless otherwise specified or indicated on the Drawings.
         3) Seismic and wind loads: For equipment and tanks with weight that varies based on the volume of contained material, determine anchor forces to accommodate the full range of filled, partially filled, and empty conditions.
   3. Determine forces and overturning moments at equipment supports and at locations where supports are anchored to structures.
      a. Indicate shear force and associated axial force at each anchor.
   4. Do not use friction to resist sliding resulting from seismic or wind forces.
      a. Resist sliding only by direct application of sliding loads to fasteners as bearing, shear, tension, or compression forces.
   5. Using combined shears and axial forces at each anchor, design anchors and anchor groups for ductile failure.
      a. Ductile failure: Anchor yield before failure of base material, typically concrete or masonry, at the anchor.
   6. Anchor selection:
      a. Provide anchors type indicated on the Drawings.
      b. Where anchors are not specifically indicated on the Drawings, select in accordance with the following:
         1) Anchors that resist seismic and wind forces:
            a) Cast-in-place forged hex-head anchor bolt.
         2) Anchors loaded in sustained tension:
            a) Cast-in-place forged hex-head anchor bolt.
         3) Anchors for reciprocating, vibrating, and rotating equipment:
            a) Cast-in-place forged hex-head anchor bolt.
      c. Do not use post-installed anchors, mechanical or adhesive, unless:
         1) Post-installed anchors are indicated on the Drawings.
         2) Post-installed are approved by the Engineer prior to placement of the surrounding concrete or masonry.

d. Anchor diameter:
    1) Select diameter so that hole in base plate is not greater than 125 percent of the nominal diameter of the anchor, nor greater than the diameter of the anchor plus 1/4 inch.

7. Determine number, size, layout, and minimum effective embedment for anchors.
    a. Layout includes anchor spacing and required distance(s) from anchor to edge(s) of supporting concrete or masonry.
    b. Anchors in concrete: Design based on minimum specified 28-day compressive strength, f'c, as follows, unless otherwise indicated on the Drawings for the Work area:
        1) Existing concrete in place prior to this Work: f'c = 3,000 pounds per square inch.
8. Prepare Drawings showing construction details of anchor designs.
9. Submit design calculations and Drawings prior to placement of anchors, and of the structural elements to which they will connect.

END OF SECTION

SECTION 05_12_00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Structural steel shapes and plate.
   2. Fasteners and structural hardware:
      a. All thread rods.
      b. All thread rods, high-strength.
      c. High-strength bolts.
   3. Welding.
   4. Bolting.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC):
   1. 303 - Code of Standard Practice for Steel Buildings and Bridges.
   2. 360 - Specification for Structural Steel Buildings.

B. American Iron and Steel Institute (AISI):
   1. Steel and stainless steel alloys (types) as indicated.

C. American Welding Society (AWS):
   1. A5.1 - Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding.
   2. A5.17 - Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding.
   3. A5.20 - Specification for Carbon Steel Electrodes for Flux Cored Arc Welding.
   4. D1.1 - Structural Welding Code - Steel.
   5. D1.6 - Structural Welding Code - Stainless Steel.

D. ASTM International (ASTM):
   1. A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
   2. A36 - Standard Specification for Carbon Structural Steel.
   3. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   4. A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   5. A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
   6. A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
   7. A276 - Standard Specification for Stainless Steel Bars and Shapes.

8. A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
9. A489 - Standard Specification for Carbon Steel Lifting Eyes.
10. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
11. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
12. A563 - Standard Specification for Carbon and Alloy Steel Nuts.
13. A992 - Standard Specification for Structural Steel Shapes.
14. B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
15. F436 - Standard Specification for Hardened Steel Washers.
16. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
17. F594 - Standard Specification for Stainless Steel Nuts.
18. F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
19. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength.
20. F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
21. F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength.

E. Research Council on Structural Connections (RCSC):
   1. Specification for Structural Joints Using High-Strength Bolts (RCSC Specification).

1.03 TERMINOLOGY

A. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section, have the indicated meaning.
   1. Snugtight: At bolted joints, the tightness attained with a few impacts of an impact wrench, or by the full effort of an ironworker using a spud wrench to bring the connected plies into firm contact.
   2. Stainless steel related terms:
      a. Descaling: Removal of heavy, tightly adherent oxide films resulting from hot-forming, heat-treatment, welding, and other high-temperature operations.
      b. Passivation: Chemical treatment of stainless steel with a mild oxidant for the purpose of enhancing the spontaneous formation of the steel's protective passive film.
      c. Pickling: Chemical descaling of stainless steel using aqueous solutions of nitric and hydrofluoric acid, or various proprietary formulations as specified.

1.04 SUBMITTALS

A. Product data:
   1. Welding electrodes for field welds: Electrode manufacturer's data.

2. Compressible-washer-type direct tension indicators: Manufacturer's detailed installation instructions, including:
    a. Requirements for type and frequency of pre-installation verification.
    b. Requirements for coordination with regular washers.
    c. Instructions for assembling and tightening the joint so that work progresses from the most rigid part until the connected plies are in firm contact.
3. Stainless steel: Fabricator name and qualifications, member dimensions and structural section properties, and specifications and procedures used for pickling and passivating members.

B. Shop Drawings:
1. Fabrication and erection drawings.

C. Quality Control Submittals:
1. Welding procedure specifications (WPS) in accordance with AWS D1.1 and D1.6.
    a. Submit WPS for each type of welded joint used, whether prequalified or qualified by testing.
        1) State electrode manufacturer and specific electrodes used.
        2) Indicate required AWS qualification for joint.
    b. Submit WPS with Shop Drawings that indicate those welds.
    c. Submit Procedure Qualification Record (PQR) in accordance with AWS D1.1 and D1.6 for welding procedures qualified by testing.
2. Welder qualifications: For each welding process and position:
    a. Welder's qualification certificates.
    b. Contractor's statement that certificate will be "in effect" at the time(s) welding will be performed based on the "Period of Effectiveness" provisions of AWS D1.1 and D1.6.
3. Steel fabricator's AISC certification.

D. Test reports:
1. Certified copies of mill tests and analyses made in accordance with applicable ASTM standards, or reports from a recognized commercial laboratory, including chemical and tensile properties of each shipment of structural steel or part thereof having common properties.

1.05 QUALITY ASSURANCE

A. Certification:
1. Steel fabricators shall be certified by the AISC or other certification acceptable to the Engineer and the building official having jurisdiction.

B. Welding:
1. Perform welding of structural metals in accordance with AWS D1.1 and D1.6 using welders who have current AWS qualification certificate for the process, position, and joint configuration to be welded.
2. Make welding procedure specifications available at the locations where welding is performed.
3. Notify the Engineer at least 24 hours before starting shop or field welding.
4. Engineer may check materials, equipment, and qualifications of welders.

5. Remove welders performing unsatisfactory Work, or require requalification.
6. Engineer may use gamma ray, magnetic particle, dye penetrant, trepanning, or other aids to visual inspection to examine any part of welds or all welds.
7. Contractor shall bear costs of retests on defective welds.
8. Contractor shall also bear costs in connection with qualifying welders.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packing and shipping: Deliver structural steel free from mill scale, rust, and pitting.

B. Storage and protection: Until erection and painting, protect from weather items not galvanized or protected by a shop coat of paint.

PART 2 PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the Drawings, materials shall be in accordance with the following:

Item	ASTM Standard	Class, Grade, Type, or Alloy Number
Stainless Steel		
Plate, sheet, and strip	A240	Type 304(1) or 316(2)
Bars and shapes	A276	Type 304(1) or 316(2)
(1) Use Type 304L (low-carbon stainless steel) if material will be welded. (2) Use Type 316L (low carbon stainless steel) if material will be welded.		

2.02 FASTENERS AND STRUCTURAL HARDWARE

A. General:
1. Materials: Of domestic manufacture.
2. Where fasteners and hardware are specified to be galvanized, hot-dip galvanize in accordance with ASTM A153 or ASTM F2329, unless otherwise specified.

B. Stainless steel bolts (for use in stainless steel structures):
1. General:
   a. Bolts and nuts shall be the products of a single manufacturer/fabricator to ensure proper fit without galling. Ship bolts with properly fitting nuts attached.
   b. Units descaled, pickled and passivated as specified in the Fabrication article in this Section.
2. Type 316:
   a. Bolts: ASTM F593, Group 2, Condition CW, coarse threads.
   b. Nuts: ASTM F594. Match alloy (group and UNS designation) and threads of bolts.
   c. Washers: Type 316 stainless steel.

2.03 ISOLATING SLEEVES AND WASHERS

A. Manufacturers: One of the following or equal:
   1. Allied Corrosion Industries.
   2. Central Plastics Co.

B. Sleeves: Mylar, 1/32-inch thick, 4,000 volts per mil dielectric strength, of proper size to fit bolts and extending half way into both steel washers.

C. One sleeve required for each bolt.

D. Washers: Inside diameter of washers shall fit over the isolating sleeve, and both the steel and isolating washers shall have the same inside diameter and outside diameter.
   1. Proper size to fit bolts.
   2. Two 1/8-inch thick steel washers for each bolt.
   3. G3 Phenolic: 2 insulating washers are required for each bolt:
      a. Thickness: 1/8 inch.
      b. Base material: Glass.
      c. Resin: Phenolic.
      d. Water absorption: 2 percent.
      e. Hardness (Rockwell): 100.
      f. Dielectric strength: 450 volts per mil.
      g. Compression strength: 50,000 pounds per square inch.
      h. Tensile strength: 20,000 pounds per square inch.
      i. Maximum operating temperature: 350 degrees Fahrenheit.

2.04 GALVANIZED SURFACE REPAIR

A. Manufacturers: The following or equal:
   1. Jelt, Galvinox.

2.05 THREAD COATING

A. Manufacturers: One of the following or equal:
   1. Bostik, Never-Seez.
   2. Oil Research, Inc., WLR No. 111.

2.06 SUPPLEMENTARY PARTS

A. Furnish as required for complete structural steel erection, whether or not such parts and Work are specified or indicated on the Drawings.

2.07 FABRICATION

A. Shop assembly:
   1. Fabricate structural steel in accordance with AISC 360 and AISC 303 unless otherwise specified or modified by applicable regulatory requirements.
   2. Where anchors, connections, or other details of structural steel are not specifically indicated on the Drawings or specified, their material, size and form shall be equivalent in quality and workmanship to items specified.

3. Round off sharp and hazardous projections and grind smooth.
4. Take measurements necessary to properly fit work in the field. Take responsibility for and be governed by the measurements and proper working out of all the details.
5. Take responsibility for correct fitting of metalwork.
6. Welded connections:
    a. In accordance with AWS requirements for the metals to be welded.
    b. Weld only in accordance with approved welding procedure specifications.
    c. Keep welding procedure specifications readily available for welders and inspectors during fabrication processes.

B. Stainless steel shapes and assemblies:
1. For structural members such as W shapes, S shapes, channels, angles, and similar rolled shapes not available in quantity, size, and type of stainless steel specified or indicated on the Drawings:
    a. Fabricate shapes using laser-fused, full penetration welds between pieces of plate to attain same or higher section modulus and moment of inertia as that of members indicated on the Drawings.
    b. Fabricate shapes from dual grade stainless steel.
    c. Fabricate beams and channels in accordance with ASTM A6 tolerances.
    d. Manufacturers: The following or equal:
        1) Stainless Structural, LLC.
2. Cleaning and passivation:
    a. Following shop fabrication of stainless steel members and bolts, clean and passivate fabrications at point of manufacture.
    b. Finish requirements: Remove free iron, heat tint oxides, weld scale and other impurities, and obtain a bright passive finished surface with no etching, pitting, frosting, or discoloration.
    c. Provide quality control testing to verify effectiveness of cleaning agents and procedures and to confirm that finished surfaces are clean and passivated.
        1) Conduct sample runs using test specimens with proposed cleaning agents and procedures as required to avoid adverse effects on surface finishes and base materials.
    d. Pre-clean, chemically de-scale (pickle), passivate, and final-clean fabrications in accordance with the requirements of ASTM A380.
        1) If degreasing is required before cleaning (pickling) to remove scale or iron oxide, cleaning with citric acid treatments is permissible; however, such treatments shall be followed inorganic cleaners.
        2) Pickle and passivate stainless steel using a nitric acid solution in accordance with ASTM A380, Annex A2, Table A2.1, Part II.
        3) Pickling by citric acid treatment or sulfuric acid treatment is not considered to satisfy the requirements of this Section.
    e. Inspect after cleaning using methods specified for “gross inspection” in ASTM A380.
    f. Improperly or poorly cleaned and passivated materials shall not be shipped and will not be accepted at the Site.

C. Galvanized carbon steel:
   1. Where galvanizing is required, hot-dip structural steel after fabrication in accordance with ASTM A123.
   2. Do not electro-galvanize or mechanically-galvanize unless specified or accepted by the Engineer.
   3. Re-straighten galvanized items that bend or twist during galvanizing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of conditions: Examine Work in place to verify that it is satisfactory to receive the Work of this Section. If unsatisfactory conditions exist, do not begin this Work until such conditions have been corrected.

3.02 ERECTION

A. General:
   1. Fabricate structural and foundry items to true dimensions without warp or twist.
   2. Form welded closures neatly and grind off smooth where weld material interferes with fit or is unsightly.
   3. Install structural items accurately and securely, true to level, plumb, in correct alignment and grade, with all parts bearing or fitting structure or equipment for which intended.
   4. Do not shift out of alignment, re-drill, re-shape, or force fit fabricated items.
   5. Place anchor bolts or other anchoring devices accurately and make surfaces that bear against structural items smooth and level.
   6. Rigidly support and brace structural items needing special alignment to preserve straight, level, even, and smooth lines. Keep structural items braced until concrete, grout, or dry pack mortar has hardened for 48 hours minimum.
   7. Erect structural steel in accordance with AISC 303 unless otherwise specified or modified by applicable regulatory requirements.
   8. Where anchors, connections, and other details of structural steel erection are not specifically indicated on the Drawings or specified, form, locate, and attach with equivalent in quality and workmanship to items specified.
   9. Round off sharp or hazardous projections and grind smooth.
   10. Coat steel items as specified in Section 09_96_01 - High-Performance Coatings.

B. Stainless steel: Take necessary precautions to avoid iron contamination of stainless steel during delivery, storage, and handling.
   1. Segregate stainless steel from iron.
   2. Tools and handling devices.
      a. Do not use iron tools clamps, chokes, working surfaces, or brushes when fabricating, handling, and erecting stainless steel.
      b. Do not use tools that have been contaminated by contact with iron.
      c. Use stainless steel, polymer coated, or wood tools and handling equipment. Do not use tools that have been contaminated by contact with iron or steel.

C. Welding: General:
   1. Make welds full penetration type, unless otherwise indicated on the Drawings.
   2. Remove backing bars and weld tabs after completion of weld. Repair defective welds observed after removal of backing bars and weld tabs.

D. Welding: Carbon steel:
   1. In accordance with AWS D1.1:
      a. Weld ASTM A36 and ASTM A992 structural steel, and ASTM A500 and ASTM A501 structural tubing with electrodes in accordance with AWS A5.1, using E70XX electrodes; AWS A5.17, using F7X-EXXX electrodes; or AWS A5.20, using E7XT-X electrodes.
      b. Field repair cut or otherwise damaged galvanized surfaces to equivalent original condition using a galvanized surface repair.

E. Welding: Stainless steel:
   1. In accordance with AWS D1.6.
   2. Field welding of stainless steel will not be permitted.
   3. Passivation of field-welded surfaces:
      a. Provide cleaning, pickling and passivating as specified in the Fabrication article of this Section. Clean using Derustit stainless steel cleaner, or equal.

F. Interface with other products:
   1. Where steel members and fasteners come in contact with dissimilar metals (aluminum, stainless steel, etc.), separate or isolate the dissimilar metals with isolating sleeves and washers.

G. Fasteners: General:
   1. Install bolts to project 2 threads minimum, but 1/2 inch maximum beyond nut.

H. Fasteners: High-strength carbon steel bolts:
   1. Connections with high-strength bolts shall be in accordance with the RCSC Specification for Structural Joints Using High-Strength Bolts.
   2. Joints: Slip-critical.
      a. Confirm that faying surfaces at connections are free of dirt and other foreign material, have been blast cleaned, and are free of coatings and inadvertent overspray in accordance with the RCSC Specification.
      b. Furnish hardened flat washers in accordance with ASTM F436:
         1) On outer plies with slotted holes.
         2) When one or more plies of the connected material has a yield strength less than 40 ksi.
         3) Under element, nut, or bolt head, turned in tightening.
      c. Install tension indicator washers, placed in accordance with ASTM F959, Figure X1, to confirm adequate tightening of bolts.
      d. Tighten bolts to full pretension.

I. Fasteners: Stainless steel bolts:
   1. Connections shall be snugtight joints unless otherwise indicated on the Drawings.
   2. Prior to installing nuts, coat threads of stainless steel fasteners with thread coating to prevent galling of threads.
   3. Rotate nuts using a slow, smooth action without interruptions. Avoid over-tightening.

END OF SECTION

SECTION 05_50_00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Handrails and guardrails.
   2. Ladders.
   3. Miscellaneous metals.
   4. Associated accessories to the above items.

1.02 REFERENCES

A. Aluminum Association (AA):
   1. DAF-45: Designations from Start to Finish.
      a. M12-C22-A41.

B. American Association of State Highway and Transportation Officials (AASHTO):
   1. Standard Specifications for Highway Bridges.

C. American Welding Society (AWS):
   1. A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

D. ASTM International (ASTM):
   1. A36 - Standard Specification for Carbon Structural Steel.
   2. A48 - Standard Specification for Gray Iron Castings.
   3. A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and Seamless.
   4. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   5. A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels for General Applications.
   6. A276 - Standard Specification for Stainless Steel Bars and Shapes.
   7. A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
   8. A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
   9. A489 - Standard Specification for Carbon Steel Lifting Eyes.
   10. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   11. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
   12. A635 - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

13. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. A992 - Standard Specification for Structural Steel Shapes.
15. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
16. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
17. B308 - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
18. B429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
19. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
20. F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength.

E. Occupational Safety and Health Administration (OSHA).

1.03 TERMINOLOGY

A. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section, have the indicated meaning.
   1. Passivation: Removal of exogenous iron or iron compounds from the surface of a stainless steel by means of chemical dissolution resulting from treatment with an acid solution that removes the surface contamination but does not significantly affect the stainless steel itself.

1.04 SUBMITTALS

A. Product data:
   1. Handrails and guardrails.

B. Shop Drawings:
   1. Handrails and guardrails:
      a. Including details on connection attachments, gates, kick plates, ladders, and angles.
      b. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
      c. Include erection drawings, elevations, and details where applicable.
      d. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Ladders.
   3. Miscellaneous metals.

C. Samples:
   1. Guardrails with specified finishes.

D. Quality Control Submittals:
   1. Design data.

2. Test reports:
    a. Guardrails: 3 copies of certified tests performed by an independent testing laboratory certifying that guardrails meet current state and OSHA strength requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the Drawings, structural and miscellaneous metals in accordance with the standards of the ASTM, including the following:

Item	ASTM Standard No.	Class, Grade Type, or Alloy No.
Stainless Steel		
Plate, sheet, and strip	A240	Type 304* or 316**
Bars and shapes	A276	Type 304* or 316**
Bolts (Type 304)	F593	Group 1 Condition CW
Bolts (Type 316)	F593	Group 2 Condition CW
Aluminum		
Flashing sheet aluminum	B209	Alloy 5005-H14, 0.032 inches minimum thickness
Structural sheet aluminum	B209	Alloy 6061-T6
Structural aluminum	B209, B308	Alloy 6061-T6
Extruded aluminum	B221	Alloy 6063-T42
Notes: * Use Type 304L if material will be welded. ** Use Type 316L if material will be welded.		

1. Stainless steels are designated by type or series defined by ASTM.
2. Where stainless steel is welded, use low-carbon stainless steel.

2.02 MANUFACTURED UNITS

A. Handrails and guardrails:
    1. General:
        a. Design and fabricate assemblies shall be in accordance with current local, state, and OSHA standards and requirements.
        b. Coordinate layout of assemblies and post spacings to avoid conflicts with equipment and equipment operators:
            1) Indicate on the Shop Drawings locations of such equipment.
            2) Highlight locations where railings cannot be made continuous, and obtain the Engineer's directions on how to proceed before fabricating or installing railings.

2. Aluminum handrails and guardrails (nonwelded pipe):
    a. Rails, posts, and fitting-assembly spacers:
        1) In accordance with ASTM B429, 6005, 6063 or 6105, minimum Schedule 40, extruded aluminum pipe of minimum 1.89-inch outside diameter and 0.14-inch wall thickness.
    b. Kick plates: 6061 or 6105 aluminum alloy.
    c. Fastenings and fasteners: As recommended or furnished by the manufacturer.
    d. Other parts: 6063 extruded aluminum, or F214 or F514.0 aluminum castings:
        1) Fabrications: In accordance with ASTM B209 or ASTM B221 extruded bars:
            a) Bases: 6061 or 6063 extruded aluminum alloy.
        2) Plug screws or blind rivets: Type 305 stainless steel.
            a) Other parts: Type 300 series stainless steel.
    e. Finish of aluminum components:
        1) Anodized finish, 0.7 mil thick, applied to exposed surfaces after cutting.
            a) AA DAF-25 Specification M12-C22-A41: Mechanical finish non specular as fabricated, chemical finish-medium matte, anodic coating-clear Class I Architectural.
        2) Pretreat aluminum for cleaning and removing markings before anodizing.
    f. Fabrication and assembly:
        1) Fabricate posts in single, unspliced pipe length.
        2) Perform without welding.
        3) Do not epoxy bond the parts.
        4) Maximum clear opening between assembled railing components as indicated on the Drawings.
    g. Manufacturers: One of the following or equal:
        1) Craneveyor Corp. Enerco Metals, C-V Rail.
        2) Golden Railings, Riveted System.
        3) Moultrie Manufacturing Co., Wesrail.
3. Steel pipe handrails and guardrails:
    a. Schedule 40 black steel pipe with minimum 1.9-inch outside diameter, or larger where indicated on the Drawings.
    b. Fabricate posts in single, unspliced pipe length.
    c. Kick plates: Galvanized steel.
    d. Attachment devices: Provide clip angles and other fasteners necessary for securing handrails and guardrails to other construction as indicated on the Drawings.
    e. Continuously weld joints and grind smooth.
    f. Bend rails to profile indicated on the Drawings, without sharp bends or flat spots. Rails shall be round after bending.
    g. Neatly weld intersection of rails and posts, and grind surfaces smooth.
4. Guardrail gates:
    a. Supplied by the guardrail manufacturer:
        1) Of same material, quality, and workmanship as specified for guardrail system in which they will be installed.
        2) Of design similar to that of handrail or railing system in which they will be installed.

b. Components: Gate frame, stainless steel self-closing device, hinges, gate stops, and durable self-locking type latch. Fabricate components in accordance with OSHA minimum strength requirements.

5. Fastenings and fasteners: As recommended or furnished by the guardrail manufacturer for use with this system.

B. Ladders:
1. General:
a. Type: Safety type in accordance with local, state, and OSHA standards as minimum. Furnish guards for ladder wells.
b. Size: 18 inches wide between side rails of length, size, shape, detail, and location indicated on the Drawings.
2. Stainless Steel ladders:
a. Materials and fabrication:
1) Type 316 stainless steel.
2) Steel with solid rungs fitted into holes drilled in side rails, plug welded both sides. Bracket supports at top, bottom, and intermediate points, maximum 60 inches on center. Space rungs 8 inches from wall surface unless otherwise indicated on the Drawings, prime paint finish.
b. Rungs: Capable of withstanding 1,000-pound load without failure.
c. Fabrication:
1) Welded construction, of size, shape, location, and details as indicated on the Drawings.

C. Miscellaneous aluminum:
1. Fabricate aluminum products, not covered separately in this Section, in accordance with the best practices of the trade and field assemble by riveting or bolting.
2. Do not weld or flame cut.

D. Miscellaneous cast iron:
1. Tough, gray iron, free from cracks, holes, swells, and cold shuts.
2. Quality such that hammer blow will produce indentation on rectangular edge of casting without flaking metal.
3. Before leaving the foundry, clean castings and apply 16-mil dry film thickness coating of coal-tar epoxy, unless otherwise specified or indicated on the Drawings.

E. Miscellaneous stainless steel:
1. Provide miscellaneous stainless steel items not specified in this Section as indicated on the Drawings or specified elsewhere.
a. Fabricate and install in accordance with the best practices of the trade.
2. Cleaning and passivation:
a. Following shop fabrication of stainless steel members, clean and passivate fabrications.
b. Finish requirements: Remove free iron, heat tint oxides, weld scale and other impurities, and obtain a passive finished surface.
c. Provide quality control testing to verify effectiveness of cleaning agents and procedures and to confirm that finished surfaces are clean and passivated.

1) Conduct sample runs using test specimens with proposed cleaning agents and procedures as required to avoid adverse effects on surface finishes and base materials.

d. Pre-clean, chemically descale (pickle), and final clean fabrications in accordance with the requirements of ASTM A380 to remove deposited contaminants before shipping.
   1) Passivation by citric acid treatment is not allowed.
      a) If degreasing is required before cleaning to remove scale or iron oxide, cleaning (pickling) treatments with citric acid are permissible; however, these treatments shall be followed by inorganic cleaners such as nitric-hydrofluoric acid.
   2) Provide acid descaling (pickling) in accordance with Table A1.1 of Annex A1 of ASTM A380.
   3) After pickling, final cleaning of stainless steel shall be in accordance with Part II of Table A2.1 of Annex A2 of ASTM A380.

e. After cleaning, inspect using methods specified for “gross inspection” in ASTM A380.

f. Improperly or poorly cleaned and passivated materials shall not be shipped and will not be accepted at the job site.

F. Miscellaneous structural steel:
   1. Provide miscellaneous structural steel items not specified in this Section as indicated on the Drawings or specified elsewhere.
      a. Fabricate and install in accordance with the best practices of the trade.

G. Isolating sleeves and washers:
   1. As indicated on the Drawings and as specified in Section 05_05_24 - Mechanical Anchoring and Fastening to Concrete and Masonry.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of conditions:
   1. Examine work in place to verify that it is satisfactory to receive the Work of this Section.
   2. If unsatisfactory conditions exist, do not begin this work until such conditions have been corrected.

3.02 INSTALLATION

A. General:
   1. Install products as indicated on the Drawings, and in accordance with Shop Drawings and the manufacturer’s printed instructions, as applicable, except where specified otherwise.
   2. Interface between materials:
      a. Dissimilar metals: Where steel comes in contact with dissimilar metals (aluminum, stainless steel, etc.), separate or isolate the dissimilar metals.
         1) Make application so that the isolating or protective barrier is not visible in the completed construction.

2) Isolating sleeves and washers: As specified in Section 05_05_24 - Mechanical Anchoring and Fastening to Concrete and Masonry.

b. Aluminum in contact with concrete or masonry: Coat aluminum surfaces as specified in Section 09_96_01 - High Performance Coatings.

c. Aluminum in contact with concrete or masonry.

B. Handrails and guardrails:

1. General:

a. Fasten pipe rails to fittings with Series 300 stainless steel pop rivets or flush set screws.

b. Make pipe cuts clean and straight, free of burrs and nicks, and square and accurate for minimum joint-gap.

c. Drill and countersink holes to proper size, as required for a tight flush fit of screws and other component parts.

d. Space attachment brackets as indicated in the manufacturer's instructions.

2. Aluminum pipe handrails and guardrails:

a. During construction, keep exterior surfaces of handrails and guardrails covered with minimum 0.4 millimeters of heat shrink polyethylene film.

b. Do not remove protective film before handrails and guardrails have been accepted by the Engineer or before other work in proximity of handrails and guardrails has been completed.

c. Discontinue handrails and guardrails at lighting fixtures.

d. Provide 1/8-inch diameter weep hole at base of each post.

e. Space posts as indicated on the Drawings.

f. Anchor posts into concrete by grouting posts into formed holes in concrete, into stainless steel sleeves cast in concrete; or bracket mount to face of concrete surfaces as specified and indicated on the Drawings.

g. Space rails as indicated on the Drawings.

h. Make adequate provision for expansion and contraction of kick plates and rails.

1) Make provisions for removable sections where indicated on the Drawings.

i. Make lower rails a single, unspliced length between posts, or continuous.

j. Make top rails continuous whenever possible, and attach single, unspliced lengths to 3 posts minimum.

k. Draw up fasteners tight with hand wrench or screw driver.

l. Space attachment brackets as indicated on the Drawings or in the manufacturer's installation instructions.

m. Completed installation shall have handrails and railings rigid and free of play at joints and attachments.

n. Protect handrail and guardrail finish from scratches, gouges, dents, stains, and other damage.

o. Replace damaged or disfigured handrails and guardrails with new.

p. Shortly before final acceptance of the Work, and after removal of protective polyethylene film, clean handrails and guardrails with mild detergent or with soap and water.

1) After cleaning, thoroughly rinse handrails and guardrails and wipe with soft cloth.

q. Erect guardrail straight, level, plumb, and true to the positions as indicated on the Drawings. Correct deviations from true line of grade, which are visible to the eye.

3. Guardrail gates:
    a. Install gate to be a vertical plane with the guardrail when in the closed position.
    b. Install hinges so that each gate can swing 180 degrees from the closed position to the fully open position.
    c. Install so that the gates swing to the walkway side of the guardrail only.
        1) Install gate stops on the stationary railing posts to prohibit gates from swinging in the wrong direction.
    d. Install gate frames, hinges, stops, and latches in accordance with OSHA minimum strength requirements.

C. Ladders:
1. Secure to supporting surface with bent plate clips providing minimum 8 inches between supporting surface and center of rungs.
2. Where exit from ladder is forward over top rung, extend side rails 3 feet-3 inches minimum above landing, and return the rails with a radius bend to the landing.
3. Where exit from ladder is to side, extend ladder 5 feet-6 inches minimum above landing and rigidly secure at top.
4. Erect rail straight, level, plumb, and true to position indicated on the Drawings:
    a. Correct deviations from true line or grade which are visible to the eye.

D. Stainless steel:
1. Welding:
    a. Passivate field-welded surfaces:
        1) Provide cleaning, pickling and passivating as specified in this Section.
        2) Clean using Derustit stainless steel cleaner, or equal.

END OF SECTION

SECTION 09_96_01

HIGH-PERFORMANCE COATINGS

TABLE OF CONTENTS

PART 1 GENERAL 2

1.01 SUMMARY 2
1.02 REFERENCES 2
1.03 TERMINOLOGY 4
1.04 SUBMITTALS 5
1.05 QUALITY ASSURANCE 7
1.06 DELIVERY, STORAGE, AND HANDLING 9
1.07 PROJECT CONDITIONS 10
1.08 MAINTENANCE 12
1.09 TECHNICAL REPRESENTATIVES' RESPONSIBILITIES 12

PART 2 PRODUCTS 13

2.01 DESIGN AND PERFORMANCE CRITERIA 13
2.02 COATING SYSTEMS IDENTIFICATION 13
2.03 PRODUCTS FOR COATING SYSTEMS 14

PART 3 EXECUTION 14

3.01 GENERAL PROTECTION REQUIREMENTS 14
3.02 GENERAL SURFACE PREPARATION REQUIREMENTS 15
3.03 MECHANICAL AND ELECTRICAL EQUIPMENT PREPARATION 15
3.04 CLEANING OF NEW AND PREVIOUSLY COATED OR NEW SURFACES 16
3.05 BLAST CLEANING 16
3.06 GENERAL PREPARATION REQUIREMENTS FOR METALLIC SURFACES 17
3.07 PREPARATION REQUIREMENTS BY SURFACE TYPE 18
3.08 APPLICATION REQUIREMENTS 19
3.09 COATING SYSTEMS 22
3.10 SURFACES NOT REQUIRING COATING 23
3.11 QUALITY CONTROL 23
3.12 CORRECTIVE MEASURES 24
3.13 CLEANUP 25
3.14 FINAL INSPECTION 25

ATTACHMENT A – SCHEDULE OF SURFACES TO BE COATED

ATTACHMENT B – COATING DETAIL SHEET

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Coatings, including coating systems, surface preparation, application requirements, and quality control requirements.

1.02 REFERENCES

A. Abbreviations:
   1. CMU – Concrete masonry units.
   2. CSA – Coating system applicator. Specialty subcontractor retained by the Contractor to perform surface repairs, surface preparations, and apply coating systems as specified in this Section.
   3. CSM – Coating system manufacturer.
   4. CTR – Coating system manufacturer's technical representative.
   5. DFT – Dry-film thickness. Thickness of cured film, usually expressed in mils (0.001 inch).
   6. VOC – Volatile organic compound. The portion of the coating that is a compound of carbon, is photochemically reactive, and evaporates during drying or curing; expressed in grams per liter (g/l) or pounds per gallon (lb/gal). VOC is determined by EPA Method 24.
   7. WFT – Wet film thickness. Coating thickness as measured immediately after application. Usually expressed in mils (0.001 inch).

B. Standards:
   1. ASTM International (ASTM):
      a. A380 – Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
      b. A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
      c. D16 – Standard Terminology for Paint, Related Coatings, Materials, and Applications.
      d. D2200 – Standard Practice for Use of Pictorial Surface Preparation Standards and Guides for Painting Steel Surfaces.
      e. D3359 – Standard Test Methods for Rating Adhesion by Tape Test.
      f. D3960 – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
      g. D4262 – Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
      h. D4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
      i. D4285 – Standard Test Method for Indicating Oil or Water in Compressed Air.
      j. D4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
      k. D4417 – Standard Test Methods for Field Measurement of Surface Profile of Blast-Cleaned Steel.
      l. D4787 – Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

m. D5162 – Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates.
n. D7234 – Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
o. E337 – Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures).
p. F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
q. F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-situ Probes.

2. International Concrete Repair Institute (ICRI):
   a. 310.2 – Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.
3. NACE International (NACE):
   a. SP0178 – Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
   b. SP0188 – Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
4. National Association of Pipe Fabricators (NAPF):
   a. 500-03 – Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings.
5. NSF International (NSF):
   a. 61 – Drinking Water System Components – Health Effects.
   b. 600 – Health Effects Evaluation and Criteria For Chemicals In Drinking Water.
6. Occupational Safety and Health Administration (OSHA).
7. Society for Protective Coatings (SSPC):
   a. Glossary – SSPC Protective Coatings Glossary.
   b. Guide 6 – Guide for Containing Surface Preparation Debris Generated during Paint Removal Operations.
   c. PA 1 – Shop, Field, and Maintenance Painting of Steel.
   d. PA 2 – Procedure for Determining Conformance to Dry Coating Thickness Requirements.
   e. PA 9 – Measurement of Dry Coating Thickness Using Ultrasonic Gages.
   f. QP 1 – Field Application of Coatings to Complex Industrial and Marine Structures.
   g. QP 3 – Shop Application of Complex Protective Coating Systems.
   h. SP 1 – Solvent Cleaning.
   i. SP 2 – Hand Tool Cleaning.
   j. SP 3 – Power Tool Cleaning.
   k. SP 5 – White Metal Blast Cleaning.
   l. SP 7 – Brush-Off Blast Cleaning.
   m. SP 10 – Near-White Metal Blast Cleaning.
   n. SP 11 – Power Tools Cleaning to Bare Metal.
   o. SP 13 – Surface Preparation of Concrete.
   p. SP 16 – Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
   q. SP VIS 1 – Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.

1.03 TERMINOLOGY

A. Definitions used in this Section are in accordance with definitions referenced in ASTM D16, ASTM D3960, and SSPC Glossary of Definitions.

B. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section, have the indicated meaning.
   1. Abrasive: Material used for blast cleaning, such as sand, grit, or shot.
   2. Abrasive blast cleaning: Cleaning/surface preparation by abrasive propelled at high speed.
   3. Anchor pattern: Profile or texture of prepared surface(s).
   4. Biogenic sulfide corrosion: Corrosion caused by sulfuric acid formed when *Thiobacillus* bacteria metabolizes hydrogen sulfide.
   5. Bug holes: Small cavities resulting when air bubbles are entrapped in the surface of formed concrete during placement and consolidation.
   6. Dew point: Temperature a given air/water vapor mixture starts to condense.
   7. Dry to recoat: Time interval between material application and its ability to receive the next coat.
   8. Dry to touch: Time interval between material application and its ability to tolerate a light touch without coating damage.
   9. Drying time: Time interval between application and material curing.
   10. Exposed surface: Any indoor or outdoor surface not buried or encased.
   11. Feather edging: Reducing coating thickness at its edge to blend with existing surrounding coating.
   12. Ferrous: Cast iron, ductile iron, wrought iron, and all steel alloys, except stainless steel.
   13. Field coat: Application of a surface coating system at the work site.
   14. Finish coat: Final coat in a paint system, including texture, color, smoothness of surface, and other properties affecting appearance.
   15. Hold point: A defined point, specified in this Section, at which Work shall be halted for inspection.
   16. Holiday: A discontinuity, skip, void, or pinhole in coating or coating system film that exposes the substrate.
   17. Honeycomb: Segregated and porous surface of hardened concrete due to insufficient consolidation.
   18. Hydroblast: High or ultra-high-pressure water jet surface preparation.
   19. Immersed/Immersion: A service condition in which substrate is submerged, is immediately above liquids, or is subject to frequent wetting, splashing, or washdown.
   20. Incompatibility: One coating's inability to overlay another coating or surface as evidenced by bleeding, poor bonding, or lifting of old coating; inability of a coating to bond to a substrate.
   21. Laitance: A thin, weak, brittle layer of cement and aggregate fines on a concrete surface.
   22. Mil: 0.001 inch.
   23. Overspray: Dry spray, particularly paint bonded to an unintended surface.
   24. Pinhole: A small diameter discontinuity in a coating or coating system film, created by off gassing from a void in a concrete or masonry substrate causing a void between coats or exposing the substrate. Usually caused by coating application while temperature is rising.

25. Pot life: Time interval after components are mixed and coating can be satisfactorily applied.
26. Prime coat: First full paint coat applied to a surface when using a multicoat system. Primers adhere to a new substrate, protect the substrate, and promote adhesion of subsequent coats of paint. The prime coat on metal surfaces is the first full coat and does not include solvent wash, grease emulsifiers, or other pretreatment applications.
27. Resurfacer/Resurfacing material: A layer of cementitious and/or resin-based material used to fill or otherwise restore surface continuity to worn or damaged concrete surfaces.
28. Shop coat: One or more coats applied in an off-site shop or plant before shipment to work site where field or finishing coat(s) are applied.
29. Stripe coat: A separate brush coat of paint applied to all weld seams, pits, nuts/bolts/washers, and edges. This coat shall not be applied until the previous coats have cured. Once applied, the coat shall be allowed to cure before subsequent coats are applied.
30. System: Protective film with one or more coats applied in a predetermined order, including surface preparation and quality control requirements.
31. Thick film coating system: A coating system applied with a minimum dry film thickness of 25 mils.
32. Touch-up painting: Application of paint on previously painted surfaces to repair marks, scratches, and deteriorated or damaged areas to restore the appearance and performance of the coating.
33. Water blast: An alternative to air abrasive blast cleaning that can be used with or without abrasive injection. Water cleaning at pressures up to 5,000 pounds per square inch is called low-pressure water cleaning or power washing. High-pressure water cleaning uses water pressures between 5,000 and 10,000 pounds per square inch. Water jetting is water blasting with added abrasive at pressures between 10,000 and 25,000 pounds per square inch. Ultra-high-pressure water jetting is water blasting at pressures above 25,000 pounds per square inch.
34. Weld splatter: Beads of non-structural weld metal that adhere to the surrounding surface, removed as part of surface preparation.

1.04 SUBMITTALS

A. As specified in Submittal Procedures, submit the following:
   1. Schedule of proposed coating materials.
   2. Schedule of surfaces to be coated with each coating material.
   3. Dehumidification and heating plan.
   4. Methods for tenting blasting areas and methods to protect existing equipment from dust and debris.
   5. Abrasives and abrasive blast cleaning disposal.
   6. Product data, application, and safety data sheets.
   7. NSF certification of coatings for potable water supply systems, including NSF 600 and/or NSF 61.
   8. Compliance with regulatory requirements:
      a. VOC limitations.
      b. Hazardous lead compounds and polychlorinated biphenyls (removal and disposal methods).
   9. Manufacturer’s standard color samples.

10. Include 8-inch square drawdowns or brushouts of topcoat finish when requested. Identify each sample as to finish, formula, color name and number, sheen name, and gloss units.
11. Affidavits signed by an officer of the CSM's corporation attesting to full compliance of each coating system component with current federal, state, and local air pollution control regulations and requirements.
12. Thick film coating systems (greater than 25 mils):
    a. CSM's detailed written instructions for coating system treatment and graphic details for coating system terminations in coated structures, including pipe penetrations, metal embedments, gate frames, and other terminations encountered.
13. Quality assurance Submittals:
    a. Quality assurance plan.
    b. Qualifications:
        1) Field coating applicator includes:
            a) Provide a minimum of 5 project references where similar coating work has been performed by the company in the past 5 years:
                (1) Name and address of project.
                (2) Year of installation.
                (3) Year placed in operation.
                (4) Point of contact: Name and phone number.
            b) SSPC-QP 1 certified as required.
        2) Shop coating applicator includes:
            a) Provide a minimum of 5 project references where similar coating work has been performed by the company in the past 5 years:
                (1) Name and address of project.
                (2) Year of installation.
                (3) Year placed in operation.
                (4) Point of contact: Name and phone number.
            b) SSPC-QP 3 certified as required.
    c. Field Quality Control:
        1) Provide certification letters from NACE Certified Level 3 Coating Inspector for surface preparation and coating application conformance with these specifications for any field-applied procedures performed as may be applicable to the Project.
        2) Indicate results of applicators furnished tests and inspections, including, but not limited to, ambient environmental conditions, surface cleanliness, surface profile, DFT measurements, holiday testing, etc.
    d. CSA reports:
            a) Written daily quality control inspection reports.
            b) Reports to observe and approve surface preparation of structures to be coated.
            c) Reports to observe and approve coating application procedures.
            d) Reports on visits to plants to observe and approve surface preparation and coating application on shop-coated items.
14. For each substituted coating material "equal" to specified product in the coating tabulation:
    a. List of not less than 5 similar successful material applications:
        1) Project name, location, type of structure, and application dates.
        2) Owner's name, address, and telephone number.

b. Certification that material meets or exceeds specified requirements:
   1) Manufacturer's certification, including technical representative's signature and date of signature.
   2) Independent laboratory's certified test reports.

1.05 QUALITY ASSURANCE

A. Coating inspector:
   1. CSA inspector and/or third-party inspector shall be trained and knowledgeable in the specified coating's application.
   2. Provide calibrated inspection instruments and demonstrate use as required.
   3. Applicator's quality assurance inspector foreman shall oversee all aspects of coating work and shall be NACE Level III certified or an SSPC Protective Coatings Inspector (PCI).
      a. Oversees lesser qualified inspectors and provides them training and guidance for testing and report preparations, provides documentation for all inspection equipment showing calibrations, and verifies the equipment is free from damage and is in proper working condition.

B. Regulatory requirements: Comply with governing agencies' regulations by using coatings in accordance with their VOC limits.
   1. Lead-based coatings are not permitted.
   2. Do not use coal-tar epoxy in contact with drinking water or exposed to ultraviolet radiation.

C. Pre-installation conference:
   1. Coordinate Hold Point schedule.

D. Field samples:
   1. Prepare and coat a minimum 100-square-foot area of each system between corners or limits such as control or construction joints.
   2. Approved field sample may be part of the Work.

E. Obtain approval before coating other surfaces. Use products by the same manufacturer for prime coats, intermediate coats, and finish coats on same surface, unless specified otherwise. Coatings must be compatible with one another and complete a cohesive coating system.

F. CSM services:
   1. CSA shall arrange for CTR to attend pre-installation conferences.
   2. Visit the Project Site periodically to consult on and inspect specified surface preparation and application Hold Points.
   3. Visit coating plants to observe and approve surface preparation procedures and coating application of items to be shop primed and coated.
   4. CTR shall provide written inspection reports.

G. Quality control requirements:
   1. Applicator shall be responsible for the workmanship and quality of the coating system installation.
      a. Inspections by the Owner, Engineer, or CTR will not relieve or limit the CSA's responsibilities.

2. In accordance with this Specification's requirements and the standards referenced in this Section. Changes in the coating system application requirements will be allowed only with the Engineer's written acceptance.
3. Specially trained crews with experience applying the specified coating system coating are required for:
    a. Coating application using plural component spray equipment or other specialty equipment.
    b. Coating with specialty linings for severe service conditions, including floor coatings, and with linings for corrosive headspaces or secondary containment areas.
4. CTR shall specially train personnel for coating systems as specified in Attachment B – Coating Detail Sheets.
    a. CSM shall approve personnel in writing applying the coating system.
5. Do not use contaminated, outdated, diluted materials, and/or materials from previously opened containers.
6. Identify inspection access points used by the Owner's or Engineer's personnel.
7. Provide ventilation, ingress, egress, or other means as necessary for the Owner's or Engineer's personnel to safely access the work areas.
8. Conduct and continually inspect Work so the coating system is installed as specified. CSM shall provide written directions to correct coating work not in accordance with the specifications or is otherwise unacceptable.
9. Provide written daily reports summarizing test data, work progress, surfaces covered, ambient conditions, quality control inspection test findings, and other information pertinent to the coating system application.
    a. Determine relative humidity in accordance with ASTM E337. Confirm other conditions, such as proper protective measures for surfaces not to be coated and safety requirements for personnel.
        1) Measure daily at the shift's beginning and end and at intervals not to exceed 4 hours during the shift.
        2) Determine the acceptability of weather and/or environmental conditions within the structure in accordance with the CSM's requirements.
    b. Monitoring surface preparation: Spot check cleanliness, surface profile, and surface pH testing at least 3 times daily. Check each surface at least once. In accordance with:
        1) ASTM D4262.
        2) ASTM D4263.
        3) ASTM D4417.
        4) ICRI 310.2 requirements.
        5) SSPC surface preparation standards.
    c. Confirm that compressed air used for surface preparation or blow-down cleaning is free of oil and moisture.
    d. Monitor surface preparation daily at the shift's beginning and end and at intervals not to exceed 4 hours during the shift.
    e. Do not apply coatings when environmental conditions are outside of the CSM's published limits.
    f. Monitoring coatings application: Continuously inspect, measure, and record the wet film thickness and general film quality (visual inspection) for runs, sags, pinholes, holidays, etc., during coating.
        1) Perform WFT measurements in accordance with ASTM D4414.

g. Post cure evaluation: Measure and inspect the overall dry film thickness on all surfaces.
    1) Conduct a DFT survey and perform adhesion testing, holiday detection, or cure testing as specified in this Section and/or the CSM's written instructions.
    2) Perform applicable tests in accordance with ASTM D4541, ASTM D4787, ASTM D5162, ASTM D7234, SSPC-PA 1, SSPC-PA 2, SSPC-PA 9, and other pertinent standards and recommended practices.

H. Inspection at Hold Points:
1. Conduct inspections at Hold Points during the coating system application and record the results.
2. Coordinate Hold Points with the Engineer so the Engineer can observe the Contractor's inspections on a scheduled basis.
3. Provide the Engineer with a minimum of 24 hours of notice before conducting Hold Point inspections.
4. Hold Points shall be as follows:
    a. Conditions before surface preparation: Before starting surface preparation, observe, record, and confirm that oil, grease, and/or soluble salts are gone from the surface.
    b. Post surface preparation: After completing surface preparation, measure and inspect for cleanliness and proper surface profile as specified in this Section and in the CSM's written instructions.
    c. Coatings application: At the beginning of any coating system application, measure, record, and confirm acceptability of surface and ambient air temperature and humidity. Inspect applicator's equipment for serviceability and suitability for coatings application.

    d. Coatings application: At the beginning of coating system application, measure, record, and confirm acceptability of surface and ambient air temperature and humidity. Inspect applicator's equipment for serviceability and suitability for coatings application.
        1) Observe conditions during the pre-application meeting.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Immediately remove unspecified and unapproved coatings from the Project Site.

B. Deliver new, labeled, unopened containers:
1. Do not deliver materials after the manufacturer's expiration date or over 12 months from manufacturing date, whichever is more stringent. Store materials in well-ventilated enclosed structures and protect from weather and excessive heat or cold in accordance with the CSM's recommendations.
    a. Store flammable materials in accordance with federal, state, and local requirements.
    b. Store rags and cleanup materials appropriately to prevent fire and spontaneous combustion.
2. Store and dispose of hazardous waste in accordance with federal, state, and local requirements. This requirement specifically applies to waste solvents and coatings.

3. Container labels shall show the following:
    a. Brand name or product title.
    b. CSM's batch number.
    c. CSM's manufacture date.
    d. CSM's name.
    e. Generic material type.
    f. Application and mixing instructions.
    g. Hazardous material identification label.
    h. Shelf-life expiration date.
    i. Color.
    j. Mixing and reducing instructions.
4. Clearly mark containers to indicate safety hazards associated with the use of or exposure to materials.

1.07 PROJECT CONDITIONS

A. Apply coatings to dry surfaces.
    1. Surface moisture: In accordance with the manufacturer's requirements or as specified in this Section.

B. Do not apply coatings when the following conditions exist. If such conditions exist, provide containment, covers, environmental controls, and other necessary measures.
    1. During rainy, misty, or damp weather, or to surfaces with frost or condensation.
    2. When the surface temperature is below 10 degrees Fahrenheit above the dew point.
    3. When ambient or surface temperature:
        a. Is less than 55 degrees Fahrenheit unless the manufacturer allows a lower temperature.
        b. Is less than 65 degrees Fahrenheit for clear finishes unless the manufacturer allows a lower temperature.
        c. Exceeds 90 degrees Fahrenheit unless the manufacturer allows a higher temperature.
        d. Exceeds the manufacturer's recommendation.
    4. When relative humidity is higher than 85 percent.
    5. Under dusty or adverse environmental conditions.
    6. When light on surfaces measures less than 15-foot candles.
    7. When wind speed exceeds 15 miles per hour.

C. Apply coating only under evaporation conditions rather than condensation.
    1. Use dehumidification equipment, fans, and/or heaters inside enclosed areas to maintain required atmospheric and surface temperature requirements for proper coating application and cure.
    2. Measure and record relative humidity and air and surface temperatures at the start and end of each shift to confirm proper humidity and temperature levels inside the work area.
        a. Submit test results.

D. Continuously ventilate, dehumidify, and heat enclosed spaces with high humidity during surface preparation, coating application, and curing.
    1. Maintain minimum air temperature of 55 degrees Fahrenheit and 10 degrees Fahrenheit above the dew point.

2. Maintain dew point of at least 10 degrees Fahrenheit less than the temperature of the coldest part of the structure where work is performed.
3. Reduce dew point temperature in conditioned space by at least 10 degrees Fahrenheit within 20 minutes.
4. Seal work areas and maintain positive pressure in accordance with the dehumidification equipment supplier's recommendations.
5. Maintain these conditions before, during, and after application to ensure proper adhesion and cure of coatings for no less than:
    a. Entire curing period.
    b. 8 hours after coating.

E. Systems:
1. Internal combustion engine generators may be used.
    a. Obtain required permits and provide air pollution and noise control devices on equipment as required by permitting agencies require.
    b. Comply with state, federal, and local fire and explosion protection measures when locating and operating generators.
    c. Locate engine generator outside hazardous classified areas in accordance with NFPA 820.
    d. Provide daily fuel service for generators for duration of use.
2. Dehumidification:
    a. Provide desiccant or refrigeration drying.
    b. Use only desiccant types with a rotary desiccant wheel capable of continuous operation.
    c. Liquid, granular, or loose lithium chloride drying systems are not acceptable.
3. Heating:
    a. Use electric, indirect combustion, or steam coil.
    b. Direct-fired combustion heaters are not acceptable heat sources during abrasive blasting, coating application, or coating cure.
4. Filters:
    a. Use a filtration system for dust removal designed to not interfere with the dehumidification equipment's ability to control dew point and relative humidity inside the reservoir.
    b. Do not allow air from the working area or dust filtration equipment to recirculate through thein dehumidifier during coating application or when solvent vapors are present.
5. Design and Submittals:
    a. Prepare and submit dehumidification and heating plan, including all equipment, and operating procedures.
    b. Suppliers of services and equipment shall have at least 3 years of experience in similar applications.

F. Provide containment and ventilation system components in accordance with SSPC-Guide 6, Level 3, and as required for hazardous materials.

1.08 MAINTENANCE

A. Provide extra materials:
   1. Minimum 1 gallon of each type and color of coating applied or provide additional quantities if specified in the Contract Documents:
      a. Deliver unopened factory-labeled cans when the manufacturer packages material in gallon cans.
      b. Deliver material in new gallon containers, properly sealed and identified with permanently affixed, durable, printed labels indicating brand, type, and color, when the manufacturer does not package material in gallon cans.

1.09 TECHNICAL REPRESENTATIVES' RESPONSIBILITIES

A. General:
   1. Attend pre-installation conference.
   2. Perform on-site application training.

B. Coating system installation training:
   1. Provide a minimum of 8 hours of classroom and off-site training for application personnel and supervisory personnel in one of the following ways:
      a. Train a minimum of 2 supervisory personnel and 2 application personnel.
      b. Submit a letter from the CSM stating that CSM approves the supervisory and application personnel, listed by name and responsibility, and no additional training is required.
   2. CTR can train up to 14 application personnel and 3 supervisory personnel at a time.
   3. Minimum training requirements:
      a. Explain in detail the mixing, application, curing, and termination requirements.
      b. Provide hands-on demonstration of coating system mixing.
      c. Explain in detail the ambient condition requirements for temperature and humidity.
      d. Explain in detail the surface preparation requirements.
      e. Explain in detail the re-coat times, cure times, and related ambient condition requirements.
      f. Write a letter stating that training was satisfactorily completed by the personnel, listed by name and responsibility.
   4. Provide special training as specified in the coating detail sheets.
   5. Visit the Site at the following intervals:
      a. On the first day of application of any coating system.
      b. As necessary during surface preparation and application to ensure installations are made in accordance with the manufacturer's recommendations.
      c. As required to resolve field problems attributed to or associated with the manufacturer's products.
   6. Routinely inspect and verify in writing that application personnel have successfully performed surface preparation, filler/surfacer application, coating

system application, and quality control inspection in accordance with this Section and to warrantable quality.
   a. Be on site to periodically observe and oversee:
      1) Coating application.
      2) End of surface preparation.
      3) During coating application.
      4) Post-cure inspection.
7. Conduct final review of completed coating system installation and submit detailed report to the Owner.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Coating materials shall be formulated for environments encountered in water and wastewater treatment processes.

B. Coating materials that encounter water distributed as potable water shall be certified in accordance with NSF 61.

2.02 COATING SYSTEMS IDENTIFICATION

A. Naming conventions: Coating systems identifications contain the elements defined in Table 1.

Table 1. Coating System Identification Elements

First Element	**-**	**Second Element**	**-**	**Third Element**	**-**	**Fourth Element (optional)**
3 or 4 alpha characters		1-3 alpha characters		1 number		3 or 4 alpha characters
Coating Type		Substrate		System Number		Additional Substrate or Special Condition
Example: EPX	-	C	-	6	-	BSC

1. First element identifies the coating type using the following abbreviations:
   a. ACR: Acrylic.
   b. CTE: Coal tar epoxy.
   c. ELA: Elastomeric acrylic.
   d. EPU: Epoxy-polyurethane.
   e. EPX: Epoxy.
   f. POL: Polyurethane.
   g. SIL: Silicone.
   h. SILX: Siloxane or silane.
   i. VE: Vinyl ester.
2. Second element identifies the substrate using the following abbreviations:
   a. C: Concrete or masonry.
   b. F: Concrete flooring.
   c. FRP: Fiber-reinforced plastic.
   d. GM: Galvanized metal.
   e. M: Metal.

f. PVC: Polyvinyl chloride, chlorinated polyvinyl chloride.

3. Third element identifies the sequential system number.
   a. For example, EPX-C-2 is the second standard epoxy coating system for concrete substrates.
4. Fourth element is optional and identifies the additional substrate or special condition with the following abbreviations:
   a. BG: Below grade or buried.
   b. BSC: Biogenic sulfide corrosion-resistant applications in wastewater.
   c. OZ: Organic zinc primer, epoxy polyurethane system.
   d. PWS: Potable water service applications (NSF-61 approved).
   e. SC: Secondary containment.

2.03 PRODUCTS FOR COATING SYSTEMS

A. Products: As specified in Attachment B – Coating Detail Sheets.

B. Cleaning solvents:
   1. Requirements for solvent wash, solvent wipe, or cleaner used, including, but not limited to, those used for surface preparation in accordance with SSPC-SP 1.
   2. Use clean white cloths and clean fluids in solvent cleaning.

PART 3 EXECUTION

3.01 GENERAL PROTECTION REQUIREMENTS

A. Protect adjacent surfaces from coatings and damage associated with coating work and repair any damage that occurs.

B. Place coating waste, cloths, and material that may pose a fire hazard in closed metal containers and remove daily from the Site.

C. Remove electrical plates, surface hardware, fittings, and fasteners before coating application.
   1. Carefully store, clean, and replace items after completing coating in each area.
   2. Do not use solvent or degreasers to clean hardware that may remove permanent lacquer finishes.

D. Erect and maintain protective enclosures in accordance with SSPC-Guide 6.

E. Protect the following surfaces from abrasive blasting by masking or by other means:
   1. Threaded portions of valve and gate stems, grease fittings, and identification plates.
   2. Machined surfaces for sliding contact.
   3. Surfaces to be assembled against gaskets.
   4. Surfaces of shafting where sprockets will be fit.
   5. Surfaces of shafting where bearings will be fit.
   6. Machined bronze surfaces, including slide gates.
   7. Cadmium-plated items, except cadmium-plated, zinc-plated, or sherardized fasteners used to assemble equipment requiring abrasive blasting.

8. Galvanized items, unless scheduled to be coated.

3.02 GENERAL SURFACE PREPARATION REQUIREMENTS

A. Prepare surfaces in accordance with coating detail sheets in Attachment B – Coating Detail Sheets.
   1. Include coating and surface preparation requirements.
   2. CSM's instructions will also have surface preparation requirements but follow the more stringent if information conflicts.

B. Where required by the Owner's representative, a NACE International certified coatings inspector, provided by the Owner, will inspect and approve surfaces to be coated before applying a coating.
   1. Applicator shall coordinate coating inspections.
      a. Identify coating inspection Hold Points during the pre-installation conference.
      b. Provide at least 2 days' notice before inspection.
   2. Correct surface defects identified by the inspector at no additional cost to the Owner.

3.03 MECHANICAL AND ELECTRICAL EQUIPMENT PREPARATION

A. Remove grilles, covers, and access panels for mechanical and electrical system and coat separately.

B. Prepare and finish coat equipment primed by the manufacturer using specified intermediate and topcoats, as applicable, and color selected by the Owner.

C. Prepare, prime, and coat both insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars, and supports, except where items are covered with material not requiring coating, or with a prefinished coating.

D. Replace identification markings on mechanical or electrical equipment when coated over or spattered.

E. Prepare and coat dampers exposed immediately behind louvers, grilles, and convector and baseboard heating cabinets to match face panels.

F. Prepare and coat exposed conduit and appurtenances occurring in finished areas with color and texture to match adjacent surfaces.

G. Prepare and coat sides, front, back, and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

H. Color code equipment, piping, conduit, and exposed ductwork and apply color banding and identification, such as flow arrows, naming, and numbering, in accordance with the Contract Documents.

3.04 CLEANING OF NEW AND PREVIOUSLY COATED OR NEW SURFACES

A. Utilize cleaning agent to remove soluble salts, such as chlorides, from concrete and metal surfaces:
   1. Cleaning agent: Biodegradable non-flammable and containing no VOC.
   2. Manufacturers: The following or equal:
      a. CHLOR*RID International, Inc.
         1) Complete soluble salt removal with steam or warm water cleaning.
   3. Steam clean and degrease surfaces to be coated to remove oils and grease.
   4. Test cleaned surfaces to ensure removal of soluble salts. Carry out additional cleaning as needed.
   5. Complete final surface preparation before applying the new coating system in accordance with the manufacturers printed instructions.

3.05 BLAST CLEANING

A. Surface preparation requirements:
   1. Do not reuse spent blast abrasive.
   2. Ensure that filter compressed air used for blast cleaning is free of condensed water and oil.
      a. Clean moisture traps at least once every 4 hours or more frequently, as required, to prevent moisture from entering the abrasive blasting equipment air supply.
      b. Check blast air for moisture and oil after each cleaning in accordance with ASTM D4285.
   3. Install oil separators just downstream of compressor discharge valves and at the discharge point of blast pot discharges. Check separators on the same frequency as the moisture traps.
   4. Keep regulators, gauges, filters, and separators on compressor air lines connected always when blasting nozzles operational.
   5. Install an air dryer or desiccant filter drying unit to dry the compressed air before blast pot connections. Use and maintain the dryer throughout surface preparation work.
   6. Use a venturi-type, or other high velocity-type, abrasive blast nozzles supplied with at least 100 pounds per square inch gauge air pressure at the nozzle and enough volume to obtain appropriate blast cleaning production rates and surface cleanliness.
   7. Provide airborne particulate evacuation and filtering that meets OSHA safety standards. Maintain optimal visibility both to clean and provide the specified surface profile and to allow inspection of the substrate during surface preparation work.
   8. Surfaces blasted and prepared and not coated/painted the same day shall be re-prepared prior to coating/painting. Any rust-back occurring before coating shall be removed.
   9. Prepared blasted surfaces may be open longer if dehumidification (DH) is used to reduce moisture vapor and eliminate the potential for rust-back.

3.06 GENERAL PREPARATION REQUIREMENTS FOR METALLIC SURFACES

A. Remove rust, scale, and welding slag and spatter.
   1. Remove and grind smooth excessive weld material and weld spatter on metal surfaces before blast cleaning in accordance with NACE SP0178.
   2. Grind sharp edges on metal substrate to approximately 1/16-inch radius before abrasive blast cleaning.

B. Prepare metallic surfaces in accordance with applicable portions of surface preparation specifications of the SSPC specified for each coating system.
   1. Remove grease and oil in accordance with SSPC-SP 1.
   2. Measure profile depth of the surface to be coated in accordance with Method C of ASTM D4417. Select blast particle size and gradation to produce the specified surface profile.
   3. Constantly monitor and maintain ambient environmental conditions to ensure cleanliness and that no “rust back” occurs before coating material application.
   4. Surfaces not coated the same day they are prepared shall be re-prepared prior to coating unless approved moisture control equipment is used and approved by the Owners representative.

C. Prepare metallic surfaces by blast cleaning in accordance with SSPC-VIS 1 (ASTM D2200). Prepare abrasive blast representative areas for the Owner’s representative to inspect on the first day of cleaning.

D. Unless otherwise specified, the requirements for blast cleaning steel, ductile iron, and stainless-steel substrates are as follows:
   1. Ferrous metal surfaces not to be submerged: Abrasive blast in accordance with SSPC-SP 10 unless blasting may damage adjacent surfaces, is prohibited, or is specified otherwise. Where abrasive blasting is not possible, clean surfaces to bare metal with power tools in accordance with SSPC-SP 11.
   2. Ferrous metal surfaces to be submerged: Abrasive blast in accordance with SSPC-SP 5, unless specified otherwise, to clean and provide roughened surface profile with a depth between 2 and 4 mils.
   3. Remove traces of grit, dust, dirt, rust scale, friable material, loose corrosion products, or embedded abrasive from substrate before coating application.
   4. When abrasive blasted surfaces rust or discolor before coating, abrasive blast clean surfaces again.

E. Field preparation of shop-primed surfaces:
   1. Smooth welds and prominences with power tools before applying field-applied coatings.
   2. Clean and dry shop-primed ferrous metal surfaces and fabricated assemblies before applying field coats.
   3. Prepare shop epoxy primed surfaces with light abrasive blasting or abrading and then vacuum before applying finish coats.
      a. Follow CSM instructions for surface preparation when the primer recoat limit has been exceeded.
   4. Non-immersion service: Clean in accordance with SSPC-SP 2 or SSPC-SP 3 and uniformly roughen.
   5. Immersion, BSC, and SC service: Remove shop primer in accordance with SSPC-SP 5.

F. Damaged shop primer or rust bleeding:
   1. Ferrous metals: Clean in accordance with SSPC-SP 1 and spot blast in accordance with SSPC-SP 10 to achieve a uniform surface profile between 2.0 and 2.5 mils before recoating.
   2. Reject galvanized steel with rust bleeding.

G. Damaged coating: Repair by abrasive blast cleaning surfaces as specified for the coating system; feather to a smooth transition before touching up.

3.07 PREPARATION REQUIREMENTS BY SURFACE TYPE

A. Steel and ferrous metal surfaces that require coating:
   1. Degrease or solvent clean (SSPC-SP 1).
   2. Abrasive blast surfaces to a SSPC-SP 10 for non-immersion and a SSPC-SP 5 for immersion.
      a. If abrasive blast cannot be performed, abrade in accordance with SSPC-SP 7.

B. Galvanized steel and non-ferrous metal surfaces:
   1. Degrease or solvent clean (SSPC-SP 1) to remove oily residue.
   2. Abrasive blast clean in accordance with SSPC-SP 16.
      a. If abrasive blast cannot be performed, abrade in accordance with SSPC-SP 3.
   3. Apply metal pretreatment within 24 hours before coating galvanized surfaces that cannot be thoroughly abraded, such as bolts, nuts, or preformed channels.
   4. Test surface for contaminants using copper sulfate solution.

C. Stainless-steel surfaces:
   1. Abrasive blast clean in accordance with SSPC-SP 16 to leave a clean, uniform appearance with surface profile between 1.5 and 2.5 mils.

D. Ductile iron pipe and fittings to be lined or coated: Abrasive blast clean in accordance with NAPF 500-03.

E. Sherardized, aluminum, copper, and bronze surfaces:
   1. Abrasive blast clean in accordance with SSPC-SP 16.
   2. Prepare in accordance with the CSM's instructions.

F. Cadmium-plated, zinc-plated, or sherardized fasteners:
   1. Abrasive blast in the same manner as uncoated metal when assembling equipment designated for abrasive blasting.

G. PVC and FRP surfaces:
   1. Lightly sand surfaces to be coated.
      a. Sand to remove gloss and establish uniform surface profile.
   2. Vacuum to remove loose dust, dirt, and other materials.
   3. Solvent clean with clean white rags and allow solvent to evaporate completely before applying coating materials.

3.08 APPLICATION REQUIREMENTS

A. Apply coatings in accordance with the manufacturer's instructions.

B. Empty aboveground piping to be coated of contents when applying coatings.

C. Items to be coated: Commercial or manufactured items with a factory or shop-applied coating system.
   1. Factory or shop-applied permanent coating system:
      a. Commercial components shall be coated with the manufacturer's standard surface preparation and applied permanent coating system:
         1) Pumps and valves: Shop coat with the manufacturer's highest quality coating system in accordance with the Project Specifications.
         2) Non-immersed equipment: Touch up shop primer, and coat in the field with specified coating system after installation.
         3) Immersed equipment with shop primer: Touch up shop primer and coat in the field with specified coating system after installation.
   2. Items subject to sunlight shall be topcoated with ultraviolet (UV) stable materials.
   3. Permanent coating system shall have a 10-year corrosion-free protection without significant defects stored in atmospheric exposure.
   4. Color and gloss: Manufacturer's standard color unless a specific color is otherwise specified in the color schedule or indicated on the Drawings.
   5. Field repair: Repair damaged areas of coated surfaces with compatible materials to equal thickness and color match of undamaged areas.

D. Repair damaged galvanized surfaces in accordance with ASTM A780. Repair materials containing cadmium and lead are not permitted.

E. Stainless steel surfaces to receive uniform passivation. Clean and restore uniform passivation layer on damaged, contaminated, or depassivated stainless steel surfaces in accordance with ASTM A380.

F. Wash coat and prime sherardized, aluminum, copper, and bronze surfaces, or prime with the manufacturer's recommended special primer.

G. Use equipment designed to apply materials specified.
   1. Use compressors with moisture traps and filters that remove water and oils from the air.
      a. Perform a paper blotter test at the Engineer's request to verify air is sufficiently free of oil and moisture. Do not allow the amount of oil and moisture to exceed the CSM-recommended amount.
   2. Equip spray equipment with properly sized mechanical agitators, pressure gauges, pressure regulators, and spray nozzles.

H. Where 2 or more coats are required, tint prime coat intermediate coats as necessary to distinguish each coating and to help indicate coverage.

I. Apply coating by brush, roller, trowel, or spray, unless a specific application method is required by the coating manufacturer's instructions or these Specifications.
   1. With a brush, stripe coat edges, welds, corners, nuts, bolts, and difficult-to-reach areas, as necessary, before spray application to ensure specified coating thickness along edges.
   2. After the prime coat dries, mark, repair, and retest pinholes and holidays before intermediate or topcoats are applied.

J. Spray application:
   1. With a brush, stripe coat edges, welds, corners, nuts, bolts, and difficult-to-reach areas, as necessary, before spray application to ensure specified coating thickness along edges.
   2. When using spray application, apply each coat to a thickness no greater than recommended in the coating manufacturer's instructions.
   3. Use airless spray method unless air spray method is required by the CSM's instruction or these Specifications.
   4. Conduct spray coating under controlled conditions. Protect adjacent construction and property from coating mist, fumes, or overspray.

K. Shop and field coats:
   1. Prime coat: Shop-apply or field-apply prime coats as specified. Use shop-applied primer compatible with the specified field coating system and apply at the minimum dry film thickness recommended by the finish coat CSM.
      a. Provide datasheets identifying the shop primer to on-site coating application personnel.
      b. Perform adhesion tests on the shop primer.
      c. Remove and recoat damaged, deteriorated, and poorly applied shop coatings.
      d. If the shop primer coat meets this Section's requirements, spot prime exposed metal of shop-primed surfaces before spray applying primer over the entire surface.
   2. Field coats: Apply field coats with one or more prime coats and finish coats to build up coating to dry film thickness specified for the coating system.
      a. Do not apply finish coats until other work in the area is complete and previous coats are inspected.
   3. Adhesion confirmation: Perform adhesion tests after proper coating cure in accordance with ASTM D3359. Demonstrate that:
      a. Primer coat adheres to the substrate.
      b. Coatings adhere to the primer and intermediate coats.
         1) Coating 5 mils or more DFT: Achieve adhesion test result of 5A on immersed surfaces and 4A or better on other surfaces.
         2) Coating less than 5 mils DFT: Achieve adhesion test results of 5B on immersed surfaces and 4B or better on other surfaces.

L. Plural component coating application:
   1. Premix contents of component drums if required by the CSM each day.
   2. Before starting application:
      a. Verify gauges are working properly.
      b. Complete ratio checks.
      c. Sample the mix on plastic sheeting to ensure set time is appropriate and complete.

d. Label and retain spray samples. Submit to the Engineer when requested.

M. Drying and recoating:
1. Provide means to prevent condensate or dew on substrate surface or between coats and during curing after applying the last coat.
2. Allow each coat to cure or dry thoroughly, in accordance with, if required, the CSM's printed instructions before recoating.
3. Use the CSM's printed instructions and the requirements specified in this Section to determine the minimum required drying time.
   a. Recoat coatings within time limits recommended by CSM.
   b. If time limits are exceeded, abrasive blast clean and de-gloss clean before applying another coat.
4. Ensure primer and intermediate coats of coating are unscarred and completely integral when applying each succeeding coat.
5. Touch up suction spots between coats and apply additional coats where required to produce finished surface of solid, even color, free of defects.
6. Repair holidays in accordance with the requirements on pertinent Coating Detail Sheets or as recommended by the CSM.
7. Sand and feather to a smooth transition and recoat scratched, contaminated, or otherwise damaged coating surfaces so repairs are invisible to the naked eye.

N. Workmanship:
1. Ensure that coated surfaces are free from runs, drips, ridges, waves, laps, dry spray, and brush marks. Coats shall be applied to produce a smooth, even film of uniform thickness completely coating corners and crevices.
2. Evenly apply each coat of material and sharply cut to a line created with masking tape or other suitable materials.
3. When coating complex steel shapes, stripe coat welds, edges of structural steel shapes, metal cut-outs, pits in steel surfaces, or rough surfaces with the primer before overall coating system application.
   a. Brush apply stripe coat to ensure proper coverage.
   b. Do not stripe coat with spray or roller.
4. Ensure that the finish coat, including repairs, has a uniform color and gloss.

O. Coating properties, mixing, and thinning:
1. If maximum recoat time is exceeded, prepare surface with solvent washing, light abrasive blasting, sanding, or other procedures in accordance with the CSM's instructions.
2. Allow adequate drying time between coats as instructed by the CSM, adjusted as necessary for the Site conditions.
3. Ensure that coatings, when applied, provide a satisfactory film and a smooth even surface. Lightly sand glossy undercoats to provide a surface suitable for proper application and adhesion of subsequent coats. Thoroughly stir and strain coating materials during application and maintain uniform consistency.
4. Mix coatings with 2 or more components in accordance with the CSM's instructions.
5. Where necessary to suit conditions of the surface, temperature, weather, and method of application, thin the coating in accordance with the CSM's recommendations.
   a. Ensure that volatile organic content (VOC) of the thinned coating complies with prevailing air pollution control regulations.

b. Thin coatings to only what is necessary to obtain proper application characteristics.
c. Use a thinner recommended by the CSM.

P. Film thickness and continuity:
1. Apply coating to the specified thicknesses.
a. Apply additional coats when necessary to achieve specified thicknesses, especially at edges and corners.
2. Verify WFT of the coating system first coat and after applying each subsequent coat.
3. Do not allow the minimum thickness at any point to deviate more than 20 percent on the low end and 120 percent on the high end from the required average.
4. Do not allow the surface area covered per gallon of coating for various types of surfaces to exceed those recommended by the CSM.
5. Apply additional coats to achieve the specified dry film thickness if brush or roller application methods cannot achieve the specified film thickness per coat.

Q. Protecting coated surfaces:
1. Do not handle, work on, or otherwise disturb coated items until the coating is completely dry and hard.
2. After installation, recoat shop-coated surfaces with specified coating system as necessary to match surrounding surfaces, and to coordinate with the specified color identification requirements.

R. Special requirements:
1. Before erection, apply all but the final finish coat to interior surfaces of roof plates, roof rafters and supports, pipe hangers, piping in contact with hangers, and contact surfaces inaccessible after assembly. Apply final coat after erection.
2. Coat structural slip-critical connections and high strength bolts and nuts after erection.
3. Areas damaged during erection:
a. Prepare surface for spot repairs as specified for the coating system.
b. Recoat with prime coat before applying subsequent coats.
c. Touch up surfaces after installation.
d. Clean and dry surfaces to be coated at time of application.
4. Coat underside of equipment bases and supports not galvanized with at least 2 coats of primer specified before setting the equipment in place.
5. Coat aluminum surfaces in contact with concrete.

3.09 COATING SYSTEMS

A. Attachment A – Schedule of Surfaces to be Coated specifies surfaces to be coated in the field with the coating systems required.

3.10 SURFACES NOT REQUIRING COATING

A. Stainless steel piping, valves, pipe supports, instrument sunshades.
   1. Clean and restore uniform passivation layer on damaged, contaminated, or de-passivated stainless-steel surfaces in accordance with ASTM A380.

B. Sliding surfaces on expansion joints, motor and pump shafts, machined surfaces at bearings and seals, grease fittings, etc.

C. Galvanized structural steel framing, galvanized roof decking, galvanized pipe supports.

D. Copper and brass pipe, fittings, valves, etc.

E. Bronze valves, bearings, bushings, and fasteners.

F. Corrosion resistant special alloys: Inconel, Alloy 20, Hastelloy, etc.

G. Plastic surfaces, except coat PVC, CPVC, and other plastic piping system exposed to sunlight.

H. Exception – Piping that is encased in concrete or cement mortar:
   1. Coat the first 6 inches of pipe to be encased.
   2. Caulk gaps and seams after encasement.

3.11 QUALITY CONTROL

A. CSA to perform, or contract with an inspection agency to perform, quality control inspection and testing of the coating work covered by this Section. These inspections shall include the following:
   1. Prepare reports, after daily coating work ends, summarizing each day's test data, observations, drawings, and photographs.
   2. Perform the following activities to confirm conformance with the specifications:
      a. Inspect ambient conditions during coating system installation at Hold Points for conformance with the specified requirements.
      b. Inspect each coated surface type and coating system applied to verify the following:
         1) Inspect materials upon receipt to ensure that the CSM supplied them.
         2) Verify that specified storage conditions for the coating system materials, solvents, and abrasives are provided.
         3) Inspect and record findings for substrate cleanliness.
         4) Inspect and record pH of concrete and metal substrates.
         5) Inspect and record substrate profile (anchor pattern).
         6) Measure and record ambient air and substrate temperature.
         7) Measure and record relative humidity.
         8) Verify that mixing of coating system materials is in accordance with the CSM's instructions.
         9) Inspect, confirm, and record that the coating system materials' "pot life" is not exceeded during installation. Inspect to verify that recoat limitations for coating materials are not exceeded.
         10) Perform adhesion testing.

11) Measure and record the coating system's thickness.
12) Verify proper curing of the coating system in accordance with the CSM's instructions.
13) Holiday or continuity testing in accordance with NACE SP0188 for coatings that will be immersed or exposed to aggressively corrosive conditions.
14) Prepare and submit written reports directly to the Owner's representative at the shift's end:
    a) Reports shall identify observations and testing relative to the quality of the surface preparation and painting/coatings work.
    b) Reports shall address any conditions observed which have the potential to adversely impact the finished painting/coating system integrity and performance.
    c) Any such findings shall be immediately repaired.

c. Verify surface profile of substrates by completing the following:
    1) Inspect preparation and application of coating detail treatment at terminations, transitions, metal embedment's in concrete, and joints and cracks in substrates.

B. Damaged factory finishes shall be repaired and, if directed by the Owner's representative, refinished the entire surfaces of the factory-finish equipment at the applicators' expense.

C. Owner-provided inspection or inspection by others does not limit the required Contractor's or CSA's responsibilities for quality workmanship or quality control. Owners' inspection is in addition to any inspection performed by the applicator.

3.12 CORRECTIVE MEASURES

A. Repair pinholes or holidays identified by holiday testing as follows:
1. Remove coating system at pinholes and holidays at least 2-inches diameter around the defect back to expose substrate.
2. Aggressively abrade or sand the intact coating system surfaces at least 3 inches beyond the removal area in all directions to produce a uniform 6- to 8-mil profile in the intact coating system.
3. Remove dust, dirt, etc., leaving clean, sound surfaces.
4. Tape to mask the periphery of the prepared intact coating area to prevent coating repair application onto the prepared area.
5. Apply the coating system with enough coats to achieve the specified finish coat thickness over the defect and coating removal area. Feather the coating onto the abraded coated surfaces around the removal area to avoid a lip and to achieve a neat repair outline.
6. Follow curing time between coats as specified by the CSM for the Site conditions. Solvent wash and abrasive blast in accordance with the CSM's instructions if the maximum recoat time is exceeded.
7. Apply coating at specified dry film thickness.

3.13 CLEANUP

A. Remove surplus materials, protective coverings, and accumulated rubbish after completing coating. Thoroughly clean surfaces and repair overspray or other coating-related damage.

3.14 FINAL INSPECTION

A. Conduct final inspection of coating system work to determine whether it meets specifications requirements.

B. Conduct subsequent final inspection with the Engineer to ensure Work is in accordance with Contract Documents requirements.

C. Mark any rework required.
   1. Re-clean and repair, as specified, at no additional cost to the Owner.

END OF SECTION

ATTACHMENT A – SCHEDULE OF SURFACES TO BE COATED

ATTACHMENT A
Schedule of Surfaces to be Coated

A. The following schedule is incomplete. Coat unlisted surfaces with same coating system as similar listed surfaces. Contact Engineer for clarification.

EPX-M-2-PWS	Metals: immersed and in contact with water being treated for domestic use (potable water).

Notes:

1: Non-immersed ferrous metal surfaces include:
- a. Doors, doorframes, ventilators, louvers, grilles, exposed sheet metal, and flashing.
- b. Pipe, valves, pipe hangers, supports and saddles, conduit, cable tray hangers, and supports.
- c. Motors and motor accessory equipment.
- d. Drive gear, drive housing, coupling housings, and miscellaneous gear drive equipment.
- e. Valve and gate operators and stands.
- f. Structural steel.
- g. Crane and hoist rails.
- h. Exterior of tanks and other containment vessels.
- i. Mechanical equipment supports, drive units, and accessories.
- j. Bare electrical equipment: boxes, exposed conduit, and accessories.
- k. Pumps not submerged.
- l. Other miscellaneous metals.

2: Immersed ferrous metal surfaces include:
- a. Interior surfaces of ferrous metal tanks.
- b. Field priming of ferrous metal surfaces with defective shop-prime coat; including non-submerged service.
- c. Bell rings, underside of manhole covers and frames.
- d. Sump pumps, including underside of base plates and submerged suction and discharge piping.
- e. Exterior of submerged piping and valves other than stainless steel or PVC piping.
- f. Submerged pipe supports and hangers.
- g. Stem guides.
- h. Other submerged iron and steel metal unless specified otherwise.

ATTACHMENT B – COATING DETAIL SHEET

Attachment B			
Coating Detail Sheet			
Coating System	EPX-M-2-PWS		
Coating Material	Ultra-high Solids Epoxy		
Substrate	Metal		
Products: One of the following or equal:	Primer	Intermediate Coat	Finish Coat
Carboline	Plasite 4500	None Applied	Plasite 4500
International Paint	No product specified	No product specified	No product specified
PPG	No product specified	No product specified	No product specified
Sherwin Williams	Sher-Plate	None Applied	Sher-Plate
Tnemec	Series 22	None Applied	Series 22
Service Condition	Immersed, moderately corrosive environment in contact with Potable Water.		
Surface Preparation			
General	Prepare surfaces as specified in this Section and as follows.		
Ferrous Metal	Bare surfaces: SSPC-SP5, White Metal Blast Cleaning. Shop primed surfaces: SSPC-SP7, Brush-Off Blast Cleaning. Damaged primer or rust: SSPC-SP5, White Metal Blast Cleaning and spot prime.		
Surface Profile			
Ferrous Metal	2.0 to 2.5 mils		
Primed surfaces	1.0 to 1.5 mils on the intact primer.		
System Thickness (Dry Film)			
Total	16 to 25 mils		
Application			
Special CTR Training	Required.		

SECTION 46_05_10

COMMON WORK RESULTS FOR MECHANICAL EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Mechanical equipment requirements for:
      a. Basic design and performance criteria.
      b. Prescriptive requirements for common components.
      c. Installation requirements.

1.02 REFERENCES

A. American Bearing Manufacturers Association (ABMA):
   1. 9 - Load Ratings and Fatigue Life for Ball Bearings.
   2. 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. American Gear Manufacturers Association (AGMA) Standards.

C. American Petroleum Institute (API):
   1. 682 - Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps.

D. ASTM International (ASTM):
   1. A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
   2. A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
   3. A320 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service.
   4. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
   5. F594 - Standard Specification for Stainless Steel Nuts.

E. Hydraulic Institute (HI):
   1. 9.6.8 - Guideline for Dynamics of Pumping Machinery.

F. International Concrete Repair Institute (ICRI):
   1. Guideline No. 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

G. International Organization for Standardization (ISO):
   1. 21940 - Mechanical Vibration - Rotor Balancing - Part 1: Introduction.

H. National Electrical Manufacturers Association (NEMA):
   1. MG-1 - Motors and Generators.

I. Society for Protective Coatings (SSPC):
   1. SP 1 - Solvent Cleaning.

1.03 TERMINOLOGY

A. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section, have the indicated meaning.
   1. Definitions used in this specification and equipment Submittals for terms related to rotor-dynamic pumps shall be in accordance with HI 9.6.8, Appendix A, as clarified below.
   2. These definitions shall be applied to equipment other than pumps, unless otherwise specified in Technical Sections.
   3. Resonant frequency:
      a. Frequency of a periodic excitation force that is close to the natural frequencies of an object. Also known as critical frequency, critical speed, or resonant speed.
      b. An undamped resonant frequency within the separation margin is always considered harmful under Level 1 analysis.
      c. A resonant frequency that occurs within a separation margin of 15 percent above or below the operating speed range and has a log decrement greater than +0.3 is considered harmful under Level 2 and Level 3 analysis.
   4. Rotordynamic analysis level:
      a. Level of detail required for rotordynamic analysis is indicated in the Technical Sections schedules as None (no analysis required), Analysis Level 1, Analysis Level 2, or Analysis Level 3, which correlate to increasing levels of required detailed equipment design analysis. Analysis Levels 1, 2, and 3 are based on HI 9.6.8.
      b. Where these specifications differ from HI the more stringent shall apply.
   5. Separation margin:
      a. Span of operating speeds within which interference between excitation orders and resonant frequencies indicate the possibility of harmful vibrations.
      b. Separation margin for a specific application extends 15 percent above and 15 percent below the span of operating speed required for the specified performance conditions.

1.04 SUBMITTALS

A. Items in this Section are components of equipment or systems specified in other Sections.
   1. Include data for this Section’s components with the equipment or system Submittal.

PART 2 PRODUCTS

2.01 BEARINGS

A. Oil or grease lubricated, ball or roller antifriction type, of standard manufacture.
   1. Design lubrication system based on the equipment location to operate in the temperatures as specified in Section 01_81_50 - Design Criteria.
      a. To safely start after being shut off for 24 hours and operate safely:
         1) Suitable for the outdoor winter temperature as specified in Section 01_81_50 - Design Criteria.

B. Oil-lubricated:
   1. Provide either pressure lubricating system or separate oil reservoir splash-type system as specified in the Technical Section.
   2. Design system to safely absorb heat energy generated in bearings when equipment is operating in the following conditions:
      a. With the highest load and the temperature 15 degrees Fahrenheit above the outdoor summer temperature as specified in Section 01_81_50 - Design Criteria.

C. Grease lubricated, except those specified to be factory sealed:
   1. Fit with easily accessible grease supply, flush, drain, and relief fittings.
   2. Lubrication lines and fittings:
      a. Lines: Minimum 1/4-inch diameter stainless steel tubing.
      b. Multiple fitting assemblies: Mount fittings together in easily accessible location.
      c. Use standard hydraulic-type grease supply fittings:
         1) Manufacturers: One of the following or equal:
            a) Alemite.
            b) Zerk.

D. Ratings: In accordance with ABMA 9 or ABMA 11 L10 life for bearings rating life of not less than 50,000 hours.

2.02 ASSEMBLY FASTENERS

A. General service: Stainless steel, Type 316:
   1. Bolts: In accordance with ASTM F593, Alloy Group 2.
   2. Nuts: In accordance with ASTM F594, Alloy Group 2.
   3. Washers: Alloy group matching bolts and nuts.

B. High-temperature service or high-pressure service: Stainless steel, Type 316:
   1. Bolts: In accordance with ASTM A193, Grade B8M, Class 1, heavy hex.
   2. Nuts: In accordance with ASTM A194, Grade 8, heavy hex.
   3. Washers: Alloy group matching bolts and nuts.

C. Low-temperature service: Stainless steel, Type 316:
   1. Bolts: In accordance with ASTM A320, Grade B8M, Class 1, heavy hex.
   2. Nuts: In accordance with ASTM A194, Grade B8M, heavy hex.
   3. Washers: Alloy group matching bolts and nuts.

2.03 GUARDS AT MOVING COMPONENTS

A. On rotating components that are within 7.5 vertical feet of an operating floor or platform.

B. Allow visual inspection of moving parts without removal.

C. Allow access to lubrication fittings.

D. Easily removable for maintenance.

E. Prevent entrance of rain or dripping water for outdoor locations.

F. Size belt and sheave guards to allow for installation of sheaves 15 percent larger and addition of 1 belt.

G. Materials:
   1. Sheet metal: Carbon steel, 12-gauge minimum thickness, hot-dip galvanized after fabrication.
   2. Fasteners: Type 316 stainless steel.

2.04 SHOP FINISHES

A. Manufacturer's standard primer and finish coatings.
   1. Primer only if field coatings are to be applied.

2.05 SHIPPING

A. Prior to shipment of equipment:
   1. Bearings (and similar items):
      a. Pack separately or provide other protection during transport.
      b. Greased and lubricated.
   2. Gear boxes:
      a. Oil filled or sprayed with rust preventive protective coating.
   3. Fasteners:
      a. Inspect for proper torques and tightness.

PART 3 EXECUTION

3.01 PRE-INSTALLATION

A. Field measurements:
   1. Prior to Shop Drawings preparation, take measurements and verify dimensions indicated on the Drawings.
   2. Ensure equipment and ancillary appurtenances fit within available space.

B. Sequencing and scheduling:
   1. Coordinate details of equipment with other related parts of the Work, including verification that structures, piping, wiring, and equipment components are compatible.
   2. Equipment anchoring: Obtain anchoring material and setting drawings from equipment manufacturers in adequate time for templates to be constructed and anchors to be cast-in-place.

3.02 EQUIPMENT SUPPORT AND ANCHORING TO STRUCTURES

A. Anchor equipment to structures as indicated on the Drawings and as specified.

B. Obtain final anchor bolt layouts for equipment prior to:
   1. Detailing reinforcement for equipment pads.
   2. Preparation of Shop Drawings for metal structures supporting equipment.

C. Anchor bolt templates:
   1. Provide templates as specified in the Technical Sections.
   2. Use final anchor bolt layout to construct templates for setting anchor bolts.
   3. Make templates:
      a. Rigid, and non-deformable during use.
      b. With longitudinal axes of anchors parallel.
      c. With longitudinal axes of anchors perpendicular to surface supporting the equipment.
   4. Templates may be reused for multiple locations of the same equipment only if:
      a. Templates are in “like-new” condition prior to each reuse.
      b. Anchor layout has not been deformed or damaged by previous installation, removal, or handling of templates.

D. Anchor adjustment sleeves:
   1. Use of adjustment sleeves around anchors:
      a. Is at the option of the Contractor.
      b. Does not relieve the Contractor of obligation to construct and use templates for setting of anchors.
      c. May required increased anchor embedment length to develop the strength of the anchor in the embedded length below the adjustment sleeve.
   2. Submittal requirements for anchor adjustment sleeves:
      a. Provide within sufficient time for Engineer approval and not less than 10 working days before setting those items.
      b. Proposed locations of sleeves.
      c. Details and dimensions of sleeves.
      d. Sleeve materials of construction, and coatings.
      e. Information on sleeve filler material and means of filler removal.
      f. Type, details, and dimensions of anchor bolts or anchor rods to be used with sleeves.
      g. Calculations showing development of anchor load capacity below the bottom of the sleeve.
      h. Plan for removal of sleeve fillers, if any.
      i. Plan for placement and consolidation of flowable grout inside sleeves and to a level equal to top of concrete slab or equipment pad surrounding the sleeve.

3.03 FIELD FINISHES

A. When touchup or repair is required, apply primer and coating systems as recommended by the equipment manufacturer.

END OF SECTION

SECTION 46_23_55

GRIT COLLECTOR RAKE ARM

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Rake arm for grit collection mechanism.

B. As specified in Section 46_05_10 - Common Work Results for Mechanical Equipment.

1.02 REFERENCES

A. American Bearing Manufacturers Association (ABMA):
   1. 9 - Load Ratings and Fatigue Life for Ball Bearings.

B. American Gear Manufacturers Association (AGMA):
   1. 908 - Information Sheet - Geometry Factors for Determining the Pitting Resistance and Bending Strength of Spur, Helical, and Herringbone Gear Teeth.
   2. 915-1 - Inspection Practices - Part 1: Cylindrical Gears - Tangential Measurements.
   3. 915-2 - Inspection Practices - Part 2: Cylindrical Gears - Radial Measurements.
   4. 2001 - Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth.
   5. 2004 - Gear Materials, Heat Treatment and Processing Manual.
   6. 2009 - Bevel Gear Classification, Tolerances and Measuring Methods.
   7. 2011 - Cylindrical Wormgearing Tolerance and Inspection Methods.
   8. 2015-1 - Accuracy Classification System - Tangential Measurements for Cylindrical Gears.
   9. 2015-2 - Accuracy Classification System - Radial Measurements for Cylindrical Gears.
   10. 6013 - Standard for Industrial Enclosed Gear Drives.
   11. 6022 - Design Manual for Cylindrical Wormgearing.
   12. 6034 - Practice for Enclosed Cylindrical Wormgear Speed Reducers and Gearmotors.
   13. 9005 - Industrial Gear Lubrication.

C. American Institute of Steel Construction (AISC):
   1. 360 - Specification for Structural Steel Buildings.

D. American Society of Mechanical Engineers (ASME):
   1. B29.1M - Precision Power Transmission Roller Chains, Attachments, and Sprockets.

E. American Welding Society (AWS):
   1. D1.6 - Structural Welding Code - Stainless Steel.

F. ASTM International (ASTM):
   1. A36 - Standard Specifications for Carbon Structural Steel.A48 - Standard Specification for Gray Iron Castings.
   2. A148 - Standard Specification for Steel Castings, High Strength, for Structural Purposes.
   3. A276 - Standard Specification for Stainless Steel Bars and Shapes.
   4. A536 - Standard Specification for Ductile Iron Castings.
   5. F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength.

G. International Organization for Standardization (ISO):
   1. 53 - Cylindrical Gears for General and Heavy Engineering - Standard Basic Rack Tooth Profile.

H. NACE International (NACE).

I. National Electrical Manufacturers Association (NEMA):
   1. 250 - Enclosures for Electrical Equipment (1,000 V Maximum).

J. Society for Protective Coatings (SSPC):
   1. SP 1 -Solvent Cleaning.
   2. SP 5 - White Metal Blast Cleaning.
   3. SP 10 - Near-White Metal Blast Cleaning.

1.03 TERMINOLOGY

A. The words and terms listed below are not defined terms that require initial capital letters, but, when used in this Section have the indicated meaning.
   1. Continuous operation: 24 hour-per-day operation for design life of not less than 20 years which equals 175,200 hours.
   2. Continuous running torque:
      a. The 100 percent AGMA torque, assumed to be continuously applied, 24 hours a day, to the drive system.
      b. Bearing life, gear strength, gear durability, gear rating, mechanism structural design, and alarm and shutdown setpoints are specified as a percentage of the continuous running torque.
   3. Fabricator:
      a. Firm responsible for the fabrication of grit collection equipment conforming to the manufacturer’s design.
   4. Intermittent operation: Periodic operation, including starts and stops, and prolonged periods of resting.
   5. Manufacturer:
      a. Firm responsible for the design, operation, delivery, installation certification, and warranty of grit collection equipment.
      b. Manufacturer shall also provide grit collector drive mechanism.
   6. Momentary peak torque:
      a. The maximum torque for rating yield strength or ultimate strength of center drive mechanism components.

b. The numerical value for momentary peak torque shall be 2.0 times continuous running torque.
7. Set: Equipment necessary to completely furnish 1 grit collector.
8. Subassemblies: Includes, but may not be limited to, complete center column, drive cage, drive assembly, truss arms, and scum skimming system:
   a. Manufacturer may also be the fabricator if fabrication of all components is self-performed.

1.04 SUBMITTALS

A. Submit as specified in Submittal Procedures.

B. Commissioning Submittals:
1. As specified in this Section and in Section 01_75_17 - Commissioning, including the following:
   a. Manufacturer's representative qualifications.
   b. Certificates.
      1) Requirements as specified in this Section.
   c. Test Plans.
      1) Test requirements as specified in this Section.
   d. Test Reports.
   e. Manufacturer's representatives field notes and data.

C. As specified in Section 01_60_01 - Product Requirements.
1. Shop Drawings:
   a. Rake arm indicating dimensions, member sizes and thicknesses, welding, and connection details.
   b. Setting drawings, templates, and directions for the installation of anchorages.
      1) In addition to the manufacturer supplying installation instructions as specified, the manufacturer shall supply storage procedures for all equipment as required.
      2) Submit design calculations as Shop Drawings prior to the completion of all Shop Drawings.

D. Submit Manufacturer's or designated contract fabrication facility's structural steel fabrication qualifications and information.

E. Field test:
1. Submit method of conducting cutout torque test and verification that method of testing will not impose stresses in any member which exceeds maximum allowable stresses specified in this Section.

1.05 WARRANTY

A. Provide warranty as specified in Section 01_78_36 - Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. As specified in Section 01_60_01 - Product Requirements and Section 46_05_10 - Common Work Results for Mechanical Equipment.

B. All equipment components of the rake arm shall be furnished by the same manufacturer.

C. Manufacturers: One of the following or equal:
   1. Ovivo USA.
   2. Walker Process Equipment.
   3. Westech, Inc.

2.02 DESIGN AND PERFORMANCE CRITERIA

A. Nominal grit collector dimensions:
   1. Diameter: As indicated on the Drawings.
   2. Side water depth: As indicated on the Drawings.
   3. Bottom slope: As indicated on the Drawings.

B. Grit collector mechanism:
   1. Supply as an operational system by a single manufacturer.
   2. Equipment to include, but not be limited to, the following components:
      a. Grit collector truss arms with segmented plow-type scrapers connected to the existing center drive cage.
      b. Other components necessary to provide a complete system.
   3. Process description:
      a. The grit collector mechanism includes a central driving mechanism mounted on a center support pier which supports and rotates a center cage with 2 truss arms.
      b. Grit accumulated in the collector is scraped to a center well for continuous removal.

C. Structural design:
   1. Design the sludge collector mechanism in accordance with AISC 360 except:
      a. Provide a 3/16-inch minimum thickness for all members, except where specifically modified for specified equipment components.
      b. Include stresses in members caused by bending and twisting due to eccentricities in members.
   2. Continuous torque capacity: 1,200,000 inch-pounds.
   3. Slenderness ratio (KL/R) using K value of 1.0 shall not exceed the values specified below:
      a. Tension members not greater than 240.
      b. Compression members not greater than 200.
   4. Base member weights used for design on final full member thickness.
   5. Full member thickness may be used for performing deflection calculations.
   6. Design the center cage and the truss arms as an integral structure. Design the center cage and the connections to the truss arms for the reactions from the truss arms.

7. Do not include live load where its inclusion results in lower stresses in a member under investigation.
8. Seismic loads: Seismic loads in accordance with the building code as specified in Section 01_41_00 - Regulatory Requirements where load and resistance factor design (strength design) is used.
    a. Hydrodynamic loads:
        1) All other elements: Hydrodynamic loads as determined using the seismic criteria specified in Section 01_81_50 - Design Criteria.
    b. Hydrodynamic loads for allowable stress design (alternate design method) shall be equal to the load and resistance factor design loads divided by 1.4.
    c. Seismic loads due to weight of mechanism, as determined using the seismic criteria specified in Section 01_81_50 - Design Criteria. Include the water inside the center column as part of the weight of the center column.
9. Load combinations: Design each structural member of the collector mechanism shall for the most critical load combination resulting from the following load combinations:
    a. Dead load plus live load plus continuous running torque.
    b. Dead load plus live load plus continuous running torque plus seismic load:
        1) Seismic load shall include seismic load from the water inside the collector acting on members of the collector mechanism.
        2) For elements of the collector such as the center column and the influent well, impulsive and convective seismic loads from the water shall be applied appropriately on both the inside and outside surfaces.
        3) These seismic loads shall be in addition to the seismic loads due to the dead loads of the elements.
    c. Dead load plus live load plus torque due to screening grout topping on slab using grit collector mechanism.
    d. Dead load plus live load plus torque due to cutout torque test.
    e. Other load combinations selected by the manufacturer.
    f. Truss arm load cases: Use the following load cases on the truss arms for load combinations:
        1) Equal uniform horizontal load along the full length of both truss arms which results in a combined torque equal to the continuous running torque.
        2) Uniform horizontal loads along the full length of both truss arms which results in 70 percent of the torque from 1 truss arm and 30 percent of the torque from the other truss arm for a combined torque equal to the continuous running torque.
        3) Load on truss arms due to spreading grout topping on slab using grit collector mechanism.
        4) Load on truss arm s due to cutout torque load test.
10. Deflections:
    a. The horizontal deflection of the truss arm, due to truss deflection plus rotational deflection of the center cage for load cases which contain continuous running torque, shall not exceed a deflection equal to the radius of the collector divided by 400 (L/400):
        1) Not more than 60 percent of the total allowable horizontal deflection shall be due to center cage rotation (L/500).

2) Horizontal deflection of the truss arm shall be measured at the end of the grit collection header furthest from the center column.

b. The vertical deflection of the truss arm due to equipment dead load shall not exceed the length divided by 800 (L/800).

11. Seismic design criteria: As specified in Section 01_81_50 - Design Criteria.

2.03 MATERIALS

A. For all components, unless otherwise specified, use the materials of construction specified below.

B. Structural steel:
1. In accordance with ASTM A276, Type 316 stainless steel.

C. Stainless steel, ASTM A276, Type 316:
1. Components or structural shapes which are welded:
a. Materials: Type 316L stainless steel.
b. Manufacturer's shop welds, welding procedures, and welders:
1) Qualified and certified in accordance with the requirements of AWS D1.6.

D. Anchor bolts: Type 316 stainless steel.

E. Fasteners and washers: Type 316 stainless steel, except for bolts which will be removed during installation and any high strength bolts.

F. High strength bolts: Use ASTM F3125, Grade A325 hot-dip galvanized high strength bolts in attaching truss arms to cage, and cage to center drive gear casting.

G. Do not use cadmium plated parts and fasteners.

H. Dissimilar metals:
1. All aluminum components shall be isolated from steel components as specified in Section 05_12_00 – Structural Steel Framing to prevent electrolysis.
2. Where steel comes in contact with dissimilar metals (aluminum, stainless steel, etc.), separate or isolate the dissimilar metals.
a. Make application so that the isolating or protective barrier is not visible in the completed construction.

2.04 GRIT COLLECTOR MECHANISM

A. Grit collector truss arms:
1. Materials: Structural steel.
2. Design:
a. Truss design. Tie rods not permitted.
b. Design with sufficient structural strength to sweep a layer of grit on the collector bottom under its own power.
c. Maintain width of truss arm same as the width of center drive cage to ensure alignment and proper connection.
d. Rigidly connect truss arms to center drive cage.
e. Conform truss arms to slope of tank floor.

f. Use the truss arm to support the segmented scraper blades.

B. Segmented scrapers and squeegees:
1. Scraper blades: Setting similar for each truss:
a. Materials: Structural steel.
b. Sized and spaced so entire circular portion of tank is scraped twice for each revolution of the mechanism.
c. Having a minimum depth of 9-1/2 inches.
2. Squeegees: NSF 61 Certified UHMW.

2.05 SPARE PARTS AND SPECIAL TOOLS

A. As specified in Section 01_60_01 - Product Requirements.

B. Special tools:
1. List of special tools.
a. Describe by words and/or depict by graphics, the use of each tool.

C. Spare parts:
1. Furnish the following spare parts. Include a price list and name, address, and telephone number of local supplier:
a. 100 linear feet of scraper squeegees.

PART 3 EXECUTION

3.01 GENERAL

A. As specified in Section 01_60_01 - Product Requirements and Section 46_05_10 - Common Work Results for Mechanical Equipment.

3.02 PREPARATION

A. Anchoring and bracing to structures:
1. Prepare equipment anchor setting template(s) and use to position anchors during construction of supporting structure(s).
2. Install anchors of type and material indicated on approved anchoring designs.
3. Install anchors with embedment indicated on approved anchoring designs.

3.03 INSTALLATION

A. Install the equipment in accordance with the accepted installation instructions and anchorage details.

B. Field welding:
1. Field weld components as required for installation as indicated on the Drawings.
2. Use welding procedures, welders, and welding operators qualified and certified in accordance with AWS D1.6.
3. Shielded arc welding is required for all field welding and shall conform to the Shop Drawing requirements.

3.04 COMMISSIONING

A. As specified in Section 01_75_17 - Commissioning.

B. Installation Verification:
   1. Furnish Manufacturer's Certificate of Installation Verification.

END OF SECTION

City of SACRAMENTO

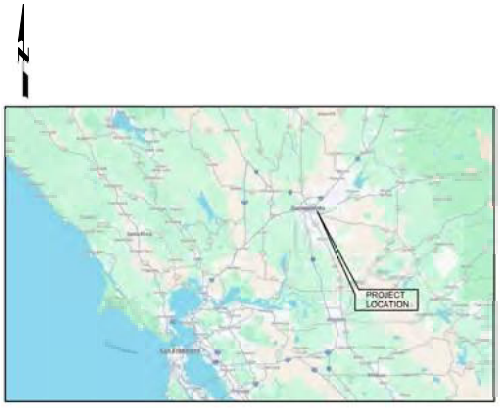
SACRAMENTO DEPARTMENT OF UTILITIES

E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT

ISSUED FOR BID

JANUARY 2025

VOLUME 2 OF 2



VICINITY MAP

SUBMITTED BY:	CARLOS BARRAGAN PROJECT MANAGER DEPARTMENT OF UTILITIES	01/08/2026 DATE
APPROVED BY:	MICHELLE CARREY R.C.E 95872 SUPERVISING ENGINEER DEPARTMENT OF UTILITIES	01/14/2026 DATE
APPROVED BY:	RYAN PALMER SUPERVISING PLANT OPPERATOR DEPARTMENT OF UTILITIES	01/15/2026 DATE

LOCATION MAP

carollo

JOB NO.
203094

DRAWING NO.
00G01

SHEET NO.
1 OF 10

LAST SAVED BY: KJackson

PROJECT NO: 203094-100000 FILE NAME: 203094_00G01.dwg

SHEET NO.	DRAWING NO.	DESCRIPTION
1	00G01	COVER SHEET
2	00G02	DRAWING INDEX
3	00G03	ABBREVIATIONS
4	00G04	NOTES, LEGEND, & SYMBOLS
5	00G05	FACILITY PLAN AREA DESIGNATION & PROJECT DESCRIPTION
6	00D01	GRIT BASIN PLAN
7	00D02	RAKE ARM PLAN, SECTIONS & PHOTOS
8	00SM01	EXISTING GRIT BASIN RECORD DRAWING
9	00SM02	RAKE ARM PLAN & SECTIONS
10	00TS01	STRUCTURAL TYPICAL DETAILS

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED CE
DRAWN CE
CHECKED MED
DATE JANUARY 2025

SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR
RAKE ARM REPLACEMENT
GENERAL
DRAWING INDEX

VERIFY SCALES
BARS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00G02
SHEET NO. 2 OF 10

LAST SAVED BY: KJackson

PROJECT NO: 203094-100000 FILE NAME: 203094_00G02.dwg

@	AT (MEASUREMENT)
∆	DEFLECTION ANGLE, CENTRAL ANGLE
#	NUMBER (REBAR Ø)

A

AB	ANCHOR BOLT
ABC	AGGREGATE BASE COURSE
ABS	ACRYLONITRILE BUTADIENE STYRENE
AC	ASPHALTIC CONCRETE
ACB	AIR CIRCUIT BREAKER
ACI	AMERICAN CONCRETE INSTITUTE
ACP	ASBESTOS CEMENT PIPE
ACU	AIR CONDITIONING UNIT
AD	AREA DRAIN
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJUST, ADJUSTABLE
ADMIN	ADMINISTRATION
ADR	ACCESS DOOR
AED	AREA EQUIPMENT DRAIN
AER	AERATION(OR)
AFC	AFTERCOOLER
AFF	ABOVE FINISHED FLOOR
AFM	AIR FLOW MONITOR
AHU	AIR HANDLING UNIT
AIC	AIR COMPRESSOR
AIL	AIR INTAKE LOUVER
ALT	ALTERNATE
AL	ALUMINUM
ANCH	ANCHOR
ANV	ANGLE VALVE
APPROX	APPROXIMATE, APPROXIMATELY
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AV	ACID VENT
AVG	AVERAGE
AVV	AIR AND VACUUM VALVE
AW	ACID WASTE

B

BC	BEGIN CURVE, BRASS CAP, BACK OF CURB, BOLT CIRCLE
BCKR	BACKER BOARD
BCM	BATCHMETER
BD	BOARD
BDD	BACKDRAFT DAMPER
BDR	BASIN DRAIN LINE
BF	BLIND FLANGE
BFG	BELOW FINISHED GRADE
BFP	BELT FILTER PRESS
BFV	BUTTERFLY VALVE
BG	BREAK GLASS HAND SWITCH
BKW	BACKWASH
BLDG	BUILDING
BLK	BLOCK
BLKHD	BULKHEAD
BLR	PROCESS BLOWER
BM	BEAM, BENCH MARK
BO	BOTTOM OF
BOTT	BOTTOM
BOTTS	BOTTOM SLUDGE
BPV	BACK PRESSURE VALVE
BRG	BEARING
BSP	BLACK STEEL PIPE
BTU	BRITISH THERMAL UNITS
BTWN	BETWEEN
BV	BALL VALVE
BWCCP	BAR-WRAPPED CONCRETE CYLINDER PIPE

C

C	CLOSE, CONDUIT CHANNEL (STRUCTURAL)
CA	CONCRETE ANCHOR
CAUSTIC	CAUSTIC SOLUTION (CONCENTRATED OR DILUTE)
CB	CATCH BASIN
CC	CENTER OF CURVATURE, CENTER TO CENTER
CCB	CHLORINE CONTACT BASIN
CD	CEILING DIFFUSER, CONDENSATE DRAIN
CDL	CHEMICAL DRAIN LINE
CDT	CONDUIT
CEF	CEILING EXHAUST FAN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHEMD	CHEMICAL DRAIN
CHF	CHEMICAL FEEDER
CHKD PL	CHECKERED PLATE
CI	CAST IRON
CIP	CAST IRON PIPE
CIRC	CIRCUMFERENTIAL/CIRCUMFERENCE
CJ	CONSTRUCTION JOINT
CKA	CHECK VALVE, ANGLE
CKB	CHECK VALVE, BALL
CKF	CHECK VALVE, FLAP
CKS	CHECK VALVE, SWING
CL	CENTER LINE
CLK	CHAIN LINK
CLD	CHLORINE LEAK DETECTOR
CLL	CHLORINE LIQUID
CLP	CHLORINE GAS (PRESSURE)
CLR	CLEAR
CLS	CHLORINE SOLUTION
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLV	CHLORINE GAS (VACUUM)
CML	CEMENT MORTAR LINED
CMLC	CEMENT MORTAR LINED AND COATED
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNV	CONVEYOR
CO	CLEANOUT
COL(S)	COLUMN(S)
CONC	CONCRETE
CONN	CONNECT, CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS OR CONTINUATION OR (D) (OUS)
CORR	CORRUGATED(D), CORROSION
CP	CONTROL POINT
CPLG	COUPLING
CPT	CARPET
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL, CIRCULATING SLUDGE
CSP	CHEMICAL SUMP PUMP, CORRUGATED STEEL PIPE
CT	CURRENT TRANSFORMER, CERAMIC TILE

CTJ	CONTROL JOINT
CTL	CONTROL
CTR	CENTER, CENTERED
CTSK	COUNTERSUNK
CU	CUBIC
CUP	COPPER PIPE
CV	CHECK VALVE
CW	COLD WATER
CWV	COMBINATION WASTE AND VENT
CY	CUBIC YARD

D

D	DEPTH, DIGITAL OR DISCRETE, DRAIN
DAW	DRIVEWAY
DBL	DOUBLE
DDR	DESICCANT DRYER
DEG or °	DEGREE
DEMO	DEMOLISH, DEMOLITION
DET	DETAIL
DFL	DECANT/FILTRATE
DG	DOOR GRILLE
DIA or Ø	DIAMETER
DIAG	DIAGONAL
DIF	DIFFUSER
DIG	DIGESTER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIW	DEIONIZED WATER
DL	DEAD LOAD, DRAIN LINE
DLV	DOOR LOUVER
DMP	DAMPER
DMS	DIAPHRAGM SEAL
DN	DOWN
do	DITTO
DO	DOOR OPENING
DP	DEEP (OR DEPTH)
DPV	DIAPHRAGM VALVE
DR	DOOR, DRAIN
DRT	DRIP TRAP
DRV	DRAIN VALVE
DS	DIGESTED SLUDGE, DOWN SPOUT
DSW	DISTILLED WATER, DOOR SWITCH
DUC	DUST COLLECTOR
DUH	DUCT HEATER UNIT
DW	DISTILLED WATER
DWD	DEWATERING DRAIN
DWG(S)	DRAWING(S)
DWL(S)	DOWEL(S)

E

E	EAST
EA	EACH
EC	END OF CURVE
ECC RED	ECCENTRIC REDUCER
ECU	EVAPORATOR COOLING UNIT
ED	EQUIPMENT DRAIN
EF	EXHAUST FAN, EACH FACE
EFF	EFFLUENT
EG	EXHAUST GRILLE
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
EJR	INJECTOR/EDUCTOR
EL	ELEVATION
ELEC	ELECTRICAL
ELL	ELBOW
EMBED	EMBEDMENT
EMH	ELECTRICAL MANHOLE
EP	EDGE OF PAVEMENT
EPS	EXPANDED POLYSTYRENE
EPV	ECCENTRIC PLUG VALVE
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXHAUST REGISTER
ES	EACH SIDE
ESEW	EMERGENCY SHOWER AND EYE WASH
ESMT	EASEMENT
ESS	EMERGENCY HAND SWITCH
ET	ELECTRICALLY HEAT TRACED
EUH	ELECTRIC UNIT HEATER
EVR	EVAPORATOR
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWEF	EACH WAY EACH FACE
EWH	ELECTRIC WATER HEATER, EXHAUST
EX	EXISTING
EXIST	EXISTING
EXP	EXPANSION, EXPANSION TANK
EXPO	EXPOSED
EXT	EXTERIOR

F

FACT	FACTORY
FAD	FOUL AIR DUCT
FB	FLAT BAR
FBW	FILTER BACKWASH
FC	FACE OF CURB, FLEXIBLE COUPLING
FCA	FLANGE COUPLING ADAPTER
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER, FLOOR DRAIN, FOUND
FDC	FIRE DEPARTMENT CONNECTION
FDL	FLOOR DRAIN LINE
FDR	FEEDER
FEFF	FINAL EFFLUENT
FG	FLAP GATE
FH	FIRE HYDRANT
FILT	FILTRATE
FIN	FINISH
FIN FL	FINISHED FLOOR
FIN GR	FINISHED GRADE
FL	FLOOR, FLOW LINE
FLA	FOUL AIR
FLD	FILTER DRAIN
FLE	FILTER EFFLUENT
FLEX	FLEXIBLE
FLG	FLANGE, OR FLANGED
FLR	FILTER
FM	FORCE MAIN
FND	FOUNDATION
FO	FUEL OIL
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP

FPM	FEET PER MINUTE
FPP	FLEXIBLE PLASTIC PIPE
FRP	FIBERGLASS REINFORCED PLASTIC
FRPP	FIBERGLASS REINFORCED PLASTIC PIPE
FRS	FROTH SPRAY
FS	FAR SIDE
FSTN	FASTENER(D)
FT or '	FOOT, FEET
FTG	FOOTING
FUP	FUEL DISPENSER
FV	FLAP VALVE
FW	FLUSHING WATER, FINISHED WATER
FX	FIRE EXTINGUISHER
FXC	FIRE EXTINGUISHER CABINET
FXE	FIRE EXTINGUISHER - ELECTRICAL

G

G	GAS, GROUND, GUTTER
GA	GAUGE or GAGE
GAL	GALLONS
GALV	GALVANIZED(D)
GAV	GRAVITY VENTILATOR
GB	GRADE BREAK
GBT	GRAVITY BELT THICKENER
GC	GROOVED COUPLING
GEL	GRAVITY EXHAUST LOUVER
GEN	GENERAL, GENERATOR
GL	GLASS
GLV	GLOBE VALVE
GM	GAS METER
GND	GROUND
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GRV	GRAVITY VENTILATOR
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GYP	GYPSUM

H

H	EXPLOSION-PROOF, HIGH, HORIZONTAL
H1E	HOOK ONE END
H2E	HOOK TWO ENDS
HAS	HEADED ANCHOR STUD
HB	HOSE BIBB
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HARDWARE
HDWL	HEADWALL
HEF	HOOD EXHAUST FAN
HGT	HEIGHT
HORIZ	HORIZONTAL
HP	HEAT PUMP, HORSEPOWER, HIGH PRESSURE
HPA	HIGH PRESSURE AIR
HPT	HIGH POINT
HPU	HEAT PUMP UNIT AIR
HR	HANDRAIL, HOSE REEL, HOUR
HSF	HOOD SUPPLY FAN
HSS	HOLLOW STRUCTURAL SECTION (STEEL)
HTX	HEAT EXCHANGER
HV	HOSE VALVE
HW	HOT WATER
HWL	HIGH WATER LEVEL
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HW	HEIGHT BY WIDTH
HYD	HYDRANT

I

IA	INSTRUMENT AIR
ID	INSIDE DIAMETER, INSIDE DIMENSION, IDENTIFICATION
I.F.	INSIDE FACE
IN or "	INCH(ES)
INCL	INCLUDE, INCLUDING
INF	INFLUENT
INJ	INJECTOR
INSTR	INSTRUMENTATION
INSUL	INSULATE(D)(ED)(ING)(ION)
INT	INTERIOR
INV	INVERT
IP	IRON PIPE
ISR	INTRINSICALLY SAFE RELAY

J

JST	JOIST
JT	JOINT

K

KGV	KNIFE GATE VALVE

L

L	ANGLE (STRUCTURAL), LENGTH, LOUVER
LAB	LABORATORY
LAV	LAVATORY
LB(S)	POUND(S)
LDF	LIQUID DIESEL FUEL
LDFR	LIQUID DIESEL FUEL RETURN
L.F.	LINEAL FEET
LG	LONG
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LHRA	LEFT HAND REVERSE ACTIVE
LHRB	LEFT HAND REVERSE BEVEL
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW PRESSURE
LPA	LOW PRESSURE AIR
LPG	LIQUIFIED PROPANE GAS
LPT	LOW POINT
LR	LONG RADIUS
LS	LAB SINK
LT	LEFT
LWL	LOW WATER LEVEL

M

M	MOTOR
MAINT	MAINTENANCE
MAN	MANUAL
MASY	MASONRY
MATL	MATERIAL
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MB	MACHINE BOLT

MC	MECHANICAL COUPLING
MCJ	MASONRY CONTROL JOINT
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MGL	MILLIGRAMS PER LITER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MIX	MIXER
MJ	MECHANICAL JOINT
MK	MARK
ML	MIXED LIQUOR
MO	MASONRY OPENING
MOD	MODIFIED
MOIST	MOISTURE
MON	MONUMENT
MOS	MOISTURE SEPARATOR
MPM	METERING PUMP
MS	MOP SINK
MTD	MOUNTED

N

N	NORTH, NEUTRAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEV	VALVE, NEEDLE
NG	NATURAL GRADE, NATURAL OR LP GAS
NIC	NOT IN CONTRACT
NO. #	NUMBER
NOM	NOMINAL
NPT	NATIONAL PIPE THREAD
NPW	NON-POTABLE WATER
NS	NEAR SIDE
NTS	NOT TO SCALE

O

O	OPEN
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OUTSIDE DIMENSION
OED	OPEN EQUIPMENT DRAIN
OF.	OUTSIDE FACE
OFL	OVERFLOW
OPNG	OPENING
OPP	OPPOSITE
OPP HND	OPPOSITE HAND
OZ	OUNCE

P

P	POLE
PBL	POLYMER BLENDER
PC	POINT OF CURVATURE
PCC	PLANT CONTROL CENTER
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCP	PROGRESSIVE CAVITY PUMP
PD	POSITIVE DISPLACEMENT, PLANT DRAIN
PD, PLD	PULSATION DAMPENER
PDP	POSITIVE DISPLACEMENT PUMP
PE	PLAIN END
PERP	PERPENDICULAR
PG	PRESSURE GAUGE
PH	PHASE, PHYSICALLY HANDICAPPED
PI	POINT OF INTERSECTION
PIV	POST INDICATOR VALVE
PL	PLATE, PROPERTY LINE
PLAS	PLASTIC
PLCS	PLACES
PLS	POLYMER SOLUTION
PLWD	PLYWOOD
PMP	PUMP
PNL(S)	PANEL(S)
POL	POLYMER
POLY	POLYETHYLENE
POS	POSITION
POW	POTABLE WATER
PP	POWER POLE
PPMV	PARTS PER MILLION (VOLUME)
PRC	POINT OF REVERSE CURVATURE
PREFAB	PREFABRICATED
PRG	PRESSURE REGULATOR
PRI	PRIMARY
PROJ	PROJECTION
PRR	PRESSURE OR VACUUM RELIEF VALVE
PRV	PRESSURE REDUCING VALVE, PRESSURE REGULATION VALVE, PRESSURE RELIEF VALVE
PS	PUMP STATION, PIPE SUPPORT
PSF	POUNDS PER SQUARE FOOT
PSG	PRESSURE GAUGE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	POINT, POINT OF TANGENCY
PV	PLUG VALVE
PVC	POINT OF VERTICAL CURVATURE, POLYVINYL CHLORIDE
PVDF	POLYVINYLIDENE FLUORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
PLW	PLANT WATER

Q

QTY	QUANTITY

R

R	RISER
R/W or R.O.W.	RIGHT OF WAY
RAD	RADIUS, RADIAL
RAS	RETURN ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RD	ROOF DRAIN
RDL	ROOF DRAIN LINE
RDOF	ROOF DRAIN OVERFLOW
RECIRC	RECIRCULATING
RED	REDUCER, ROOF EQUIPMENT DRAIN
REF	REFERENCE
REG	REGULATOR, REGULATING
REINF	REINFORCED(DING)(MENT)
REJ	RUBBER EXPANSION JOINT
REQD	REQUIRED

RER	REACTOR
RES	RESERVOIR
REV	REVISION, REVERSE
RF	RETURN FAN
RG	RETURN GRILLE RUBBER GASKET
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
RHRA	RIGHT HAND REVERSE ACTIVE
RHRB	RIGHT HAND REVERSE BEVEL
RLS	REGISTERED LAND SURVEYOR
RM	ROOM
RO	ROUGH OPENING
ROT	ROTAMETER
RP	RADIUS POINT
RPM	REVOLUTIONS PER MINUTE
RPMP	REINFORCED PLASTIC MORTAR PIPE
RR	RETURN REGISTER
RT	RIGHT
RTF	ROTARY FEEDER
RTU	ROOF TOP UNIT
RUD	RUPTURE DISK
RW	RECLAIMED WATER, REUSE WATER
RWR	RECLAIMED WATER RETURN
RWW	RAW WASTEWATER

S

S/W	SIDEWALK
S	SOUTH, SWITCH, SLOPE
SA	SAMPLE
SC	SECONDARY CLARIFIER
SCB	SCRUBBER
SCD	SMOKE CONTROL DAMPER
SCFM	STANDARD CUBIC FEET PER MINUTE
SCH	SCHEDULE
SCO	SURFACE CLEANOUT
SCR	BAR SCREEN
SCR	SILICON CONTROL RECTIFIER
SD	SMOKE DETECTOR, SPLITTER DAMPER, STORM DRAIN
SDL	SUMP DISCHARGE DRAIN LINE
SDO	SLUDGE DRAWOFF
SE	SECONDARY EFFLUENT
SEC	SECONDARY, SECOND
SECT	SECTION
SED	SEDIMENTATION
SEP	SEPTAGE
SF	SUPPLY FAN
SFW	SOFTENED WATER
SG	SUPPLY GRILLE
SGS	STORE FRONT GLAZING SYSTEM
SHD	SHOWER DRAIN
SHDR	SOLIDS HANDLING-RECYCLE
SHR	SHOWER
SHT	SHEET
SIM	SIMILAR
SK	SKIMMINGS
SL	SLOPE, SLUDGE
SLC	SLUDGE COLLECTOR DRIVE
SLG	SLIDE GATE
SLV	SLEEVE VALVE
SMP	SAMPLER, SUMP PUMP
SN	SUPERNATANT OR SUBNATANT
SOL	SOLUTION
SP	STATIC PRESSURE, SET POINT
SPD	SUMP PUMP DRAIN
SPDT	SINGLE POLE DOUBLE THROW
SPEC(S)	SPECIFICATION(S)
SPH	SPLITTER BOX
SPR	SPARE
SPS	SAMPLE SINK
SPW	SAMPLE WATER
SQ	SQUARE
SQ FT	SQUARE FEET
SQ IN(S)	SQUARE INCH(ES)
SR	SHOOT RADIUS, SUPPLY REGISTER
SRL	SCRUBBER RECIRCULATION LIQUID (CAUSTIC)
SS	SANITARY SEWER, SELECTOR SWITCH
SSK	SERVICE SINK
SSL	SECONDARY SLUDGE
SST	STAINLESS STEEL
ST	SLUDGE TRANSFER
STA	STATION
STB	STABILIZER
STD(S)	STANDARDS(S)
STIFF	STIFFENER
STIR	STIRRUPS
STL	STEEL
STM	STEAM
STP	STEP, PIPE
STR	STRAINER
STRUCT	STRUCTURAL
SUG	SLUDGE GATE
SUPT	PIPE SUPPORT, SUPPORT
SV	SERVICE VALVE, SHUTOFF VALVE, SOLENOID VALVE
SW	SANITARY WASTE
SWR	SEAL WATER
SYM	SYMMETRICAL
SYN	SYNTHETIC

T

T	TANGENT LENGTH, THERMOSTAT, TIMER, TREAD
T&B	TOP AND BOTTOM
TAS	THREADED ANCHOR STUD
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TCV	TEMPERATURE CONTROL VALVE
TDH	TOTAL DYNAMIC HEAD
TDR	TIME DELAY RELAY, TOWEL DISPENSER/RECEPTACLE
TEL	TELEPHONE
TH	TEST HOLE
THK	THICKENER, THICKNESS, THICK
TKS	THICKENED SLUDGE
TLV	TELESCOPING VALVE
TMH	TELEPHONE MANHOLE
TMP	TEMPERATURE
TNK	TANK
T.O.	TOP OF
TOC	TOP OF CONCRETE
TOG	TOP OF GRATING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL

T.O.W.	TOP OF WALL
TR	TRIAD (THREE CONDUCTOR SHIELDED CABLE), TIMING RELAY
TS	THICKENER SUPERNATANT OR SUBNATANT
TSD	THICKENED SLUDGE DECANT
TSPL	TURBIDIMETER SAMPLE
TSTAT	THERMOSTAT
TTB	TELEPHONE TERMINAL BOARD
TUR	TURBINE
TV	TURNING VANES
TWV	THREE-WAY VALVE
TYP	TYPICAL

U

UC	UNDERCUT
UG	UNDERGROUND
UHMWPE	ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE
UHMW	ULTRA HIGH MOLECULAR WEIGHT
UNO	UNLESS NOTED OTHERWISE
US	UTILITY SINK

V

V	VALVE
VAR	VARIES
VB	VALVE BOX
VCP	VITRIFIED CLAY PIPE
VEC	VINYL ESTER COATING
VERT	VERTICAL
VFR	VOLUMETRIC FEEDER
VG	VACUUM GAUGE, VALLEY GUTTER
VOL	VOLUME
VRV	VACUUM REGULATING VALVE
VTR	VENT THROUGH ROOF

W

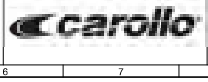
W	WEST, WIDTH
W/	WITH
W/O	WITHOUT
WAS	WASTE ACTIVATED SLUDGE
WCO	WALL CLEANOUT
WEF	WALL EXHAUST FAN
WF	WALL FITTING, WASH FOUNTAIN
WH	WATER HEATER
WI	WEIGHT INDICATOR
WL	WALL LOUVER, WATER LEVEL
WM	WATER METER
WOD	WASTE OIL DRAIN
WP	WEATHERPROOF, WATERPROOF
WPT	WORKING POINT
WRG	WEIR GATE
WRS	WATER SOFTENER
WS	WATER SURFACE
WSTP	WATERSTOP
WT	WALK THROUGH, WEIGHT
WTF	WATER TREATMENT FACILITY
WTP	WATER TREATMENT PLANT
WTR	WATER
WV	WATER CONTROL VALVE
WW	WASTEWATER
WWF	WELDED WIRE FABRIC
WWTF	WASTEWATER TREATMENT FACILITY
WWTP	WASTEWATER TREATMENT PLANT

Y

Y	WYE
YCO	YARD CLEANOUT
YH	YARD HYDRANT

REV	DATE	BY	DESCRIPTION
G			ISSUED FOR BID

DESIGNED CE
DRAWN
CE
CHECKED
MED
DATE
JANUARY 2025



SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR
RAKE ARM REPLACEMENT
GENERAL
ABBREVIATIONS

VERIFY SCALES
BARS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00G03
SHEET NO. 3 OF 10

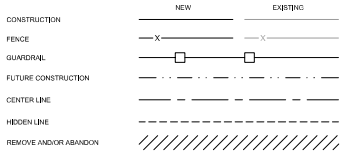
LAST SAVED BY: KJackson

PROJECT NO. 203094-100000 FILE NAME: 203094_00G03.dwg

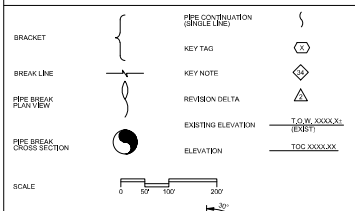
GENERAL NOTES

1. FOLLOWING NOTES ARE GENERAL AND APPLY TO ALL SHEETS OF THESE CONTRACT DOCUMENTS AS IF THEY WERE WRITTEN IN THEIR ENTIRETY ON EACH SHEET.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING CONSTRUCTION AND UTILITIES. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONSTRUCTION BEFORE PROCEEDING WITH WORK.
3. UNLESS DETAILED, SPECIFIED, OR OTHERWISE INDICATED ON THE DRAWINGS, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS SHALL APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS.
4. WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF WORK, DETAILS SHALL BE IN THE SAME AS FOR OTHER SIMILAR WORK.
5. CONTRACTOR SHALL COMPLY WITH LOCAL CONSTRUCTION STORM WATER DISCHARGE REGULATIONS AND REQUIREMENTS.
6. EXISTING FACILITY AND UTILITY INFORMATION SHOWN ON THE DRAWINGS WAS OBTAINED FROM AVAILABLE RECORDS OR ELECTRONIC FILES. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR FACILITIES AND UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS, SIZES, MATERIAL TYPES, AND ELEVATIONS SHOWN AROUND OR NEAR AREAS OF NEW CONSTRUCTION PRIOR TO START OF CONSTRUCTION.
7. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT FROM DAMAGE EXISTING FACILITIES AND UTILITIES SHOWN OR NOT SHOWN THAT ARE TO REMAIN IN PLACE. ALL FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED TO THE ORIGINAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
8. CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING PIPE, EQUIPMENT, ETC, AS REQUIRED AND SHALL PROVIDE ALL FITTINGS, ADAPTERS, AND APPURTENANCES REQUIRED TO MAKE THE CONNECTIONS. PROVIDE ALL SUPPORTS REQUIRED FOR A RIGIDLY SUPPORTED COMPLETE AND WORKING SYSTEM.
9. CONTRACTOR SHALL VERIFY THAT PIPING SHOWN TO BE ABANDONED OR AS ABANDONED PREVIOUSLY IS NO LONGER IN SERVICE. LINES IN SERVICE SHALL BE MAINTAINED UNTIL NO LONGER REQUIRED BY THE PLANT.
10. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS IN THE VICINITY OF ANY OVERHEAD ELECTRIC LINES. CONTRACTOR SHALL ABIDE BY THE NATIONAL ELECTRIC CODE AND ANY REQUIREMENT BY THE OWNER OF THE ELECTRIC LINES.
11. PROVIDE ALL SHEETING/SHORING REQUIRED TO PROTECT EXISTING STRUCTURES, PIPES AND FACILITIES.
12. CONTRACTOR SHALL VERIFY LOCATION OF ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL ITEMS BEFORE PLACING ANY STRUCTURAL STEEL OR CONCRETE. ALSO, STRUCTURAL DIMENSIONS AND OPENINGS CONTROLLED BY ARCHITECTURAL, MECHANICAL, OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

LINE WORK



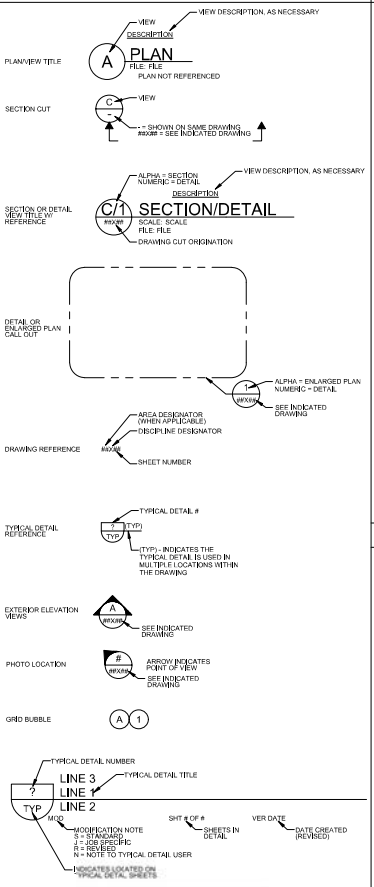
SYMBOLS



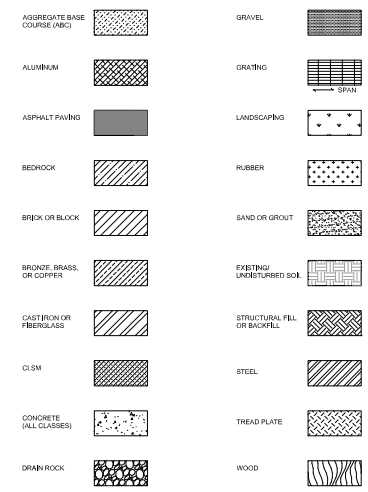
Know what's below. Call before you dig. 811

Avoid overhead power line contact. It's costly.
Call before you
OVERHEAD
1-800-642-2444

DETAIL REFERENCES



HATCH PATTERNS



MISCELLANEOUS

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED CE
DRAWN CE
CHECKED MED
DATE JANUARY 2025

No. 5368 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA

carollo

SACRAMENTO

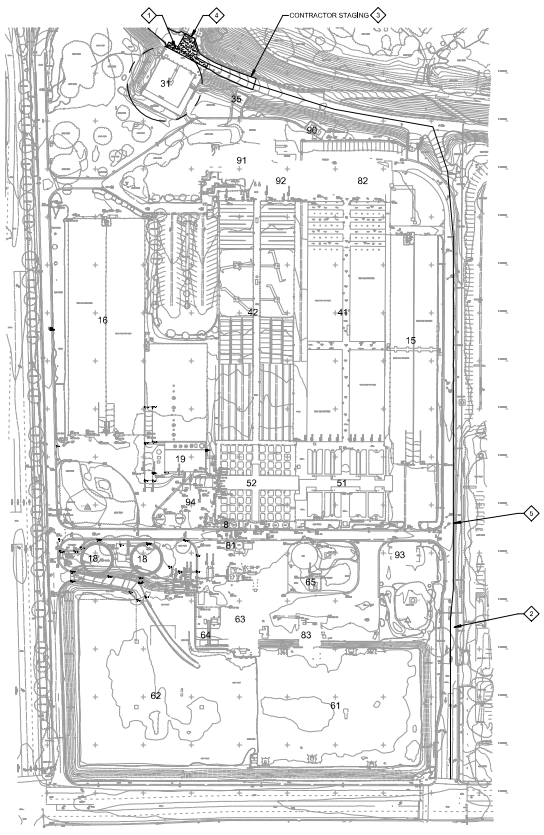
SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
GENERAL
NOTES, LEGEND & SYMBOLS

VERIFY SCALES
BARS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00G04
SHEET NO. 4 OF 10

LAST SAVED BY: KJackson

PROJECT NO. 203094-100000 FILE NAME: 203094_00G04.dwg



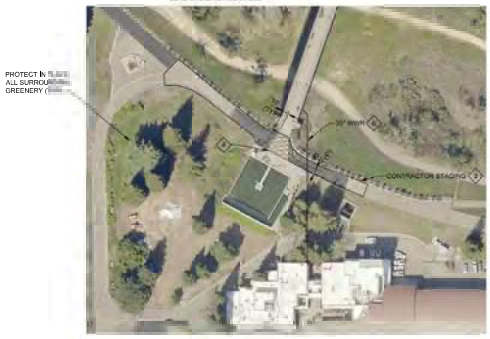
E.A. FAIRBAIRN WATER TREATMENT PLANT SITE

A PLAN
SCALE: 1" = 100'
FILE: 203094_00C100

AREA NO.	E. A. FAIRBAIRN WATER TREATMENT PLANT - AREA NAME	STATUS
8	FLUORIDE FACILITY	EXISTING
10	SITE WORK (GRADING, PAVING, DRAINAGE, YARD PIPING)	EXISTING
14	SRCSD SOUTH CONNECTION VAULT	EXISTING
15	FILTER WASTE WASHWATER LAGOONS	EXISTING
16	SLUDGE LAGOONS	EXISTING
18	GRAVITY THICKENERS AND THICKENED SLUDGE PUMP STATION	EXISTING
19	DEWATERING BUILDING	EXISTING
20	INTAKE	EXISTING
31	**GRIT BASIN**	**MODIFY**
35	INFLUENT METER VAULT	EXISTING
41	FLOCCULATION / SEDIMENTATION BASINS 3 & 4	EXISTING
42	FLOCCULATION / SEDIMENTATION BASINS 1 & 2	EXISTING
51	FILTERS 9-16	EXISTING
52	FILTERS 1-8	EXISTING
61	CT BASIN / CLEARWELL	EXISTING
62	TREATED WATER RESERVOIR	EXISTING
63	HIGH SERVICE PUMP STATION	EXISTING
64	PLANT ELECTRICAL SUBSTATION	EXISTING
65	EFFLUENT METER VAULT	EXISTING
81	LIME SILO STRUCTURE	EXISTING
82	CHEMICAL BUILDING	EXISTING
83	LIME BUILDING	EXISTING
90	NORTH POWER CENTER	EXISTING
91	OPERATIONS BUILDING	EXISTING
92	MAINTENANCE AND CONTROL BUILDING	EXISTING
93	MAINTENANCE STORAGE BUILDING	EXISTING
94	MAINTENANCE SHOP	EXISTING

KEY NOTES: EAFWTP MISCELLANEOUS IMPROVEMENT PROJECTS DESCRIPTION

1. GRIT BASIN, RAKE ARM REPLACEMENT LOCATION. SEE B4- FOR DETAILS
2. ACCESS GATE
3. COORDINATE LIMITS OF CONTRACTOR STAGING, LAYDOWN, AND EMPLOYEE PARKING WITH THE OWNER AND ENGINEER. LIMITS SHOWN ON THIS PLAN ARE APPROXIMATE
4. IF A CRANE OR ANY OUTRIGGER IS WITHIN THIS AREA (THE INTAKE BRIDGE, WITHIN 10' OF THE INTAKE BRIDGE, AND/OR WITHIN 10' OF THE INLET CHANNEL), CONTRACTOR SHALL PROVIDE AN EVALUATION CONFIRMING ADEQUACY TO SUPPORT THE CRANE AND/OR OUTRIGGER, SIGNED AND SEALED BY A CALIFORNIA PROFESSIONAL STRUCTURAL ENGINEER, FOR ENGINEER REVIEW. EVALUATION SHALL INCLUDE SURCHARGE LOAD AND EXISTING WALLS
5. ACCESS ROAD
6. DO NOT STAGE CRANE OR OUTRIGGER ONTO OR WITHIN 5' OF 36" WWR



H SECTION
SCALE: NO SCALE
FILE: Fairbairn 2014 Aerial Photos Page 001.jpg

LAST SAVED BY: KJackson

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED CE
DRAWN CE
CHECKED MED
DATE JANUARY 2025

No. 5368

carollo

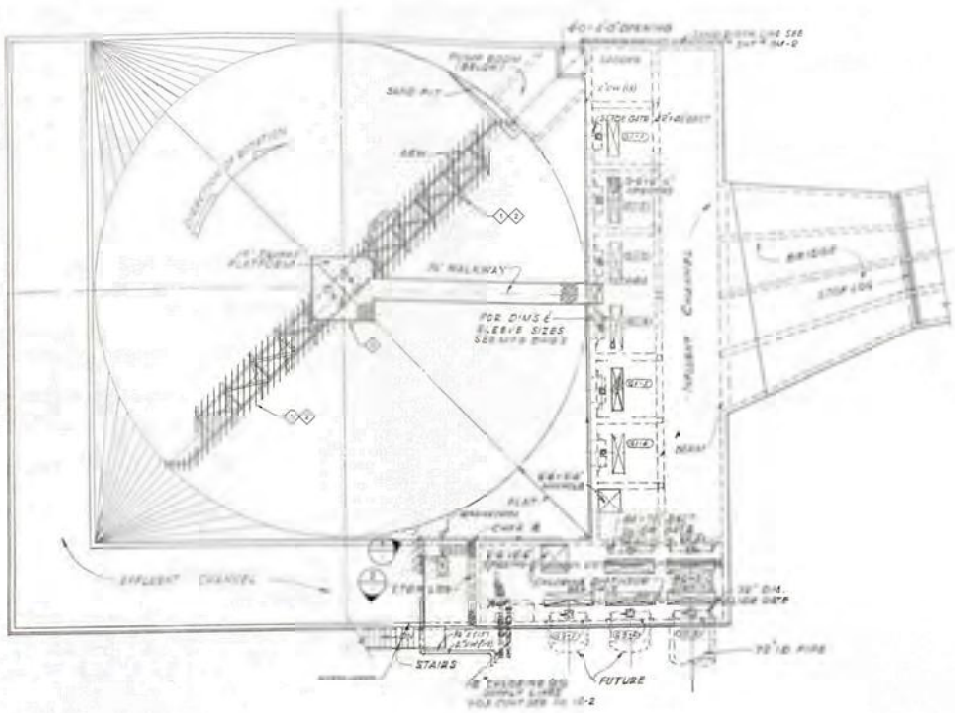
SACRAMENTO

SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
GENERAL
FACILITY PLAN
AREA DESIGNATION & PROJECT DESCRIPTION

VERIFY SCALES
BARS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00G05
SHEET NO. 5 OF 10

PROJECT NO. 203094-100000 FILE NAME: 203094_00G05.dwg



A PLAN

GENERAL NOTES:

1. DIMENSIONS, WALL THICKNESS, FOUNDATIONS, PIPING AND OTHER DETAILS SHOWN ON THESE DRAWINGS WERE TAKEN FROM RECORD DRAWINGS PROVIDED BY THE OWNER. ACTUAL DIMENSIONS MAY VARY.
2. FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, PIPING AND CONDITIONS RELATED TO WORKPRIOR TO DEMOLITION, SHOP DRAWING PREPARATIONAND FABRICATION.
3. NOTIFY ENGINEER IMMEDIATELY IF ANY OF THE FOLLOWING ARE EXPOSED:
   A. SIZES OR DIMENSIONS DIFFERING FROM THE CONTRACT DOCUMENTS
   B. DAMAGE OR DETERIORATION TO MATERIALS AND COMPONENTS
   C. CONDITIONS OR DETAILS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS
3. PROTECT IN PLACE ITEMS THAT ARE NOT DESIGNATED TO BE DEMOLISHED OR MODIFIED. SHOULD SUCH ITEMS BECOME DAMAGED DURING THE WORK, REPLACE IN KIND AT NO COST TO THE OWNER.

(#) KEY NOTES:

1. DEMOLISH ANC REPLACE EXISTING RAKE TRUSS ARM. PROTECT AND MAINTAIN CONNECTIONS FOR ATTACHMENT OF NEW ARM TO EXISTING CAGE. FIELD VERIFY RAKE ARM DIMENSIONS AND CONNECTION DETAILS PRIOR TO FABRICATING NEW ARM
2. SEE SHEET 00B02 FOR RAKE ARM DEMOLITION DETAIL, SECTIONS ANC PHOTOS
3. PROTECT WALKWAY AND ASSOCIATED ELEMENTS IN PLACE

DEMOLISH GUARDRAIL RAILS FOR NEW LADDER, SEE SHEET 00S401. MAKE CUT CLEAN, FREE OF BURS ARD NICKS, AND SMOOTH EDGES

DEMOLISH EXISTING LADDER ENTIRELY

GRIND EXISTING ANCHOR BOLTS [illegible] SURFACE OF CONCRETE WALL CAVITY WITH MI (TYP)

1 PHOTO
SCALE: NO SCALE
FILE: AMI 1DAI

2 PHOTO
SCALE: NO SCALE
FILE: MG 1DN2

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED MES
DRAWN KRJ
CHECKED MED
DATE JANUARY 2025

No. 5568

carollo

City of SACRAMENTO

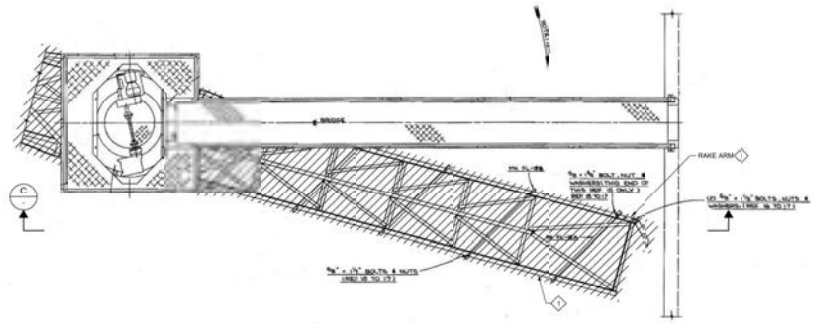
SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
DEMOLITION
GRIT BASIN PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00D01
SHEET NO. 6 OF 10

LAST SAVED BY: KJackson

PROJECT NO. 203094-100000 FILE NAME: 203094_00D01.dwg



B PLAN
SCALE: NO SCALE
FILE: 203094_003M10

C SECTION
SCALE: NO SCALE
FILE: 203094_003M10

1 PHOTO
SCALE: NO SCALE
FILE: 203094_101947

2 PHOTO
SCALE: NO SCALE
FILE: 203094_102139

GENERAL NOTES:

1. DIMENSIONS, WALL THICKNESS, FOUNDATIONS, PIPING AND OTHER DETAILS SHOWN ON THESE DRAWINGS WERE TAKEN FROM RECORD DRAWINGS PROVIDED BY THE OWNER. ACTUAL DIMENSIONS MAY VARY.
2. FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, PIPING AND CONDITIONS RELATED TO WORKPRIOR TO DEMOLITION, SHOP DRAWING PREPARATIONAND FABRICATION.
3. NOTIFY ENGINEER IMMEDIATELY IF ANY OF THE FOLLOWING ARE EXPOSED:
   A. SIZES OR BIMENSIONS DIFFERING FROM THE CONTRACT DOCUMENTS
   B. DAMAGE OR DETERIORATION TO MATERIALS AND COMPONEVTS
   C. CONDITIONS OR DETAILS DIFFERENT FROM THOSE SHWON ON THE DRAWINGS
3. PROTECT IN PLACE ITEMS THAT ARE NOT DESIGNATED TO BE DEMOLISHED OR MODIFIED. SHOULD SUCH ITEMS BECOME DAMAGED DURING THE WORK, REPLACE IN KIND AT NO COST TO THE OWNER.

KEY NOTES:

1. DEMOLISH AND REPLACE EXISTING RAKE TRUSS ARM. PROTECT AND MAINTAIN CONNECTIONS AS REQUIRED FOR ATTACHMENT OF NEW ARM TO EXISTING CAGE. FIELD VERIFY RAKE ARM DIMENSIONS AND CONNECTION BETAILS PRIOR TO FABRICATING NEW ARM
2. PROTECT AND MAINTAIN DRIVE CAGE INCLUDING CONNECTION FOR ATTACHMENT TO NEW ARM. SURFACE PREPARATION FOR COATING INCLUDES REMOVAL OF THICK GREASE ON CAGE
3. PROTECT EXISTING MOTOR AND ASSOCIATED ELEMENTS, ASIDE FROM THE RAKE ARM, IN PLACE

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED: MES
DRAWN: KRJ
CHECKED: MED
DATE: JANUARY 2025

No. 5568

carollo

City of SACRAMENTO

SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR
RAKE ARM REPLACEMENT
DEMOLITION
RAKE ARM PLAN, SECTIONS & PHOTOS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

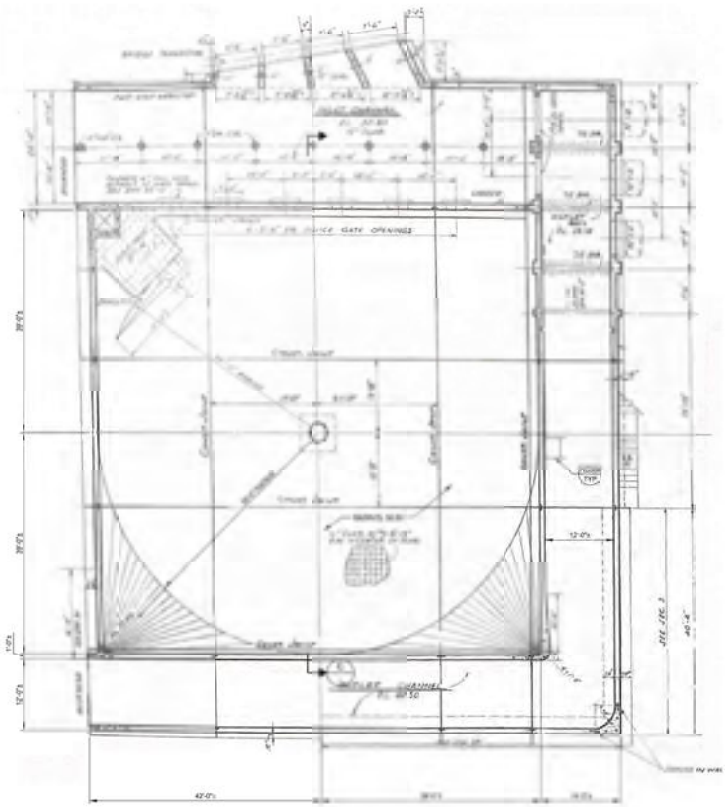
JOB NO. 203094
DRAWING NO. 00D02
SHEET NO. 7 OF 10

LAST SAVED BY: KJackson

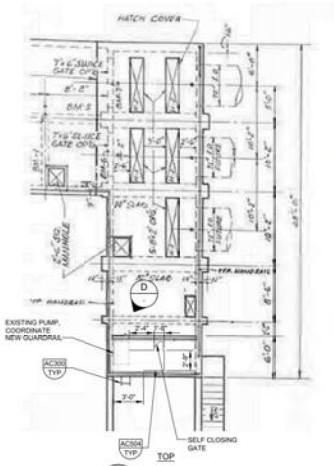
PROJECT NO. 203094-100000 FILE NAME: 203094_00D02.dwg

GENERAL NOTES:

1. DIMENSIONS, WALL THICKNESS, FOUNDATIONS, PIPING AND OTHER DETAILS SHOWN ON THESE DRAWINGS WERE TAKEN FROM RECORD DRAWINGS PROVIDED BY THE OWNER. ACTUAL DIMENSIONS MAY VARY.
2. CONFIRM ALL EXISTING CONDITIONS, NOTIFY ENGINEER IF THERE ARE DISCREPANCIES.

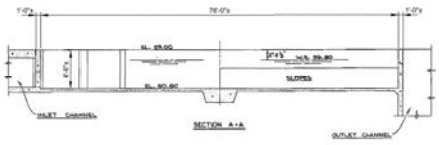


A PLAN
SCALE: NO SCALE
FILE: 203094_005M104



B PLAN
SCALE: NO SCALE
FILE: 203094_005M106

1 PHOTO
SCALE: NO SCALE
FILE: 203094_005M108.jpg



C SECTION
SCALE: NO SCALE
FILE: 203094_005M100

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED: MES
DRAWN: KRJ
CHECKED: MED
DATE: JANUARY 2025

No. 5568

carollo

City of SACRAMENTO

SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
STRUCTURAL/MECHANICAL
EXISTING GRIT BASIN RECORD DRAWING

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00SM01
SHEET NO. 8 OF 10

LAST SAVED BY: KJackson

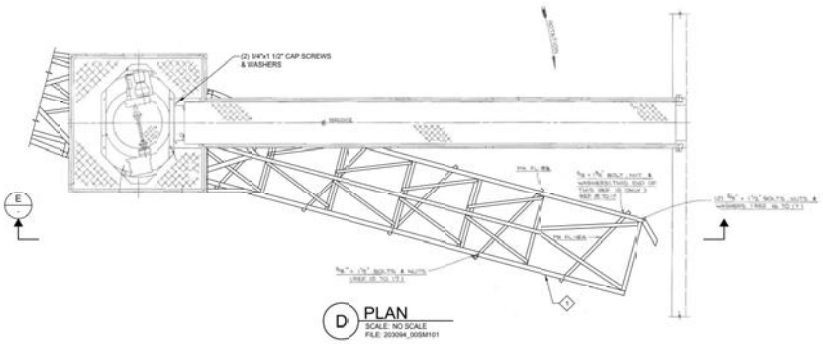
PROJECT NO: 203094-100000 FILE NAME: 203094_005M01.dwg

GENERAL NOTES:

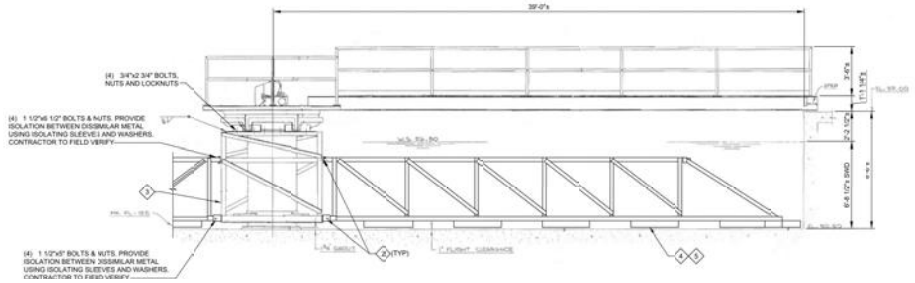
1. SCREENED LINE WORK INDICATES EXISTING CONDITIONS.
2. CONFIRM ALL EXISTING CONDITIONS. NOTIFY ENGINEER IF THERE ARE DISCREPANCIES.
3. GEOMETRY SHOWN IS ASSUMED BASED ON EXISTING AND COORDINATION WITH GRIT ARM MANUFACTURER. ACTUAL GEOMETRY MAY VARY PER ARM MANUFACTURERS DESIGN.
4. PROVIDE ISOLATION BETWEEN DISSIMILAR METAL USING ISOLATING SLEEVES AND WASHERS AS SPECIFIED IN SECTION 46_23_55.

KEY NOTES:

1. NEW TRUSS ARM PER SPECIFICATION 46_27_55. REPLACEMENT RAKE ARM SHALL HAVE SAME WEIGHT AND EXERT SAME TORQUE FORCE ON THE EXISTING MOTOR AS THE EXISTING RAKE ARM. CONFIRM THAT NEW ARM WILL BE COMPATIBLE WITH EXISTING MOTOR.
2. FIELD VERIFY CONNECTIONS TO EXISTING CAGE PRIOR TO FABRICATION OF NEW TRUSS ARM. CONNECTION POINTS WILL BE ACCESSIBLE DURING APRIL 2025 SHUT DOWN WINDOW. COORDINATE SCHEDULE WITH OWNER.
3. COAT EXISTING CAGE PER SPECIFICATION SECTION 09_96_01
4. NSF 61 CERTIFIED UHMW SCRAPER TO MATCH EXISTING. PROVIDE 100 LF ADDITIONAL FOR FUTURE REPLACEMENT
5. PROVIDE 1/2" CAP BETWEEN BASIN FLOOR AND SCRAPER



D PLAN
SCALE: NO SCALE
FILE: 203094_00SM101



E SECTION
SCALE: NO SCALE
FILE: 203094_00SM101

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED: MES
DRAWN: KRJ
CHECKED: MED
DATE: JANUARY 2025

No. 5568 — REGISTERED PROFESSIONAL ENGINEER — STRUCTURAL — STATE OF CALIFORNIA

carollo

City of SACRAMENTO

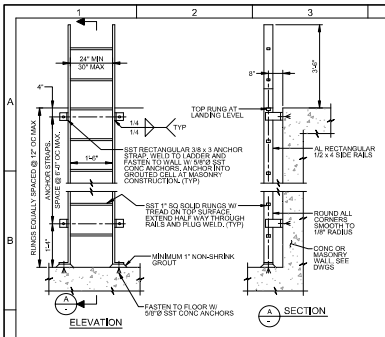
SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
STRUCTURAL/MECHANICAL
RAKE ARM PLAN & SECTIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00SM02
SHEET NO. 9 OF 10

LAST SAVED BY: KJackson

PROJECT NO. 203094-100000 FILE NAME: 203094_00SM02.dwg

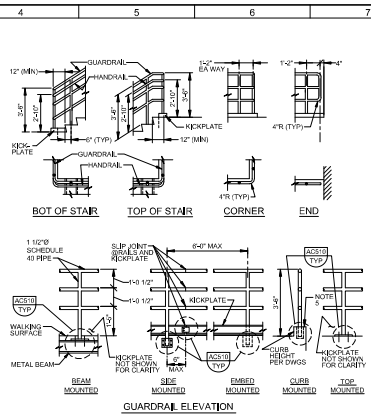


NOTES:

1. INSTALL FALL PREVENTION SYSTEM PER SPEC WHERE HEIGHT OF LADDER EXCEEDS 24'-0".
2. MINIMUM CLEARANCE TO ANY OBSTRUCTION ADJACENT TO LADDER: 2'-0" ON CLIMBING SIDE (2'-3" AT SMOOTH WALL), 1'-3" EACH SIDE OF CENTER LINE ON EACH SIDE OF LADDER.
3. WHERE GUARDRAIL IS SST, BOLT PIPE TO RAIL W/ 2 - 1/2"Ø SST BOLTS.

AC300 TYP R — LADDER - STAINLESS STEEL - WALL

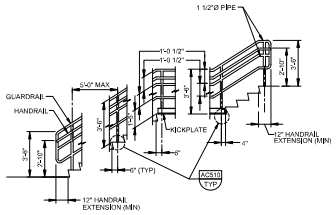
12/19/24



AC504 TYP R — GUARDRAIL - THREE RAIL

SHEET 1 OF 2

12/19/24



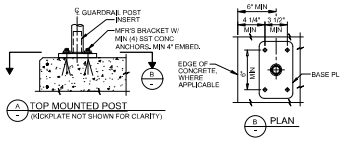
NOTES:

1. THIS DETAIL IS APPLICABLE AT PRIVATE STAIRS IN F, H, AND S OCCUPANCIES WHERE OPERATOR ONLY ACCESS IS REQUIRED. DETAILS AND INSTALLATION SHALL COMPLY WITH THE BUILDING CODE.
2. VARIOUS POST MOUNTING DETAILS ARE ILLUSTRATED. SEE DRAWINGS AND DETAIL AC510TYP FOR SPECIFIC MOUNTING REQUIREMENTS.
3. COAT SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED. PROVIDE NEOPRENE GASKET BETWEEN ALUMINUM AND STEEL.

AC504 TYP R — GUARDRAIL - THREE RAIL

SHEET 2 OF 2

12/19/24



AC510 TYP R — GUARDRAIL - MOUNTING

12/19/24

REV	DATE	BY	DESCRIPTION
			ISSUED FOR BID

DESIGNED CE
DRAWN CE
CHECKED MED
DATE JANUARY 2025

SACRAMENTO DEPARTMENT OF UTILITIES
E.A. FAIRBAIRN WTP GRIT SEPARATOR RAKE ARM REPLACEMENT
STRUCTURAL
STRUCTURAL TYPICAL DETAILS

VERIFY SCALES
BARS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 203094
DRAWING NO. 00TS01
SHEET NO. 10 OF 10

LAST SAVED BY: KJackson

PROJECT NO: 203094-100000 FILE NAME: 203094_00TS01.dwg

Attachment 2

AMERICAN RIVER FILTRATION PLANT

SACRAMENTO, CALIFORNIA

WATER TREATMENT PLANT

GRIT COLLECTOR

AMERICAN RIVER FILTRATION PLANT
SACRAMENTO, CALIFORNIA
WATER TREATMENT PLANT
SPECIFICATIONS
GRIT COLLECTOR -- PIER-SUPPORTED TYPE
SPUR GEAR DRIVE - DOUBLE PINION
ITEM 34.12

Application . . . . . Grit Removal

Tank Size . . . . . 1 @ 78'-0" x 78'-0" x 6'-3-1/2" S.W.D.

Number of Units . . . . One (1)

Type . . . . . RS

Each unit shall conform to the following specifications

COLLECTOR MECHANISM

Collector Size . . . . 77'-0" diameter.

Speed . . . . . 0.116 rpm, approx.

Drive . . . . . 1 - Sterling Slo-Speed motor reducer, Class II, rating, 125 rpm output, with 1-1/2 HP, 3 phase 60 cycle, 480 volt totally enclosed, 1800 rpm motor.
1 - Roller chain drive, with 12-tooth drive and 32-tooth driven sprockets, 1-1/4" pitch steel roller chain, with 12-gauge chain guard.
1 - Shear pin coupling with hardened steel bushings and full diameter shear pins mounted on worm gear input shaft.
1 - Coupling.
2 - Single reduction worm gear reducer, 38:1 ratio, of high tensile bronze. Gear bolted to Meehanite hub, with carburized hardened and ground alloy steel worm. CC Meehanite gear case. Spur gear pinion shaft keyed to worm gear hub. One gear right-hand, and one gear left-hand.
2 - Pinions, 17-teeth, 7.5" P.D. of AISI 4340 alloy steel, heat-treated to 220-260 Brinell.
1 - Turntable type main spur gear driving unit, including internal 80" P.D. spur gear, 3-1/2" face, 2 D.P., 160 teeth, of Meehanite GC.
1 - Turntable for main gear and collector mechanism support with 85" dia. bearing race, comprising 177 large dia. (1-1/2") hardened steel bearing balls (SAE 52100 high carbon chrome alloy steel with 64 Rockwell C. hardness) running in oil bath on replaceable hardened alloy steel inserts in annular raceways in the gear and turntable base. Oil bath protected by felt seal and dust shield. Gear case of Meehanite. Complete with oil fill, drain plugs and oil level indicator pipe. Drive turntable to mount to top of steel support pier. Steel pier 3'-6" dia

Drive (Cont.)		x 3/8" wall - furnished by W.P.E. Each drive will develop a continuous torque capacity of 1,200,000 inch-pounds.
Drive Cage	1 -	Heavy duty fabricated steel drive cage, suspended from internal gear and bearing assembly. Minimum thickness of any member 1/4".
Arms	2 -	Fabricated from heavy structural steel sections, rigidly braced to transmit full torque of the heavy gear drive. Minimum thickness of any member 1/4".
Flights	1 -	Lot 1/4" x 6" steel blade flights.
Bridge	1 -	Structural steel bridge interlaced for rigidity provided with 3/16" steel checkered plate decking and railing on both sides of bridge across approximately one-half the tank diameter, terminating with 10' square platform at center of tank.
Anchorage	1 -	Lot galvanized steel foundation bolts with center pier template.
Painting:	1 -	Shop coat machinery enamel for drives. No shop painting on any structural steel such as arms, bridge, cage, flights, etc. All sand-blasting and painting to be accomplished in the field BY OTHERS.
Electric Controls . . .		By others.
Overload Alarm	1 -	Current overload alarm system consisting of following components all mounted in NEMA IV panel for surface mounting.
	1 -	Machinery Electrification Corp. MEK 2128, adjustable electronic current overload control actuated by motor current with relays to sound alarm approaching overload. Red indicating light to indicate relay tripped on panel door. 15-second time delay to shunt out load control, on start-up. Alarm cancelling relay to shut off horn. Percent load indicator to show load on motor at all times.
	1 -	Shear pin limit switch to sound alarm and stop motor at terminal load. Switch mounted at drive.
	1 -	Weatherproof alarm horn for remote mounting - by others.
		Wiring between starter and panel and between panel and horn - by others.

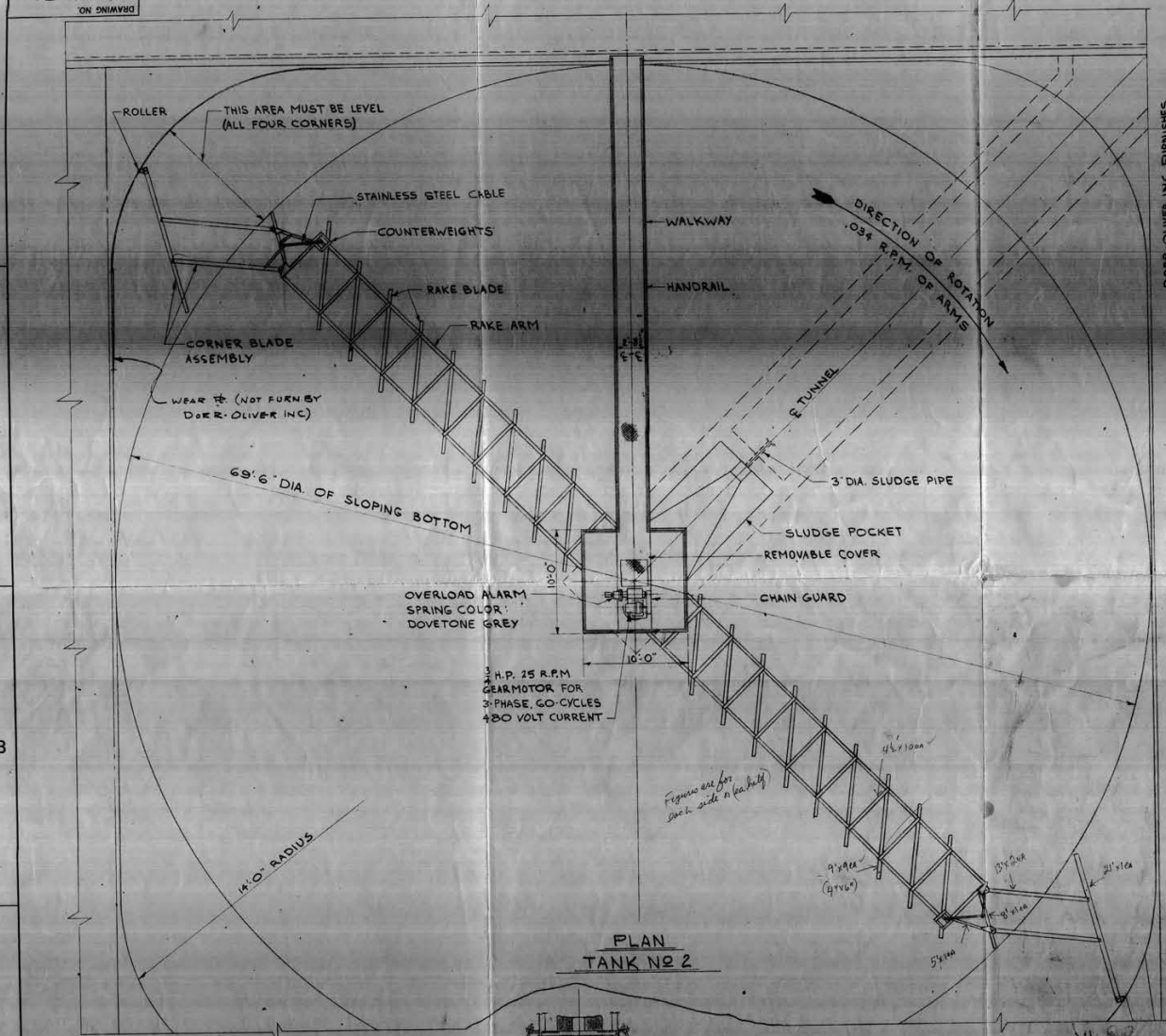
Note:
This drawing checked for agreement with plans and specifications ONLY. Fabricating dimensions and quantities of materials are the responsibility of the fabricator.

JAMES M. MONTGOMERY - - Consulting Engineers

This drawing is APPROVED subject to the Contract Requirements.

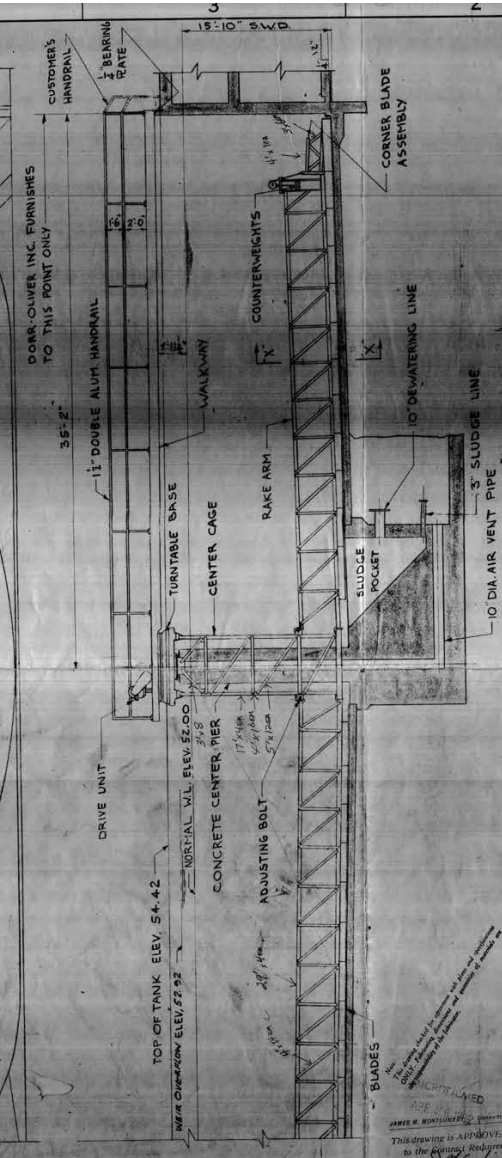
APPROVED J. Ward DATE JUN 10 1962

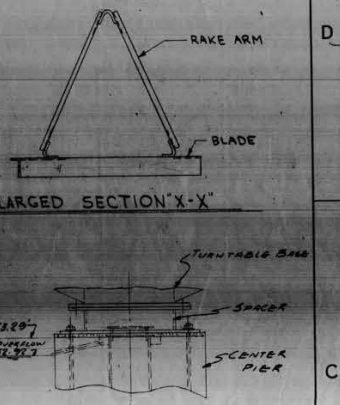
DRAWING NO. 04D10159



COLOR CODE

TANK Nº 1	WHITE
TANK Nº 2	ORANGE
TANK Nº 3	DARK BLUE
TANK Nº 4	YELLOW





NOTE:
SEE CONCRETE DWG. 04D10100 FOR DIMENSIONS NOT SHOWN ON THIS DWG.

GENERAL NOTES

THIS DRAWING COVERS OUR GENERAL RECOMMENDATIONS RELATIVE TO THE INSTALLATION OF THE DORRCO SQUAREX CLARIFIER TYPE SZ-8 AND IS FOR GENERAL INFORMATION AND ERECTION.

DORR-OLIVER INC. FURNISHES: MECHANISM TO FIT TANK OF DIMENSIONS SHOWN, INCLUDING DRIVE MECHANISM, MECHANISM INSIDE TANK, WALKWAY AND GALVANIZED ANCHOR BOLTS FOR WALKWAY AND CENTER PIER.

DORR-OLIVER INC. DOES NOT FURNISH: TANK, CONCRETE PIPING, OIL OR ANY GREASE FOR LUBRICATION, WIRING OR CONDUITS BETWEEN MOTOR CONTROLS AND ALARM, OR ANY ELECTRICAL EQUIPMENT EXCEPT AS SPECIFIED.

DORR-OLIVER INC. IS NOT RESPONSIBLE FOR THE DESIGN OR SUPPLY OF ANY CONCRETE OR REINFORCING STEEL.

THIS DRAWING REPRESENTS THE UNIT WE OFFERED IN OUR PROPOSAL. ALTERATIONS OR DELAY OF RETURN OF DRAWINGS MAY AFFECT THE PRICE AND DELAY SHIPMENT.

This drawing is APPROVED subject to the General Requirements.
APPROVED JUN 5 1962

SERIAL Nº

SYM	ZONE	REVISIONS	BY	DATE
1		Gen. REV.	R.P.B.	5-2-62
C1		ADDED DETAIL		

AWS WELDING SYMBOLS SHOWN
MACHINE FRACTIONAL DIMENSIONS ± 0.010"
MACHINE FINISHES TO A.S.A. STANDARDS

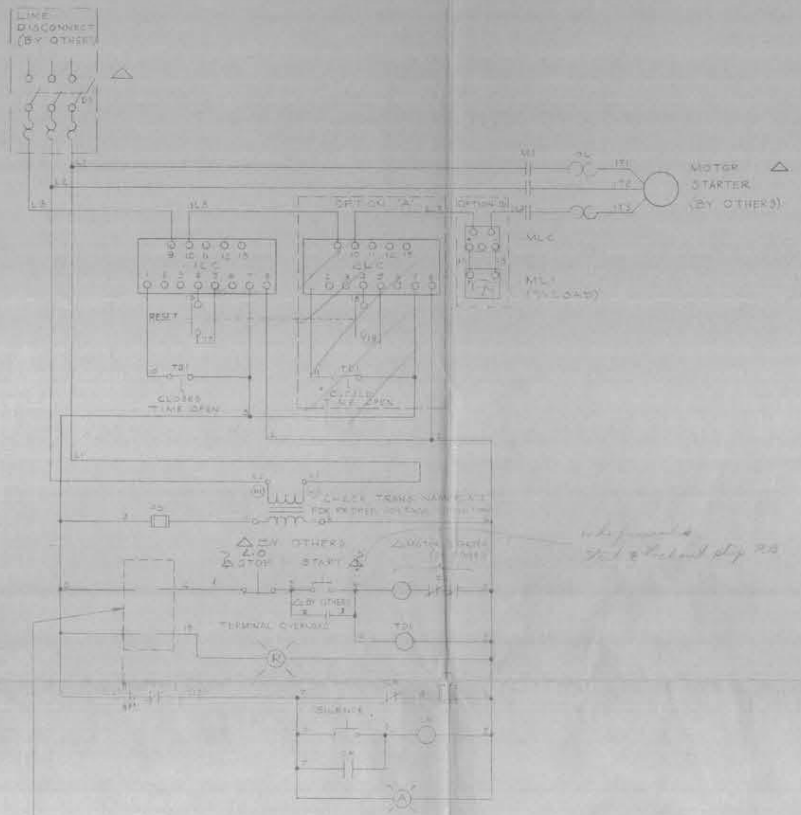
GENERAL DRAWING
DORRCO SQUAREX CLARIFIER
70'-0" DIA. x 15'-10" SWD
TYPE: SZ-8

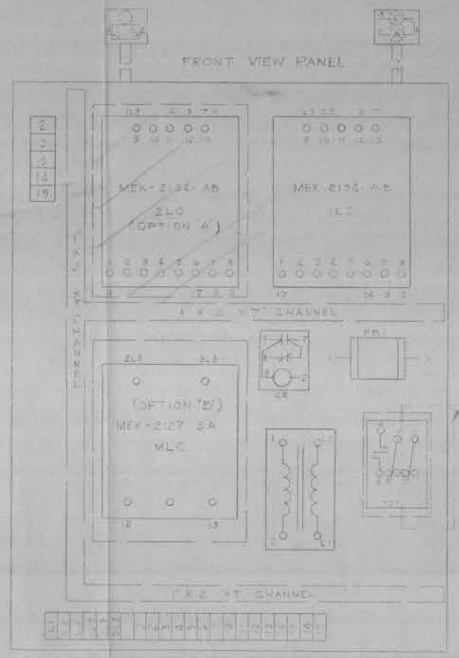
DRAWN	4-24-62	BY RAD	SCALE 1/8"
CHECKED	4-30-62	BY FLP	SIZE ORDER 47446
APPROVED		BY KSJ	MADE FROM

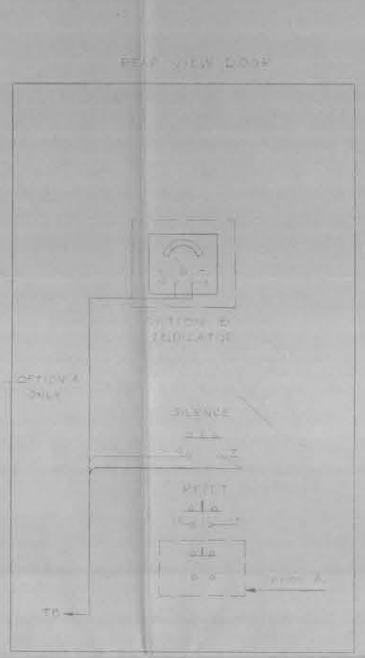
THIS PRINT IS SUBJECT TO RETURN UPON DEMAND, AND IS LOANED UPON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF

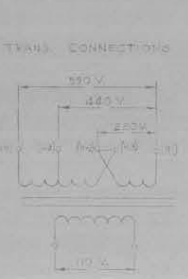
DORR-OLIVER
INCORPORATED
STAMFORD, CONNECTICUT, U.S.A.

ISSUED MAY 9 1962
ORDER 47446
DRAWING NO. 04D10159









NOTES:

1. ( ) Indicates Optional Components.
2. △ Indicates Items Furnished By Others.
3. Load Control Circuits (1LC & 2LC) Shown In The Deenergized Condition. Contacts Are As Follows:
   a. Deenergized Circuit —| |—
   b. Magnetic Relay Not Overloaded —|/|—
   c. Overload —| |—
   (Must Be Manually Reset To Restore To Condition b.)

OPTIONS:

A. Secondary Load Control Added (2LC) Contact Or Motor Are Inserted In Starter And Terminal Connected To 2LC On Terminal Strip. 2LC Set To Trip At Higher Load Than 1LC, Or Delayed On Load (1LC Trips Instantly Always, Trip Time Between 2LC Trips Determined By The Adjuster.)

B. Percent Load Meter And Switches Added To Indicate Load Condition.

LOAD CONTROL ADJUSTMENT

NULL:

1. To Prevent Disconnect Trip Mechanism, Lock On The Knob.
2. Start Motor.
3. Adjust The Null Potentiometer The Small Insulated Screw Driver Adjustment Located Just Below The Knob To Extreme Position Should Cause An Indication In The Null Of Galvanometer. (This Should Be Done To Be Certain That A Proper Null Has Been Obtained. Otherwise The Desired Setting Could Not Be Obtained) Set The Adjustment For Best Null.
4. If A Null Cannot Be Obtained Reverse The Current Leads (Wires To Terminals #7 & 10) Repeat Step 3.

LOAD:

1. Null As Above
2. Turn Load Adjustment Full Clockwise.
3. Start Motor Load Meter Should Be To Overload Point.
4. Slowly Turn Load Adjust Knob Counter Clockwise Until Load Meter Just Trips (Note 2LC Is Not Should Be Set For A Higher Trip Point Than 1LC).

OPERATION

A. When Power Is First Applied, Motor Load Control Is Prevented From Starting.
   1. Motor Will Start — Control Is Not Locked.
   2. Motor Will Start — To Make Overload (Option A)
B. Start Motor
   1. TDI Energizes And Trips TDI Contacts Short Out The Load Control So The Motor May Run On Motor Starting Current.
C. TDI
   1. TDI Times Out
   2. Load Control Resets.
D. Alarm Circuit
   1. 1LC Contacts Closed
      a) Sounds Bell And Makes Light To Signal Alarm.
      b) Silence Bell
      c) Extinguishes Light At Deenergization Only.
      Allows Operation Of Control Again When Reset Button Is Depressed.
      2LC Contacts Open
      (a) Sounds Alarm — Lights Does Not.
E. Overload
   1. 1LC Contacts Closed
      a) Sounds Alarm Bell And Lights Light
      b) Opens Control Circuit To Motor Starter Shunting Motor
      c) Closes Circuit To Red Light
      d) Energizes Solenoid
      e) Locks Reset Button In Depressed Position
      f) Opens Control Circuit To Terminal Overload Red Light
      g) Energizes Solenoid
      h) Locks Reset Button In Depressed Position
      i) Opens Control Circuit To Silence Alarm Reset Button
      j) 2LC Contacts Closed
      (a) Terminal Overload Red Light Comes Out
F. Deenergization Occurs To Both Load And Terminal Overloads.

Note:
The drawing checked for agreement with plan and specifications ONLY. Fabrication, dimensions and quantities of materials are the responsibility of the fabricator.

JAMES K. MONTGOMERY — Consulting Engineer
This drawing is APPROVED subject to the General Requirements
APPROVED J. Paul DATE JUN 10 1962

NO.	REVISIONS	DATE

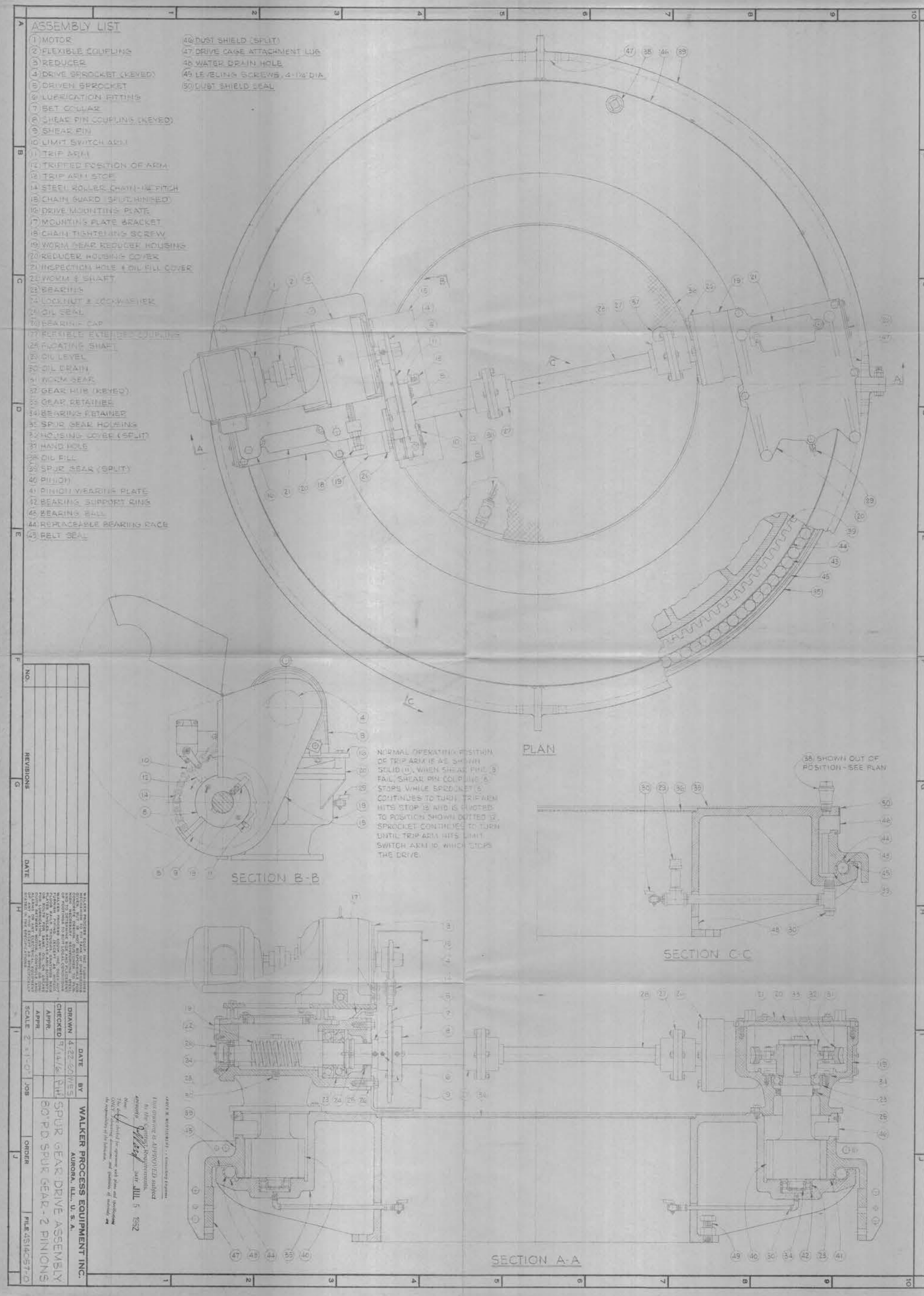
WALKER PROCESS EQUIPMENT INC. DESIGNED MECHANISM TO FIT TANK OR SUPERVISE GIVEN, BUT IS NOT RESPONSIBLE FOR SUCH. IT IS THE PURCHASER'S DUTY TO SEE NON-NECESSARY REINFORCING STEEL AND TO DETERMINE SIZE AND PLACEMENT OF FOOTINGS TO SUIT LOCAL CONDITIONS. WALKER PROCESS EQUIP. INC. DOES NOT FURNISH PIPING, EXCEPT AS NOTED. FLOOR AND TROUGHS, GRATING, UNION OR SLIDE FOR BASE, NOR DO WE STAKE FOR LUBRICATION. ANY WIRING OR CONDUITS BETWEEN MOTOR, CONTROL AND ALARMS OR ANY ELECTRICAL EQUIPMENT NOT SPECIFICALLY SHOWN ON THIS SHEET IS NOT IN THE SPECIFICATIONS.

	DATE	BY
DRAWN	5-24-62	C.E.B.
CHECKED	5-28-62	J.W.S.
APPR.		
APPR.		

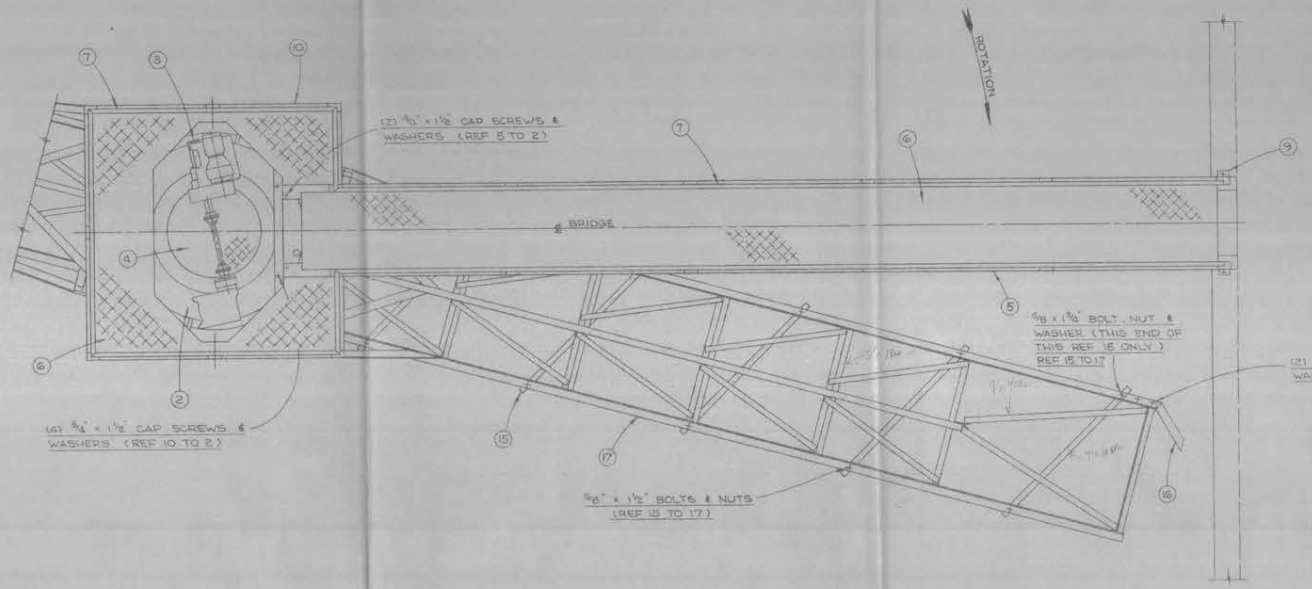
WALKER PROCESS EQUIPMENT INC.
AURORA, ILL., U. S. A.

Wiring Diagram
Electrical Control Panels

SCALE	JOB	ORDER	FILE 45157711-1

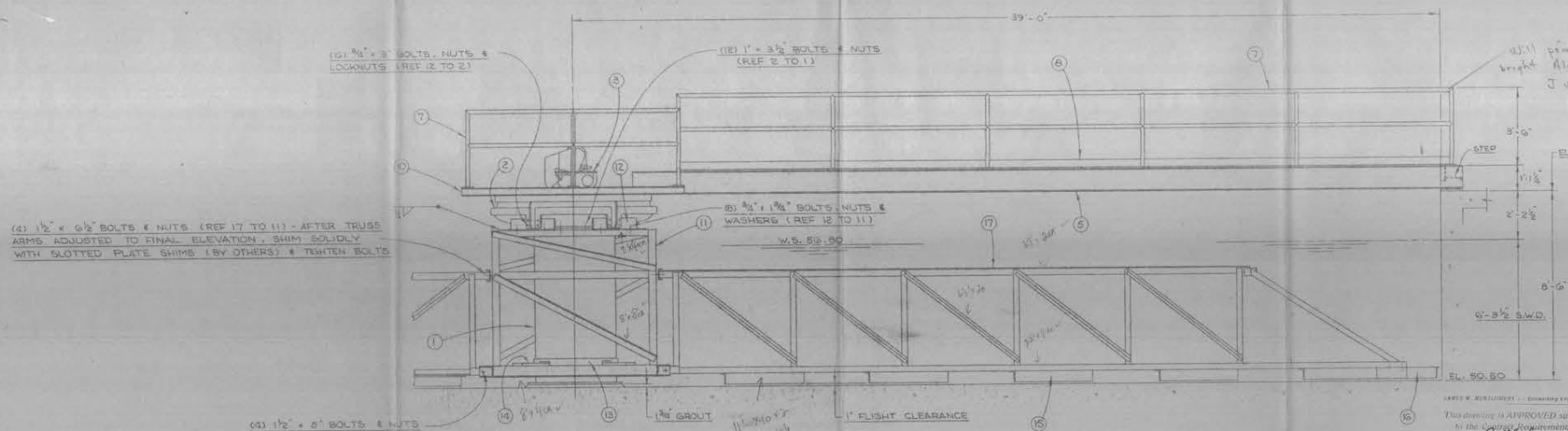

ASSEMBLY LIST
1 MOTOR
2 FLEXIBLE COUPLING
3 REDUCER
4 DRIVE SPROCKET (KEYED)
5 DRIVEN SPROCKET
6 LUBRICATION FITTING
7 SET COLLAR
8 SHEAR PIN COUPLING (KEYED)
9 SHEAR PIN
10 LIMIT SWITCH ARM
11 TRIP ARM
12 TRIPPED POSITION OF ARM
13 TRIP ARM STOP
14 STEEL ROLLER CHAIN - 1/2" PITCH
15 CHAIN GUARD (SPLIT, HINGED)
16 DRIVE MOUNTING PLATE
17 MOUNTING PLATE BRACKET
18 CHAIN TIGHTENING SCREW
19 WORM GEAR REDUCER HOUSING
20 REDUCER HOUSING COVER
21 INSPECTION HOLE & OIL FILL COVER
22 WORM & SHAFT
23 BEARING
24 LOCKNUT & LOCKWASHER
25 OIL SEAL
26 BEARING CAP
27 FLEXIBLE EXTENDED COUPLING
28 FLOATING SHAFT
29 OIL LEVEL
30 OIL DRAIN
31 WORM GEAR
32 GEAR HUB (KEYED)
33 GEAR RETAINER
34 BEARING RETAINER
35 SPUR GEAR HOUSING
36 HOUSING COVER (SPLIT)
37 HAND HOLE
38 OIL FILL
39 SPUR GEAR (SPLIT)
40 PINION
41 PINION WEARING PLATE
42 BEARING SUPPORT RING
43 BEARING BALL
44 REPLACEABLE BEARING RACE
45 FELT SEAL
46 DUST SHIELD (SPLIT)
47 DRIVE CAGE ATTACHMENT LUG
48 WATER DRAIN HOLE
49 LEVELING SCREWS, 4-1 1/4" DIA.
50 DUST SHIELD SEAL
PLAN
NORMAL OPERATING POSITION OF TRIP ARM IS AS SHOWN SOLID (11). WHEN SHEAR PIN (9) FAIL, SHEAR PIN COUPLING (8) STOPS WHILE SPROCKET (5) CONTINUES TO TURN. TRIP ARM HITS STOP (13) AND IS PIVOTED TO POSITION SHOWN DOTTED (12). SPROCKET CONTINUES TO TURN UNTIL TRIP ARM HITS LIMIT SWITCH ARM (10), WHICH STOPS THE DRIVE.
SECTION B-B
(38) SHOWN OUT OF POSITION - SEE PLAN
SECTION C-C
SECTION A-A
This drawing is APPROVED subject to the Contract Requirements.
DATE JUL 5 1962
NO. | REVISIONS | DATE
DRAWN 4-22-60 WES
CHECKED 9/14/61 PH
APPR.
APPR.
SCALE 2" = 1'-0"
JOB
ORDER
WALKER PROCESS EQUIPMENT INC.
AURORA, ILL., U. S. A.
SPUR GEAR DRIVE ASSEMBLY
60" P.D. SPUR GEAR - 2 PINIONS
FILE 4S14C57-D

ASSEMBLY LIST	
1	CENTER PIER - 3'-6" O.D. (3/8" PLATE)
2	80° SPUR GEAR DRIVE
3	DRIVE UNIT - SEE 4514057
4	REMOVABLE COVER
5	BRIDGE - 12" WF 27 #
6	RAISED PATTERN WALKWAY - 3/16" PL
7	HANDRAIL - 1½" STL. PIPE
8	TOE PLATE
9	BRIDGE SLIDE PLATES - SEE 157779
10	DRIVE PLATFORM - 10'-0" SQ.
11	DRIVE CAGE
12	DRIVE CAGE HANGERS
13	WEARING RING
14	WEARING SHOE & HOLDER - SEE 1511839
15	FLIGHT - ½" x 6"
16	ACCUMULATOR BLADE - ¼" x 6"
17	TRUSS ARM



PARTIAL PLAN

SEE 3517217 FOR FOUNDATION LAYOUT



SECTIONAL ELEVATION

JAMES W. BURTCHAELL — Consulting Engineer

This drawing is APPROVED subject to the Contract Requirements.

APPROVED: J. Burtchaell DATE: JUL 5 1962

Note: This drawing checked for agreement with plans and specifications ONLY. Fabricating dimensions and quantities of materials are the responsibility of the fabricator.

NO.	REVISIONS	DATE

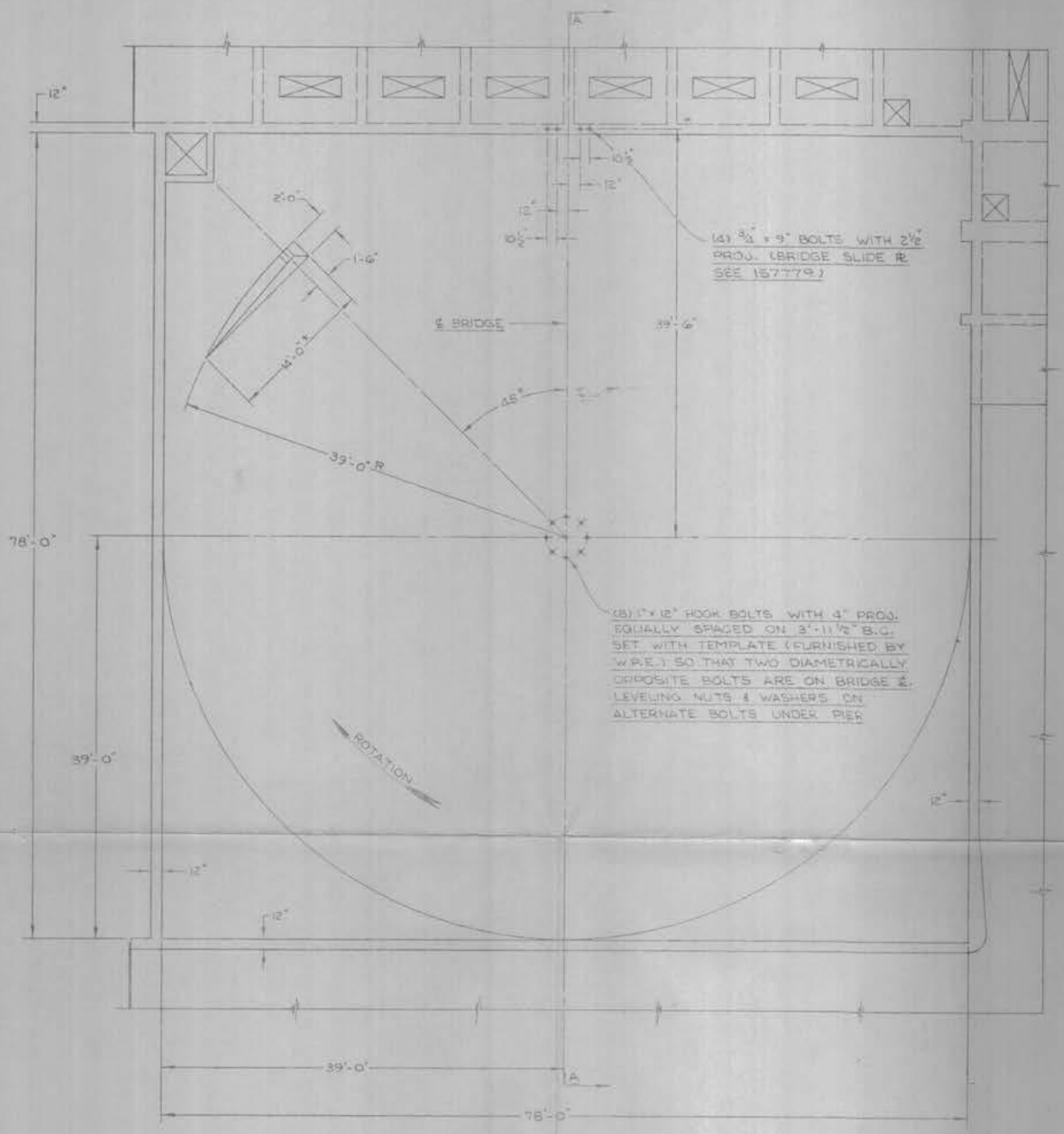
WALKER PROCESS EQUIP. INC. FURNISHES MECHANISM TO FIT TANK OR STRUCTURE GIVEN, BUT IS NOT RESPONSIBLE FOR CONCRETE DESIGN, CONSTRUCTION, NOR THICKNESS. CUSTOMER SHALL DETERMINE SIZE AND PLACEMENT OF FOOTINGS TO SUIT LOCAL CONDITIONS. WALKER PROCESS EQUIP. INC. DOES NOT FURNISH PIPING, (EXCEPT AS NOTED) FLOOR RAILS, TROUGHS, GRATINGS, WITH PLATES, ANGLES, BAFFLES AND SUPPORTS FOR SAME, UNLESS SPECIFICALLY ORDERED FOR FABRICATION AND WITHIN OUR CON-TROL BEYOND MOTOR, TORQUE AND ALARMS OR ANY ELECTRICAL EQUIPMENT OF ANY KIND EXCEPT AS NOTED OR SPECIFICALLY STATED IN THE SPECIFICATIONS.

	DATE	BY
DRAWN	5-25-62	JWS
CHECKED		
APPR.		
APPR.		

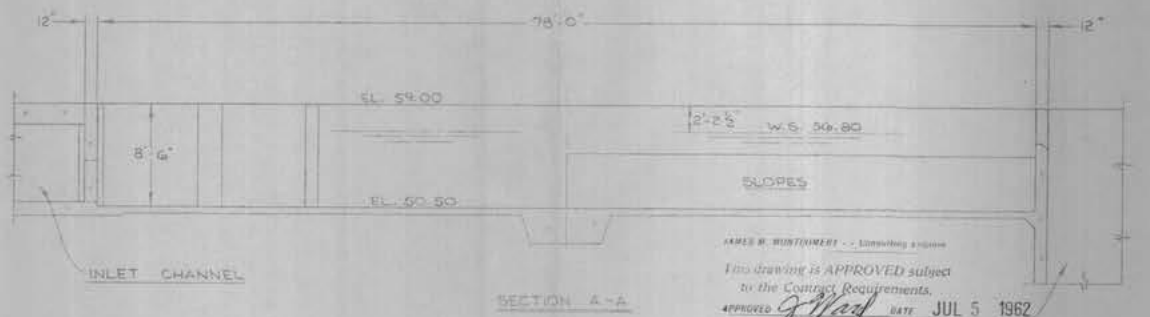
WALKER PROCESS EQUIPMENT INC.
AURORA, ILL., U. S. A.

ASSEMBLY
GRIT COLLECTOR TYPE-RS
SACRAMENTO, CALIFORNIA

SCALE 3/8" = 1'-0" | JOB 2146 | ORDER 8423 | FILE 4517218-0



PLAN @ ELEV. 59.00



SECTION A-A

JAMES W. MONTGOMERY - - Consulting engineer

This drawing is APPROVED subject to the Contract Requirements.

APPROVED J. Ward DATE JUL 5 1962

Note:
This drawing checked for agreement with plans and specifications ONLY. Fabricating dimensions and quantities of materials are the responsibilities of the fabricator.

WALKER PROCESS EQUIPMENT INC.
AURORA, ILL., U. S. A.

FOUNDATION LAYOUT
GRIT COLLECTOR TYPE-RS
SACRAMENTO, CALIFORNIA

	DATE	BY
DRAWN	5-26-62	
CHECKED		
APPR.		
APPR.		

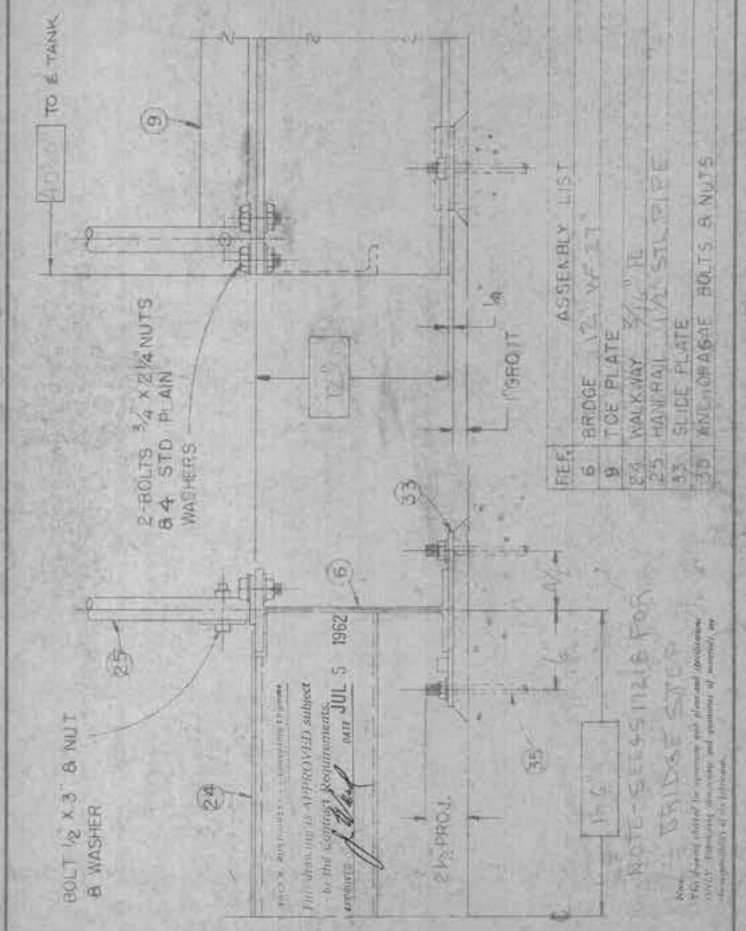
SCALE 1/8" = 1'-0" | JOB 2106 | ORDER 8423 | FILE 3S17217-0

NO.	REVISIONS	DATE

WALKER PROCESS EQUIP. INC. FURNISHES MECHANISM TO FIT TANK AS SHOWN ON THIS DRAWING BUT IS NOT RESPONSIBLE FOR CONCRETE DESIGN, CONTAINING AS MUCH REINFORCING STEEL AND TO DETERMINE SIZE AND TYPE OF FOOTINGS TO SUIT LOCAL CONDITIONS.

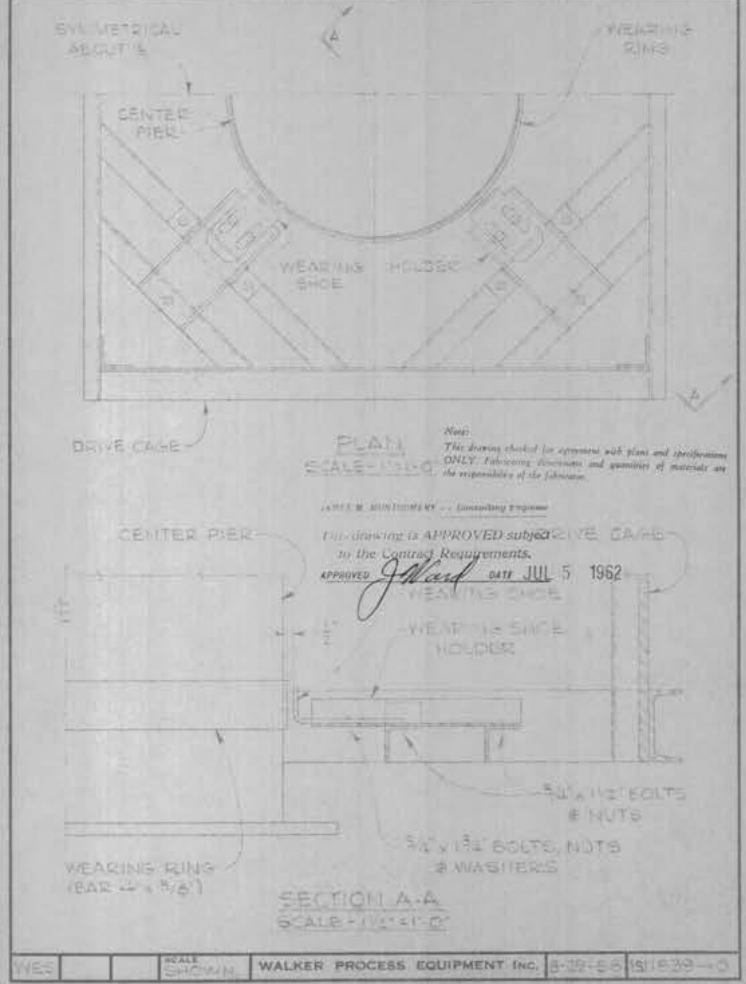
WALKER PROCESS EQUIP. INC. DOES NOT FURNISH HANDRAIL, LADDERS, ACCESS FLOOR RAILS, TROUGHS, GRATINGS, WEIR PLATES, ANGLES, BAFFLES AND SUPPORTS OR BOLTS FOR SAME, OR GREASE FOR LUBRICATION, AND WORK ON THE SITE BETWEEN MOTOR CONTROL AND ALARM OR ANY ELECTRICAL EQUIPMENT OF ANY KIND EXCEPT AS SPECIFICALLY STATED IN THE SPECIFICATIONS.

BRIDGE SLIDE PLATE ASSEMBLY



ACS | DRAWN | SCALE | WALKER PROCESS EQUIPMENT INC. | 8-4-55 | 1577794

DRIVE CASE SLIDE SHOE ASSEMBLY



WES | DRAWN | SCALE | WALKER PROCESS EQUIPMENT INC. | 8-29-55 | 1516390

Attachment 3

CITY OF SACRAMENTO, CALIFORNIA
DIVISION OF WATER AND SEWERS

SPECIFICATIONS

for

Construction of

AMERICAN RIVER FILTRATION PLANT

PART 3

DRAWINGS

Area 3. Grit Basin, Influent Meter
Area 4. Warehouse, Oil House, Alum and Carbon Storage
Area 5. Sedimentation Basins

1961

JAMES M. MONTGOMERY
CONSULTING ENGINEERS, INC.
535 EAST WALNUT STREET
PASADENA, CALIFORNIA

SACCI/61.01R

CITY OF SACRAMENTO, CALIFORNIA

DIVISION OF WATER AND SEWERS

AMERICAN RIVER WATER FILTRATION PLANT

1961

JAMES M. MONTGOMERY
Consulting Engineers, Inc.
535 E. WALNUT ST.
PASADENA, CALIFORNIA

LIST OF CONTRACT DRAWINGS

MISCELLANEOUS DRAWINGS

X1	TITLE SHEET	
X2	CONTRACT DRAWING LIST	SHEET 1
X3	CONTRACT DRAWING LIST	SHEET 2
X4	CONTRACT DRAWING LIST	SHEET 3

AREA 1 – PLANT GENERAL

1G-1	LOCATION AND VICINITY MAP
1G-2	PLOT PLAN
1G-3	HYDRAULIC GRADIENT PROFILE
1G-4	PROCESS FLOW DIAGRAM
1G-5	PLANT AND INSTRUMENT AIR FLOW DIAGRAMS
1G-6	ALUM AND ACTIVATED CARBON – FLOW DIAGRAMS
1G-7	WASH, UTILITY AND FIRE WATER FLOW DIAGRAMS
1G-8	CHLORINATION SYSTEM FLOW DIAGRAM
1G-9	INTAKE PUMPING STATION, GRIT BASIN AND HEADHOUSE GENERAL LAYOUT PLAN
1G-10	SEDIMENTATION BASIN GENERAL LAYOUT PLAN
1G-11	SEDIMENTATION BASIN GENERAL LAYOUT LONGITUDINAL SECTIONS
1G-12	SEDIMENTATION BASIN GENERAL LAYOUT TRANSVERSE SECTIONS
1G-13	FILTERS AND LIME STORAGE GENERAL LAYOUT PLAN
1G-14	FILTERS AND LIME STORAGE GENERAL LAYOUT SECTIONS
1G-15	HIGH SERVICE PUMP HOUSE AND RESERVOIR GENERAL LAYOUT PLAN
1G-16	HIGH SERVICE PUMP HOUSE AND RESERVOIR GENERAL LAYOUT SECTIONS
1G-17	BORING LOCATION PLAN
1G-18	BORING PROFILES
1A-1	DOOR SCHEDULE
1A-2	DOOR DETAILS
1A-3	WINDOW SCHEDULE AND DETAILS
1A-4	MISCELLANEOUS ARCHITECTURAL DETAILS
1C-1	GENERAL LAYOUT AND TOPOGRAPHY
1C-2	GRADING AND PAVING PLAN NORTH SECTION
1C-3	GRADING AND PAVING PLAN MIDDLE SECTION
1C-4	GRADING AND PAVING PLAN SOUTH SECTION
1C-5	PLANT ROADS SECTIONS AND DETAILS
1C-6	PLANT ROADS AND FENCE SECTIONS AND DETAILS
1C-7	PLANT ROAD SECTIONS @ LEVEE
1C-8	FIRE-WATER PIPELINE AND HYDRANT PLAN
1C-9	SANITARY AND SUMP DRAINS AREA 4 PLAN
1C-10	SANITARY AND SUMP DRAINS AREA 6 AND 7 PLAN
1C-11	SANITARY DRAINS SEPTIC TANKS AND MANHOLE DETAILS
1C-12	UNDER DRAINS GENERAL PLAN
1C-13	UNDER DRAINS PLAN UNDER SEDIMENTATION AND FILTER BASINS
1C-14	UNDER DRAINS SECTIONS AND DETAILS
1C-15	SURFACE DRAINS PROFILES AND DETAILS
1C-16	SURFACE DRAINS PLAN
1C-17	WASTE WASH WATER PIPELINE PROFILE
1C-18	EFFLUENT PIPELINES PLAN DETAILS
1C-19	INFLUENT AND EFFLUENT PIPELINES PROFILES SHEET 1
1C-20	EFFLUENT AND RECIRCULATING PIPELINE PROFILES SHEET 2
1M-1	MECHANICAL DETAILS SHEET 1 PIPING
1M-2	MECHANICAL DETAILS SHEET 2 PIPING
1M-3	MECHANICAL DETAILS SHEET 3 PIPING
1M-4	MECHANICAL EQUIPMENT SCHEDULE SHEET 1
1M-5	MECHANICAL EQUIPMENT SCHEDULE SHEET 2
1E-1	ELECTRICAL GENERAL NOTES AND LEGEND
1E-2	ELECTRICAL DISTRIBUTION SYSTEM PLOT PLAN
1E-2A	ELECTRICAL DISTRIBUTION STREET LIGHTING
1E-2B	ELECTRICAL DISTRIBUTION COMMUNICATION
1E-3	ELECTRICAL GENERAL GROUNDING PLAN
1E-4	ELECTRICAL MANHOLE AND HANDHOLE DETAILS
1E-5	ELECTRICAL DRAWING GRAPHIC INDEX

AREA 1, CONTINUED

1E-6	ELECTRICAL LIGHTING FIXTURE PICTORIAL INDEX
1E-7	ELECTRICAL SINGLE LINE DIAGRAM-480 VOLTS
1E-8	ELECTRICAL SINGLE LINE DIAGRAM-POWER CENTER SOUTH
1E-9	ELECTRICAL SINGLE LINE DIAGRAM-POWER CENTER NORTH
1E-10	ELECTRICAL MOTOR CONTROL CENTERS SHEET 1
1E-11	ELECTRICAL BLOCK DIAGRAM TELEMETERING SYSTEM
1E-12	ELECTRICAL SCHEMATIC TELEMETERING SYSTEM
1E-13	CONTROL BOARD HEADHOUSE
1E-14	ELECTRIC ANNUNCIATOR PANEL SCHEMATIC HEADHOUSE CONTROL BOARD
1E-15	CONTROL BOARDS AND ANNUNCIATOR PANEL SCHEMATIC FILTER BUILDING
1E-16	ELECTRICAL LIGHTING PANEL SCHEDULES SHEET 1
1E-17	ELECTRICAL LIGHTING PANEL SCHEDULES SHEET 2
1E-18	ELECTRICAL CONTROL SCHEMATIC HIGH SERVICE AND INTAKE PUMPS
1E-19	ELECTRICAL CONTROL SCHEMATIC CHEMICAL FEEDERS, FLOCCULATORS, CLARIFIERS AND SLUDGE PUMPS
1E-20	ELECTRICAL RELAY PANEL AND CONTROL CONSOLE FILTER BUILDING
1E-21	ELECTRICAL CONTROL SCHEMATIC FILTER BACK WASH CYCLE VALVE CONTROL
1E-22	ELECTRICAL CONTROL SCHEMATIC LIME FEEDING SYSTEM
1E-23	ELECTRICAL CONDUIT AND WIRE SCHEDULE SHEET 1
1E-24	ELECTRICAL CONDUIT AND WIRE SCHEDULE SHEET 2
1E-25	ELECTRICAL CONDUIT, WIRE, CABLE AND PULL BOX SCHEDULE SHEET 3
1E-26	ELECTRICAL BLOCK DIAGRAM TERMINAL BOARDS
1E-27	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 1
1E-28	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 2
1E-29	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 3
1E-30	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 4
1E-31	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 5
1E-32	ELECTRICAL CONNECTION DIAGRAM TERMINAL BOARD SHEET 6
1E-33	ELECTRICAL REMOTE TELEMETERING PANELS, TRANSMITTERS AND MISCELLANEOUS EQUIPMENT
1E-34	ELECTRICAL MOTOR CONTROL CENTERS SHEET 2
1E-35	ELECTRICAL UNIT POWER CENTERS
1I-1	GENERAL CONTROL DIAGRAM

AREA 2 – INTAKE PUMPING STATION, BRIDGE

2A-1	INTAKE PUMPING STATION ARCHITECTURAL FLOOR AND ROOF PLANS
2A-2	INTAKE PUMPING STATION EAST AND SOUTH ARCHITECTURAL ELEVATIONS
2A-3	INTAKE PUMPING STATION NORTH AND WEST ARCHETECTURAL ELEVATIONS
2A-4	INTAKE PUMPING STATION ARCHETECTURAL SECTIONS AND DETAILS
2A-5	INTAKE PUMPING STATION ARCHITECTURAL WALL AND EAVE DETAILS
2A-6	INTAKE PUMPING STATION MISCELLANEOUS ARCHITECTURAL DETAILS
2A-7	INTAKE PUMPING STATION WINDOW, DOOR AND PARTITION DETAILS
2M-1	INTAKE PUMPING STATION ASSEMBLY PUMPS AND PIPING PLANS
2M-2	INTAKE PUMPING STATION ASSEMBLY PUMPS AND PIPING ELEVATIONS
2M-3	INTAKE PUMPING STATION ASSEMBLY INLET SCREENS AND STOP GATE
2M-4	INTAKE PUMPING STATION INLET SCREEN DETAILS
2M-5	INTAKE PUMPING STATION TRASH RACK DETAILS
2M-6	INTAKE PUMPING STATION LIFTING YOKE ASSEMBLY AND DETAILS
2M-7	INTAKE PUMPING STATION STOP GATE ASSEMBLY AND DETAILS

AREA 2, CONTINUED

2S-1	INTAKE PUMPING STATION FLOOR PLANS @ ELEV. 61.83 AND 41.5
2S-2	INTAKE PUMPING STATION FLOOR AND FOUNDATION PLANS @ ELEV. 57.5 AND 3.6
2S-3	INTAKE PUMPING STATION TRANSVERSE SECTIONS
2S-4	INTAKE PUMPING STATION LONGITUDINAL SECTIONS
2S-5	INTAKE PUMPING STATION DETAILS BEAMS 1 AND 2
2S-6	INTAKE PUMPING STATION DETAILS BEAMS 3 AND 4
2S-7	INTAKE PUMPING STATION DETAILS BEAMS 5 AND 6
2S-8	INTAKE PUMPING STATION DETAILS BEAMS 7, 8, 9, 10 AND 11
2S-9	INTAKE PUMPING STATION SLAB AND WALL DETAILS
2S-10	INTAKE PUMPING STATION FLOOR PLATE FRAMING
2S-11	INTAKE PUMPING STATION WALLS AND SCREEN OPENINGS REINFORCING DETAILS
2S-12	INTAKE PUMPING STATION WALL REINFORCING DETAILS
2S-13	INTAKE PUMPING STATION STEEL FRAMING PLAN AND ELEVATIONS
2S-14	INTAKE PUMPING STATION STEEL FRAMING DETAILS SHEET 1
2S-15	INTAKE PUMPING STATION STEEL FRAMING DETAILS SHEET 2
2S-16	THRU 2S-19 NOT USED
2S-20	INTAKE BRIDGE PLAN, ELEVATIONS AND DETAILS
2S-21	INTAKE BRIDGE CONDUIT AND PIER DETAILS
2S-22	INTAKE BRIDGE SLAB AND WEB REINFORCING DETAILS LONGITUDINAL SECTION
2S-23	INTAKE BRIDGE TRANSITION AND SHORE PORTIONS PLANS AND TRANSVERSE SECTIONS
2S-24	INTAKE BRIDGE SHORE PORTION AND PIER REINFORCING DETAILS
2E-1	INTAKE PUMPING STATION LIGHTING AND LOW VOLTAGE PLAN
2E-2	INTAKE PUMPING STATION POWER PLAN
2E-3	INTAKE BRIDGE LIGHTING AND COMMUNICATION PLAN
2E-4	INTAKE BRIDGE ELECTRICAL MANHOLES AND CONDUIT DETAILS
2E-5	INTAKE PUMPING STATION 5 KV SWITCHGEAR PLAN AND DETAILS

AREA 3 – GRIT BASIN, INFLUENT METER

3M-1	GRIT BASIN MECHANICAL ASSEMBLY
3M-2	GRIT BASIN EFFLUENT BOX PIPING AND SLUICE GATES
3M-3	GRIT BASIN SAND PUMPS AND PIPING
3M-4	INFLUENT METER MECHANICAL ASSEMBLY
3S-1	GRIT BASIN PLAN @ ELEVATION 56.00 AND SECTIONS
3S-2	GRIT BASIN STRUCTURAL ASSEMBLY PLAN AND SECTIONS
3S-3	GRIT BASIN ELEVATIONS AND SECTIONS
3S-4	GRIT BASIN VERTICAL SECTIONS @ OUTLET BOX
3S-5	GRIT BASIN HORIZONTAL SECTIONS @ OUTLET BOX
3S-6	GRIT BASIN MISC. SECTIONS INLET AND OUTLET CHANNELS
3S-7	GRIT BASIN CRANSVERSE SECTIONS OF OUTLET BOX
3S-8	GRIT BASIN STRUCTURAL DETAILS @ OUTLET CHANNEL
3S-9	GRIT BASIN PLAN AND SECTIONS OF PUMP ROOM
3S-10	GRIT BASIN PUMP ROOM-STRUCTURAL DETAILS
3S-11	GRIT BASIN STAIRWAY AND SLAB SECTIONS
3S-12	GRIT BASIN INLET CHANNEL SECTIONS AND DETAILS
3S-13	GRIT BASIN BRIDGE CONNECTION DETAILS
3S-14	GRIT BASIN BEAM SCHEDULE AND SECTIONS
3S-15	GRIT BASIN BULKHEAD AND STOP GATE IN OUTLET CHANNEL
3S-16	GRIT BASIN BULKHEAD IN INLET CHANNEL AND HATCH COVERS
3S-17	INFLUENT PIPE LINES METER STRUCTURE NO. 1 PLAN AND DETAILS
3S-18	INFLUENT PIPE LINES METER STRUCTURE NO. 1 SECTIONS AND DETAILS

KEY TO LIST OF CONTRACT DRAWINGS

AREA 1. PLANT GENERAL

1G – GENERAL (VICINITY MAP, PLOT PLAN, FLOW DIAGRAMS, CONTROL DIAGRAMS)
1A – ARCHITECTURAL (STANDARD DETAILS)
1C – CIVIL (GRADING, DRAINAGE, PAVING, UNDERGROUND PIPE LINES AND METERS)
1M – MECHANICAL (STANDARD DETAILS)
1E – ELECTRICAL (SINGLE LINE DIAGRAMS, POWER LINES, YARD LIGHTING)
1I – INSTRUMENTATION

AREA 2. INTAKE PUMPING STATION, BRIDGE

2A – ARCHITECTURAL (PUMP HOUSE)
2M – MECHANICAL (PUMPS, PIPING, CRANE, SPACE HEATING)
2S – STRUCTURAL (INTAKE STRUCTURE, BRIDGE)
2E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUIT)

AREA 3. GRIT BASIN, INFLUENT METER

3M – MECHANICAL (CLARIFIER EQUIPMENT, SAND PUMPS AND PIPING)
3S – STRUCTURAL (GRIT BASIN)
3E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUITS)

AREA 4. HEADHOUSE, WAREHOUSE, OIL HOUSE, ALUM AND CARBON STORAGE

4A – ARCHETECTURAL (HEADHOUSE, OIL HOUSE, WAREHOUSE)
4M – MECHANICAL (AIR CONDITIONING, CHEMICAL FEEDING, ELEVATOR, PIPING, CHLORINE HANDLING, HOISTS, VENT FANS, FLASH MIXERS, PUMPS, PIPING, ALUM TANKS)
4S – STRUCTURAL (HEADHOUSE AND INFLUENT CHANNEL, ALUM TANK STRUCTURE, CARBON TANK)
4E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUITS)

AREA 5. SEDIMENTATION BASINS

5M – MECHANICAL (FLOCCULATOR AND CLARIFIER EQUIPMENT, PUMPING, PIPING)
5S – STRUCTURAL (SED. BASIN)
5E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUITS)

AREA 6. FILTERS, LIME STORAGE, WASH WATER TANK

6A – ARCHITECTURAL (FILTER, LIME FEEDER AND LIME UNLOADING BLDG.,)
6M – MECHANICAL (PUMPS, PIPING, FEEDERS, CONVEYORS, BINS, WASH WATER TANK, SPACE HEATERS)
6S – STRUCTURAL (FILTER BASINS, BLDGS., EFFLUENT CONDUIT, STORAGE BIN STRUCTURE, CONVEYOR TUNNEL UNLOADING HOPPER)
6E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUITS)

AREA 7. HIGH SERVICE PUMPING STATION, TRANSFORMER STATION, RESERVOIR

7A – ARCHITECTURAL (PUMP HOUSE)
7M – MECHANICAL (PUMPS, PIPING, CRANE, SPACE HEATING)
7S – STRUCTURAL (PUMP HOUSE, RESERVOIR)
7E – ELECTRICAL (POWER, CONTROL AND LIGHTING CIRCUITS)

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

LIST OF CONTRACT DRAWINGS

SHEET 1

DESIGNED BY: [illegible] R.C.E. 5500 DATE 8-21-61

DRAWN BY: RK

CHECKED BY: [illegible]

SCALE:

JAMES M. MONTGOMERY
CONSULTING ENGINEER
330 E. WALNUT ST. PASADENA, CALIF. NO. 1-5918 ST. 3-7128

SHEET X-2 OF SHEETS

APPROVED BY: [illegible] CITY ENGINEER R.C.E. 5762 DATE 8-28-61

AREA 3. CONTINUED

3E-1 GRIT BASIN
POWER AND LIGHTING PLAN
CONDUIT DETAILS
3E-2 INFLUENT METER STRUCTURE
POWER AND LIGHTING PLAN

AREA 4 - HEADHOUSE, WAREHOUSE, OIL HOUSE, ALUM, AND CARBON STORAGE

4A-1 HEADHOUSE
FIRST FLOOR PLAN AND PARTIAL PLOT PLAN
4A-2 HEADHOUSE
2ND, 3RD FLOORS AND PARTIAL ROOF PLANS
4A-3 HEADHOUSE
3RD FLOOR ROOF PLAN AND SERVICE STAIRWAY DETAILS
4A-4 HEADHOUSE
WEST AND NORTH ELEVATIONS
4A-5 HEADHOUSE
EAST AND SOUTH ELEVATIONS AND HANDRAIL DETAILS
4A-6 HEADHOUSE
NORTH-SOUTH SECTIONS
4A-7 HEADHOUSE
EAST-WEST SECTIONS
4A-8 HEADHOUSE
FRONT ENTRANCE DETAILS
4A-9 HEADHOUSE
MISC, EXTERIOR DETAILS
4A-10 HEADHOUSE
ROOF AND FLASHING DETAILS
4A-11 HEADHOUSE
ROOF AND FLASHING DETAILS AND INTERIOR ROOM FINISH SCHEDULE
4A-12 HEADHOUSE
LOBBY PLAN, ELEVATIONS AND DETAILS
4A-13 HEADHOUSE
INTERIOR ELEVATIONS
4A-14 HEADHOUSE
INTERIOR TOILETS AND LOCKER ROOMS
4A-15 HEADHOUSE
LABORATORY FURNITURE AND EQUIPMENT LAYOUT
4A-16 HEADHOUSE
LABORATORY INTERIOR ELEVATIONS SHEET 1
4A-17 HEADHOUSE
LABORATORY INTERIOR ELEVATIONS SHEET 2
4A-18 HEADHOUSE
LABORATORY INTERIOR ELEVATIONS SHEET 3
4A-19 HEADHOUSE
INTERIOR ELEVATIONS, BASE AND STORE FRONT DETAILS
4A-20 HEADHOUSE
MISC, INTERIOR DETAILS
4A-21 HEADHOUSE
CONTROL ROOM AND KITCHEN DETAILS
4A-22 HEADHOUSE
MISC, DETAILS

4M-1 HEADHOUSE AIR CONDITIONING
1ST FLOOR PLAN AND SCHEDULES
4M-2 HEADHOUSE AIR CONDITIONING
2ND AND 3RD FLOOR PLANS
4M-3 HEADHOUSE AIR CONDITIONING
ROOF PLAN AND SECTIONS
4M-4 HEADHOUSE AIR CONDITIONING
CONTROL DIAGRAM
4M-5 HEADHOUSE
DRAINS AND VENTS 1ST AND 2ND FLOORS
4M-6 HEADHOUSE
DRAINS AND VENTS 3RD FLOOR, BASEMENT AND ROOF
4M-7 HEADHOUSE
UTILITY PIPING 1ST AND 2ND FLOORS
4M-8 HEADHOUSE
UTILITY PIPING SECTIONS AND DETAILS
4M-9 HEADHOUSE
UTILITY AND DRAIN PIPING SECTIONS AND DETAILS
4M-10 HEADHOUSE
PLUMBING RISER DIAGRAM
4M-11 NOT USED
4M-12 HEADHOUSE
MACHINE SHOP EQUIPMENT LAYOUT
4M-13 HEADHOUSE
CHLORINE CYLINDER HANDLING AND PIPING
4M-14 HEADHOUSE
CHLORINATOR PIPING
4M-15 HEADHOUSE
ALUM FEEDERS PIPING AND FLASH MIXERS
4M-16 HEADHOUSE
AIR COMPRESSOR PIPING
4M-17 HEADHOUSE
VACUUM PUMP AND DEMINERALIZER PIPING
4M-18 HEADHOUSE
LOWER PIPE GALLERY AND YARD PIPING TRENCH
4M-19 ALUM STORAGE
TANKS, PUMPS AND PIPING ASSEMBLY
4M-20 ALUM STORAGE TANKS
FABRICATION DETAILS
4M-21 ACTIVATED CARBON STORAGE
TANKS, PUMPS AND PIPING ASSEMBLY

AREA 4. CONTINUED

4S-1 HEADHOUSE
BASEMENT FOUNDATION PLANS AND DETAILS
4S-2 HEADHOUSE
FIRST FLOOR FRAMING PLAN AND DETAILS
4S-3 HEADHOUSE
SECOND AND THIRD FLOOR FRAMING PLANS
4S-4 HEADHOUSE
ROOF FRAMING PLAN AND SLAB SCHEDULES
4S-5 HEADHOUSE
NORTH AND WEST ELEVATIONS
4S-6 HEADHOUSE
SOUTH AND EAST ELEVATIONS
4S-7 HEADHOUSE
INTERIOR WALL ELEVATIONS SHEET 1
4S-8 HEADHOUSE
INTERIOR WALL ELEVATIONS SHEET 2
4S-9 HEADHOUSE
FRONT ENTRANCE MARQUEE DETAILS
4S-10 HEADHOUSE
WALL SECTIONS
4S-11 HEADHOUSE
STAIR DETAILS SHEET 1
4S-12 HEADHOUSE
STAIR DETAILS SHEET 2
4S-13 HEADHOUSE
INFLUENT CONDUIT SECTIONS
4S-14 HEADHOUSE
INFLUENT CONDUIT TRANSITION SECTIONS
4S-15 HEADHOUSE
BEAM DETAILS SHEET 1
4S-16 HEADHOUSE
BEAM DETAILS SHEET 2
4S-17 HEADHOUSE
BEAM DETAILS SHEET 3
4S-18 ALUM TANK SUPPORT
STRUCTURAL ASSEMBLY AND DETAILS
4S-19 ACTIVATED CARBON PUMP HOUSE
STRUCTURAL ASSEMBLY AND DETAILS
4S-20 ACTIVATED CARBON TANK
STRUCTURAL ASSEMBLY AND DETAILS
4S-21 WAREHOUSE
STRUCTURAL ASSEMBLY AND DETAILS
4S-22 OIL STORAGE BUILDING
STRUCTURAL ASSEMBLY AND DETAILS
4S-23 PIPE AND ELECTRICAL CONDUIT TRENCH
HEADHOUSE TO WAREHOUSE

4E-1 HEADHOUSE LIGHTING PLAN
1ST AND 2ND FLOORS
4E-2 HEADHOUSE LIGHTING AND POWER PLAN
3RD FLOOR AND BASEMENT
4E-3 HEADHOUSE LIGHTING AND POWER PLAN
TELEMETER GUTTER DETAILS @ LABORATORY
4E-4 HEADHOUSE POWER AND TELEPHONE PLAN
1ST AND 2ND FLOORS
4E-5 HEADHOUSE CABLE TRAY AND CONDUIT DETAILS
PIPE TUNNEL
4E-6 ALUM AND CARBON STORAGE, OIL HOUSE AND WAREHOUSE
POWER AND LIGHTING PLAN
4E-7 POWER CENTER NORTH
PLAN, SECTIONS AND DETAILS

AREA 5. SEDIMENTATION BASINS

5M-1 FLOCCULATORS
MECHANICAL ASSEMBLY
5M-2 FLOCCULATORS
MECHANICAL DETAILS
5M-3 CLARIFIERS
MECHANICAL ASSEMBLY
5M-4 SEDIMENTATION BASIN
PIPEWAY PLANS
UPPER PASSAGEWAY SHEET 1
5M-5 SEDIMENTATION BASINS
PIPEWAY PLANS AND SECTIONS
UPPER PASSAGEWAY SHEET 2
5M-6 SEDIMENTATION BASINS
PIPEWAY PLANS AND SECTIONS
TOP AND LOWER PASSAGEWAY SHEET 1
5M-7 SEDIMENTATION BASINS
PIPEWAY PLAN AND SECTIONS
LOWER PASSAGEWAY SHEET 2
5M-8 SEDIMENTATION BASINS
PIPEWAY PLAN
LOWER PASSAGEWAY SHEET 3
5M-9 SEDIMENTATION BASINS
SLUDGE AND DEWATERING PUMPS
PIPING PLAN
5M-10 SEDIMENTATION BASINS
SLUDGE AND DEWATERING PUMPS
PIPING SECTIONS

AREA 5. CONTINUED

5S-1 SEDIMENTATION BASIN
GENERAL PLAN AND SECTIONS
5S-2 SEDIMENTATION BASIN
FLOOR AND FOUNDATION PLAN AND SECTIONS
5S-3 SEDIMENTATION BASIN
SECTION AND DETAILS "A"
5S-4 SEDIMENTATION BASIN
SECTION AND DETAILS "B"
5S-5 SEDIMENTATION BASIN
SECTION AND DETAILS "C"
5S-6 SEDIMENTATION BASIN
PASSAGEWAY BELOW CLARIFIER AREA
PLANS AND SECTIONS
5S-7 SEDIMENTATION BASIN
CLARIFIER AREA
PLANS AND SECTIONS
5S-8 SEDIMENTATION BASIN
JOINT LOCATION PLAN AND DETAILS
5S-9 SEDIMENTATION BASIN
SECTIONS THROUGH INFLUENT CONDUIT
5S-10 SEDIMENTATION BASIN
STAIRS AND GARDEN STORAGE ROOM
PLANS AND DETAILS
5S-11 SEDIMENTATION BASIN
NORTH-SOUTH WALL ELEVATIONS
5S-12 SEDIMENTATION BASIN
PASSAGEWAY NORTH AND SOUTH
WALL ELEVATIONS
5S-13 SEDIMENTATION BASIN
STEEL BULKHEADS AND LADDER DETAILS
5S-14 SEDIMENTATION BASIN
SLIDE GATES AND DETAILS
5S-15 SEDIMENTATION BASIN
FLOOR DRAINAGE PLANS
5S-16 SEDIMENTATION BASIN
ENLARGED TOP SLAB AND FRAMING

5E-1 SEDIMENTATION BASINS
POWER AND LIGHTING PLAN @ FLOCCULATORS
ELEV. 54.42
5E-2 SEDIMENTATION BASINS
POWER AND LIGHTING PLAN @ CLARIFIERS
ELEV. 54.42
5E-3 SEDIMENTATION BASINS
LIGHTING PLAN @ SETTLING SECTIONS
ELEV. 54.42
5E-4 SEDIMENTATION BASINS
LIGHTING PLAN @ WEIR SECTION
ELEV. 54.42
5E-5 SEDIMENTATION BASINS
LIGHTING PLAN UPPER PASSAGEWAY
5E-6 SEDIMENTATION BASINS
LIGHTING AND POWER PLAN LOWER PASSAGEWAY
5E-7 SEDIMENTATION BASINS
POWER PLAN @ SLUDGE PUMPS
5E-8 SEDIMENTATION BASINS
CABLE TRAY IN PASSAGEWAY
PLAN AND DETAILS
5E-9 SEDIMENTATION BASINS
POWER PLAN @ FLOCCULATOR DRIVES

AREA 6. FILTERS, LIME STORAGE, WASH WATER TANK

6A-1 FILTER AND LIME FEEDER BUILDING
FLOOR PLANS
6A-2 FILTER AND LIME FEEDER BUILDING
SOUTH AND NORTH ELEVATIONS
6A-3 FILTER AND LIME FEEDER BUILDING
EAST AND WEST ELEVATIONS
6A-4 FILTER AND LIME FEEDER BUILDING
ROOF PLAN AND DETAILS
6A-5 FILTER AND LIME FEEDER BUILDING
INTERIOR STAIRS
6A-6 FILTER AND LIME FEEDER BUILDING
EXTERIOR STAIRS AND FEEDER CATWALK
6A-7 FILTER AND LIME FEEDER BUILDING
WINDOW DETAILS
6A-8 FILTER AND LIME FEEDER BUILDING
TOILET AND JANITOR CLOSET MISC. DETAILS
6A-9 FILTER AND LIME FEEDER BUILDING
WINDOW AND ENCLOSURE DETAILS

6M-1 FILTERS
PIPE GALLERY PIPING
PLAN AND ELEVATION WEST HALF
6M-2 FILTERS
PIPE GALLERY PIPING
PLAN AND ELEVATION EAST HALF
6M-3 FILTERS
PIPE GALLERY PIPING
WASH WATER AND CONTROL VALVES
6M-4 FILTERS
PIPE GALLERY PIPING
SURFACE AND WASH WATER PLANS

AREA 6. CONTINUED

6M-5 FILTERS
PIPE GALLERY AND FILTER PIPING
SURFACE WASH WATER ELEVATIONS AND DETAILS
6M-6 FILTERS
SURFACE-WASH PIPING
TRANSVERSE SECTIONS
6M-7 FILTERS
SURFACE WASH PIPING
PLAN @ FILTERS NOS. 2 AND 4
6M-8 FILTERS
SURFACE WASH PIPING
PLAN @ FILTERS NOS. 6 AND 8
6M-9 FILTERS
SURFACE WASH PIPING
LONGITUDINAL SECTIONS
6M-10 FILTERS
SAND UNDER DRAINS
PLAN AND SECTIONS
6M-11 FILTERS
SAND UNDER DRAINS
DETAILS AND SECTIONS
6M-12 FILTERS
PIPE GALLERY EAST-WEST
MISC. PIPING PLAN AND ELEVATION
6M-13 FILTERS
PIPE GALLERY
MISC., PIPING SECTIONS AND SCHEMATIC
6M-14 FILTERS
WASTE WASH WATER AND CHLORINE SOLUTION PIPING
6M-15 LIME HANDLING FACILITIES
GENERAL ARRANGEMENT PLAN
6M-16 LIME HANDLING FACILITIES
GENERAL ARRANGEMENT ELEVATION AND SECTIONS
6M-17 THRU 6M-19 NOT USED
6M-20 LIME FEEDER BUILDING
CONVEYORS, FEEDERS AND PIPING PLAN
6M-21 LIME FEEDER BUILDING
CONVEYORS, FEEDERS AND PIPING ELEVATIONS
6M-22 LIME FEEDER BUILDING
MISC. PIPING SECTIONS
6M-23 UTILITY TUNNEL PIPING
PLAN AND ELEVATION
6M-24 WASH WATER TANK
PIPING PLAN
6M-25 WASH WATER TANK
PIPING ELEVATIONS AND SECTIONS
SOUTH ELEVATION
6M-26 WASH WATER TANK
PIPING ELEVATIONS AND SECTIONS
EAST ELEVATION
6M-27 WASH WATER TANK
INLET AND OUTLET PIPING
SECTIONS AND DETAILS
6M-28 WASH WATER TANK
FABRICATION DETAILS

6S-1 FILTERS
OPERATING FLOOR AND UPPER GULLET PLANS
6S-2 FILTERS
LOWER GULLET AND FOUNDATION PLANS
6S-3 FILTERS
EFFLUENT WASTE WASH WATER CONDUIT
PLANS AND SECTIONS
6S-4 FILTERS
GULLET AND TROUGH SECTIONS
6S-5 FILTERS
GULLET AND WEIRS
SECTION AND DETAILS
6S-6 FILTERS
MAIN PASSAGEWAY
SECTIONS AND DETAILS
6S-7 FILTERS
INFLUENT CONDUIT AND END PASSAGEWAY
SECTIONS AND DETAILS
6S-8 FILTERS
EFFLUENT AND WASTE WASH WATER CONDUITS
SECTIONS
6S-9 FILTERS
EFFLUENT CONDUIT AND MAIN PASSAGEWAY
SECTIONS

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

LIST OF CONTRACT DRAWINGS

SHEET 2

DESCRIPTION | DATE | BY

R.C.E. 5500 DATE 8-21-61

SCALE:

JAMES M. MONTGOMERY
CONSULTING ENGINEER
835 E. WALNUT ST. PASADENA, CALIF.
SYC. 1-3918 ST. 3-7128

SHEET X-3 OF SHEETS

DESIGNED BY
DRAWN BY
CHECKED BY

APPROVED E.O. Pawlson R.C.E. 5262 DATE 10-24-61
BY CITY ENGINEER

AREA 6, CONTINUED

65-10 FILTERS
BEAMS AND WALKWAYS
REINFORCING STEEL DETAILS
65-11 FILTERS
DRAIN VALVE
MOUNTING AND DETAILS
65-12 FILTER BUILDING
ROOF PLAN
65-13 FILTER BUILDING
ROOF SLAB AND FRAMING SECTIONS AND DETAILS
SHEET 1
65-14 FILTER BUILDING
ROOF SLAB FRAMING SECTIONS AND DETAILS
SHEET 2
65-15 FILTER BUILDING
STRUCTURAL ELEVATIONS
65-16 FILTERS
STAIR SECTIONS AND DETAILS
65-17 FILTERS
STEEL BULKHEADS, SLIDE GATES AND JOINTS
SECTIONS AND DETAILS
65-18 LIME FEEDER BUILDING GRIT HOPPER
65-19 LIME STORAGE BINS
SUBSTRUCTURE FOUNDATION PLAN
SECTIONS AND DETAILS
65-20 LIME STORAGE BINS
SUBSTRUCTURE PLAN AND ELEVATIONS
65-21 LIME RECEIVING AND POWER CENTER STRUCTURE
BASEMENT PLAN AND WALL SECTIONS
65-22 LIME RECEIVING AND POWER CENTER STRUCTURE
FLOOR PLAN
65-23 LIME RECEIVING AND POWER CENTER STRUCTURE
ROOF PLAN, ELEVATIONS AND SECTIONS
65-24 EFFLUENT CONDUIT AND UTILITY TUNNEL BETWEEN FILTERS AND PUMP STATION
PLAN AND SECTIONS
65-25 EFFLUENT CONDUIT AND UTILITY TUNNEL BETWEEN FILTERS AND PUMP STATION
SECTIONS
65-26 LIME RECEIVING AND POWER CENTER STRUCTURE
BASEMENT AND TUNNEL STAIR
PLANS AND DETAILS
65-27 LIME RECEIVING AND POWER CENTER STRUCTURE
LIME RECEIVING HOPPER
65-28 LIME STORAGE BINS WORKING PLATFORM
PLANS AND DETAILS
65-29 LIME STORAGE BINS
STAIRS AND DETAILS
65-30 LIME STORAGE BINS
FABRICATION DETAILS
65-31 LIME ELEVATOR TOWER
TOWER AND WORKING PLATFORM

6E-1 FILTER BUILDING
POWER AND CONTROL PLAN @ OPERATING FLOOR
6E-2 FILTERS
POWER AND CONTROL PLAN IN PIPE GALLERY
6E-3 FILTER BUILDING
LIGHTING PLAN @ OPERATING GALLERY
6E-4 FILTERS
LIGHTING PLAN IN PIPE GALLERY AND PASSAGEWAY
6E-5 LIME UNLOADING AND STORAGE BUILDING
LIGHTING AND POWER PLAN
6E-6 POWER CENTER SOUTH
PLANS, SECTIONS AND DETAILS
6E-7 WASH WATER TANK AREA AND METER STRUCTURES
POWER, LIGHTING AND CONT. PLAN
6E-8 WASH WATER TANK AREA AND METER STRUCTURES
ENLARGED PLANS, ELEV. AND DETAILS

AREA 7, HIGH SERVICE PUMPING STATION, TRANSFORMER STATION, RESERVOIR

7A-1 HIGH SERVICE PUMPING STATION
FLOOR PLAN AND SECTIONS
7A-2 HIGH SERVICE PUMPING STATION
ELEVATIONS
7A-3 HIGH SERVICE PUMPING STATION
INTERIOR DETAILS
7A-4 HIGH SERVICE PUMPING STATION
ROOF PLAN, ROOF AND WALL DETAILS
7A-5 HIGH SERVICE PUMPING STATION
WINDOW DETAILS

7M-1 HIGH SERVICE PUMPING STATION
PUMPS AND PIPING
GENERAL ASSEMBLY PLAN
7M-2 HIGH SERVICE PUMPING STATION
PUMPS AND PIPING
GENERAL ASSEMBLY LONGITUDINAL SECTION
7M-3 HIGH SERVICE PUMPING STATION
PUMPS AND PIPING
GENERAL ASSEMBLY TRANSVERSE SECTION
7M-4 HIGH SERVICE PUMPING STATION
EXTERIOR PIPING & METERS
7M-5 HIGH SERVICE PUMPING STATION
PUMP DISCHARGE MANIFOLD PIPING
PLAN

AREA 7, CONTINUED

7M-6 HIGH SERVICE PUMPING STATION AND RESERVOIR
SLUICE GATES
7M-7 UTILITY TUNNEL PIPING
FILTERS TO PUMPING STATION
PLAN AND ELEVATIONS
7M-8 EFFLUENT PIPE LINES
METER NO. 2 MECHANICAL ASSEMBLY
7M-9 EFFLUENT PIPE LINES
METER NO. 3 MECHANICAL ASSEMBLY

7S-1 HIGH SERVICE PUMPING STATION
FOUNDATION, INTERMEDIATE AND OPERATING FLOOR PLANS
7S-2 HIGH SERVICE PUMPING STATION
ROOF PLAN AND DETAILS
7S-3 HIGH SERVICE PUMPING STATION
ROOF SLAB DETAILS
7S-4 HIGH SERVICE PUMPING STATION
STRUCTURAL SECTIONS
7S-5 HIGH SERVICE PUMPING STATION
WALL SECTIONS AND DETAILS
7S-6 HIGH SERVICE PUMPING STATION
PLAN BELOW ELEVATION 25.50
7S-7 HIGH SERVICE PUMPING STATION
PLAN @ ELEVATION 35.75
7S-8 HIGH SERVICE PUMPING STATION
FLOOR PLAN @ ELEVATION 40.00
7S-9 HIGH SERVICE PUMPING STATION
SECTION 1-1
7S-10 HIGH SERVICE PUMPING STATION
SECTION 2-2
7S-11 HIGH SERVICE PUMPING STATION
SECTION 3-3
7S-12 HIGH SERVICE PUMPING STATION
SECTION 4-4
7S-13 HIGH SERVICE PUMPING STATION
SECTION 5-5
7S-14 HIGH SERVICE PUMPING STATION
SECTION 6-6
7S-15 HIGH SERVICE PUMPING STATION
SECTION 7-7
7S-16 HIGH SERVICE PUMPING STATION
INTERIORS STAIR DETAILS
7S-17 HIGH SERVICE PUMPING STATION
BEAM AND WATER STOP DETAILS
7S-18 HIGH SERVICE PUMPING STATION
EXTERIOR STEEL STAIRS
7S-19 HIGH SERVICE PUMPING STATION
MISC. DETAILS
7S-20 RESERVOIR
FLOOR PLAN
7S-21 RESERVOIR TYPICAL SECTION
WALL AND COLUMNS
7S-22 RESERVOIR
TYPICAL SECTION THRU EFFLUENT CONDUIT
7S-23 RESERVOIR
ROOF PLAN
7S-24 RESERVOIR
PARTIAL ROOF PLAN W/TYPICAL STRIPS AND ACCESS HATCH DETAILS
7S-25 RESERVOIR
TYPICAL ROOF STRIP REINFORCING DETAILS
7S-26 RESERVOIR
OVERFLOW DETAILS
7S-27 RESERVOIR INLET STRUCTURE
ROOF AND FOUNDATION PLAN
7S-28 RESERVOIR INLET STRUCTURE
SECTIONAL PLANS
7S-29 RESERVOIR INLET STRUCTURE
SECTION A-A
7S-30 RESERVOIR INLET STRUCTURE
SECTIONS B-B AND C-C
7S-31 RESERVOIR INLET STRUCTURE
SECTIONS D-D, E-E AND F-F
7S-32 RESERVOIR INLET STRUCTURE
ACCESS HATCH DETAILS
7S-33 RESERVOIR INLET STRUCTURE
CONSTRUCTION JOINT DETAILS AND RESERVOIR CORNER DETAILS
7S-34 RESERVOIR OUTLET STRUCTURE
FLOOR PLAN
7S-35 RESERVOIR OUTLET STRUCTURE
FOUNDATION PLAN
7S-36 RESERVOIR OUTLET STRUCTURE
SECTIONS A-A THRU G-G
7S-37 RESERVOIR OUTLET STRUCTURE
RETAINING WALL DETAILS
7S-38 RESERVOIR OUTLET STRUCTURE
CONSTRUCTION JOINT DETAILS
7S-39 RESERVOIR OUTLET STRUCTURE
SECTIONAL PLAN @ ELEV. 22.00
7S-40 RESERVOIR OUTLET STRUCTURE
SECTIONAL PLAN @ ELEV. 36.00
7S-41 RESERVOIR OUTLET STRUCTURE
SECTION A-A AND A-A
7S-42 RESERVOIR OUTLET STRUCTURE
SECTION B-B
7S-43 RESERVOIR OUTLET STRUCTURE
SECTION C-C
7S-44 RESERVOIR OUTLET STRUCTURE
SECTION D-D
7S-45 RESERVOIR OUTLET STRUCTURE
SECTION E-E
7S-46 RESERVOIR OUTLET STRUCTURE
SECTIONS F-F AND G-G

AREA 7, CONTINUED

7S-47 RESERVOIR OUTLET STRUCTURE
BEAM DETAILS "A"
7S-48 RESERVOIR OUTLET STRUCTURE
BEAM DETAILS "B"
7S-49 RESERVOIR OUTLET STRUCTURE
ACCESS HATCH DETAILS
7S-50 RESERVOIR OUTLET STRUCTURE
CONSTRUCTION JOINT DETAILS FOR FUTURE EXTENSION
7S-51 RESERVOIR
MISCELLANEOUS DETAILS
7S-52 EFFLUENT PIPELINES
METER STRUCTURE NO. 2 PLAN AND SECTION
7S-53 EFFLUENT PIPELINES
METER AND VALVE STRUCTURES NOS. 3, 4, AND 5 PLAN AND SECTION

7E-1 SUBSTATION @ HIGH SERVICE PUMPING STATION
PRIMARY FEEDERS AND DETAILS
7E-2 OUTDOOR SWITCHGEAR AND METAL ENCLOSED BUS @ HIGH SERVICE PUMPING STATION
7E-3 HIGH SERVICE PUMPING STATION
LIGHTING PLAN
7E-4 HIGH SERVICE PUMPING STATION
POWER PLAN AND CONTROL PANELS
7E-5 ENTRANCE GATE
LIGHTING AND CONTROL PLAN AND DETAILS
7E-6 RESERVOIR
UNDER DRAIN SUMP
PLAN AND DETAILS

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

LIST OF CONTRACT DRAWINGS

SHEET 3

DESCRIPTION

RCE 5500 DATE 8-21-1961

SCALE:

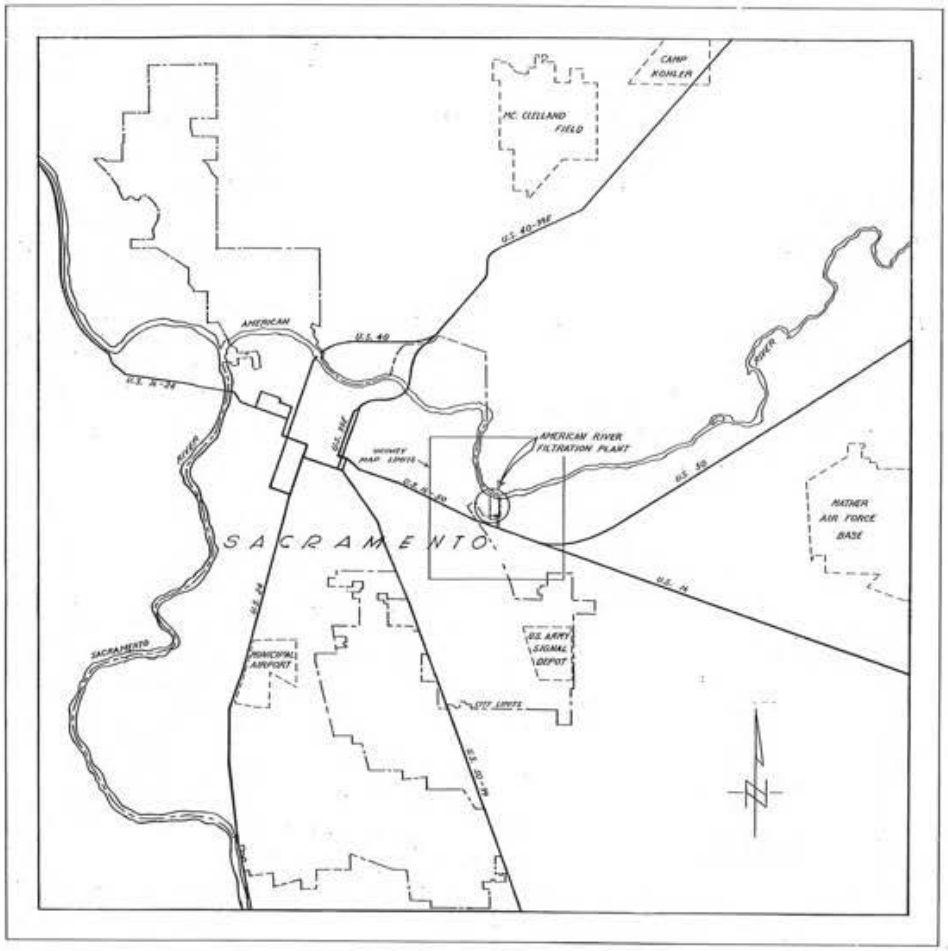
JAMES M. MONTGOMERY
CONSULTING ENGINEER
535 E. WALNUT ST. PASADENA, CALIF.
NO. 1-5818 SY. 3-7128

SHEET X-4 OF SHEETS

DESIGNED BY
DRAWN BY RR
CHECKED BY

APPROVED
CITY ENGINEER

RCE 5862 DATE 8-24-1961



LOCATION MAP

SCALE - 1" = 6000'

VICINITY MAP

SCALE - 1" = 1000'

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

LOCATION AND VICINITY MAPS

REV. | DATE | DESCRIPTION

DESIGNED BY N.B.
DRAWN BY N.B.
CHECKED BY

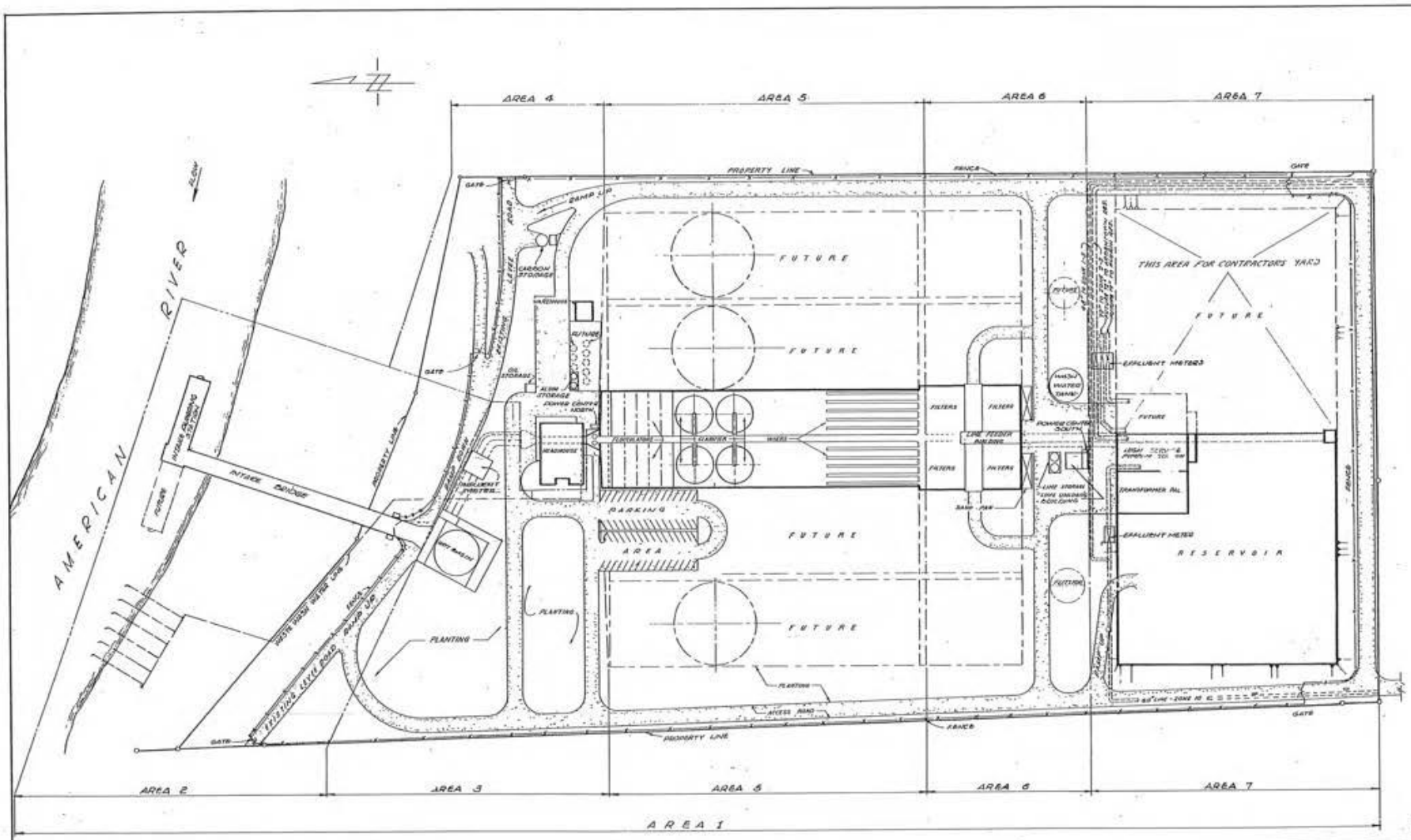
SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
930 E. WALNUT ST. PASADENA, CALIF.
NO. 1-5618 ST. 5-7108

APPROVED R.C.E. 5262 DATE 8-24 19 61

SHEET IG-1 OF SHEETS

R.C.E. 5500 DATE 8-21 19 61



THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

PLOT PLAN

R.C.E. 5800 DATE 8-21 19 61

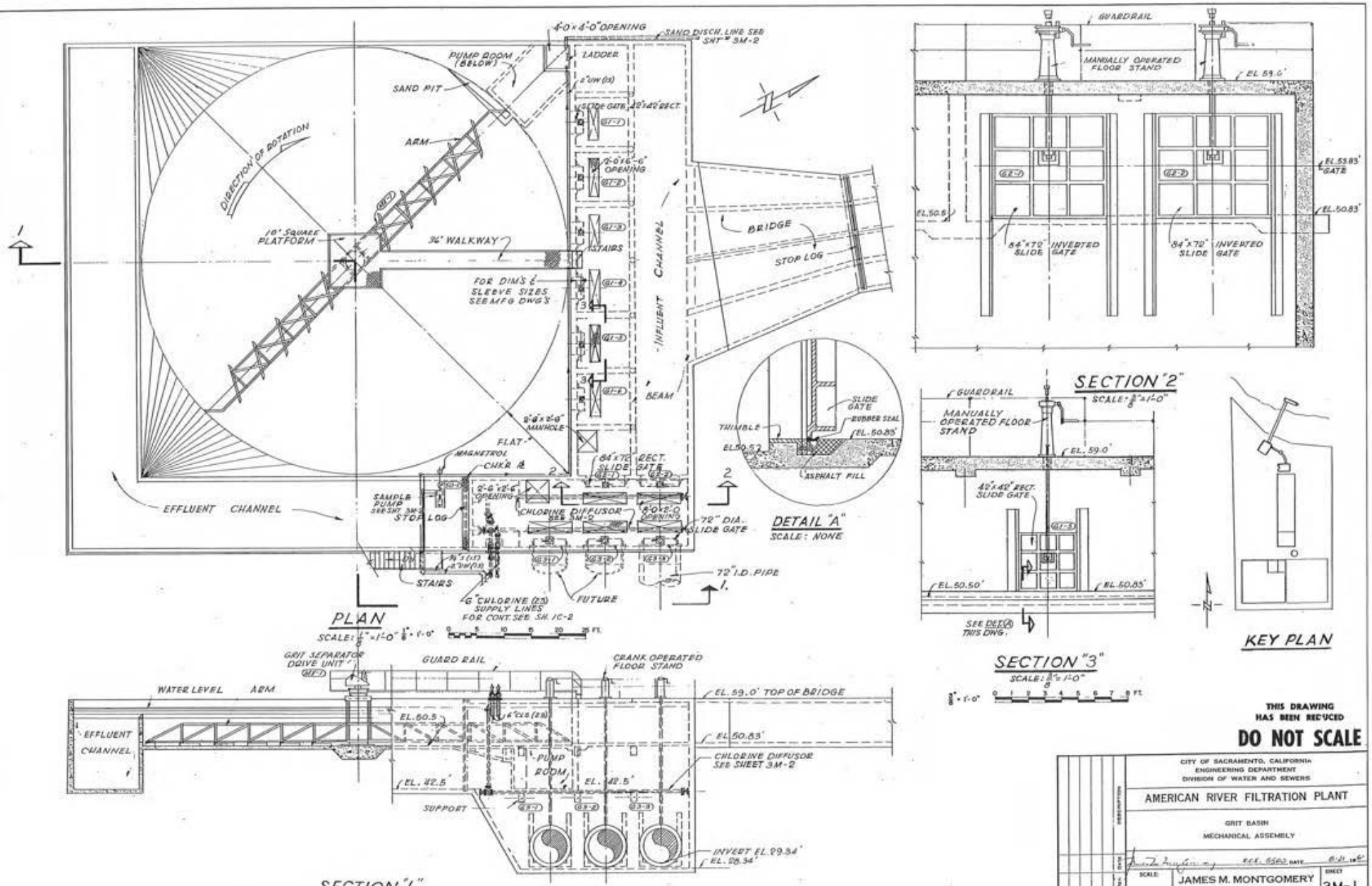
SCALE: 1" = 80'

JAMES M. MONTGOMERY
CONSULTING ENGINEER
938 E. WALNUT ST. PASADENA, CALIF.
HU. 1-5078 ST. 3-7128

SHEET IG-2 OF SHEETS

DESIGNED BY R.A.
DRAWN BY N.D. Jr.
CHECKED BY J.M.M.

APPROVED E.O. Faulkner R.C.E. 5762 DATE 8-28 19 61
BY CITY ENGINEER



THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
MECHANICAL ASSEMBLY

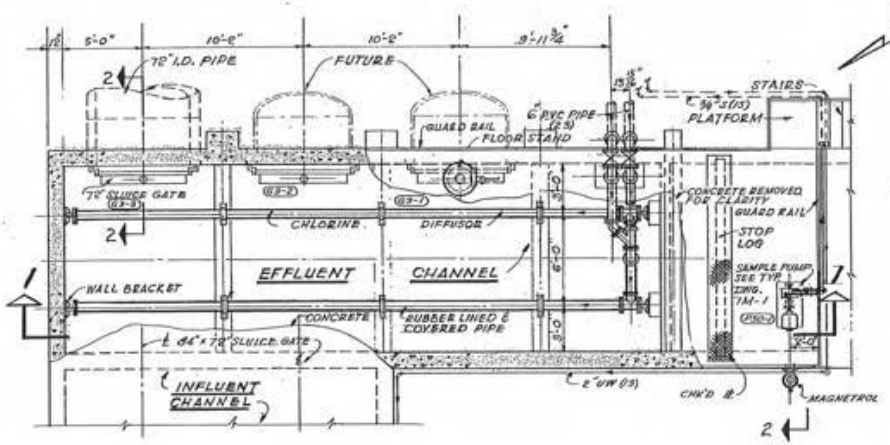
DESIGNED BY W.J.L.
CHECKED BY W.J.L.
CHECKED BY

APPROVED BY G.E. Bastian CITY ENGINEER
R.C.E. 6562 DATE 8-21-1962

SCALE: 1/8"=1'-0"

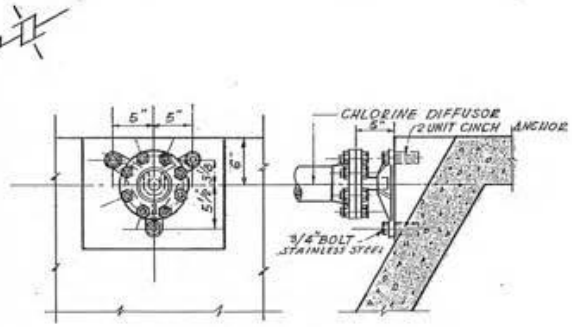
JAMES M. MONTGOMERY
CONSULTING ENGINEER
835 E. WALNUT ST. PASADENA, CALIF.
MU. 1-5510 ST. 3-7139

SHEET 3M-1 OF SHEETS



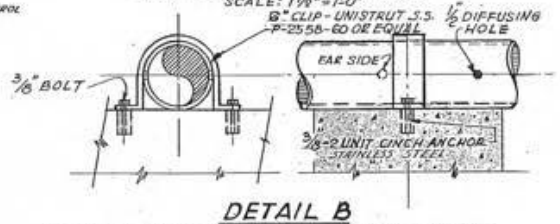
PLAN

CHLORINE DIFFUSOR PIPING AT GRIT BASIN
SCALE: ½" = 1'-0"



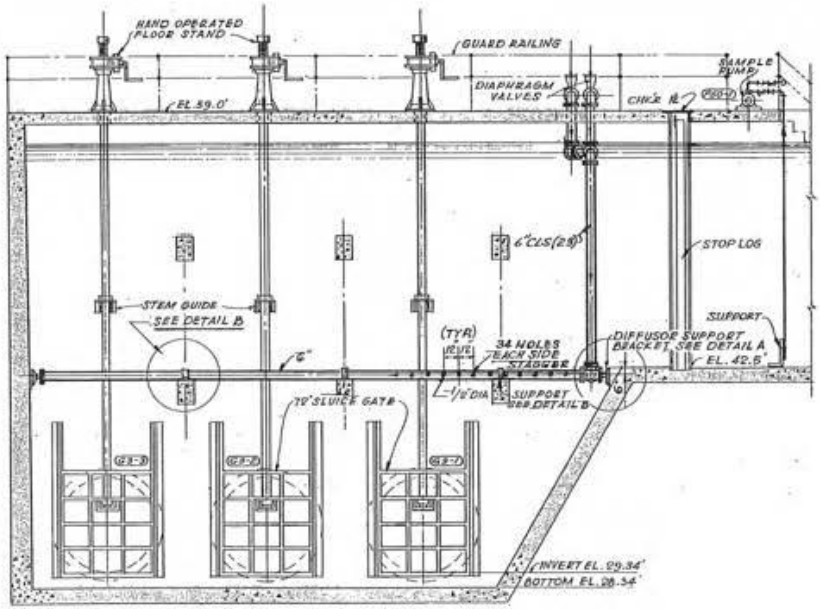
DETAIL A

DIFFUSOR BRACKET SUPPORT
SCALE: 1½" = 1'-0"



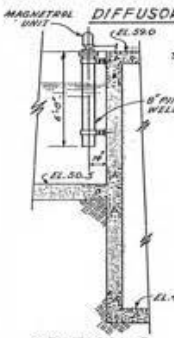
DETAIL B

DIFFUSOR PIPE INTERMEDIATE SUPPORT
SCALE: 3" = 1'-0"



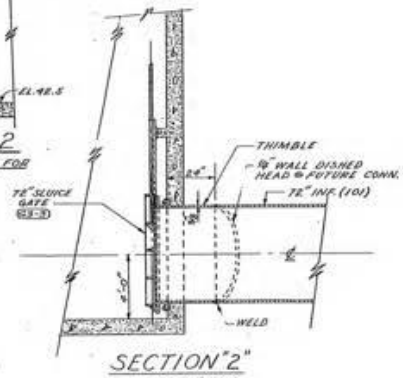
SECTION 1

SCALE ½" = 1'-0"



SECTION 2

LEVEL CONTROL FOR GRIT BASIN



SECTION "2"

SCALE ½" = 1'-0"

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

EFFLUENT BOX PIPING AND SLUICE GATES

M.E. 5500 DATE 8-21 19 61

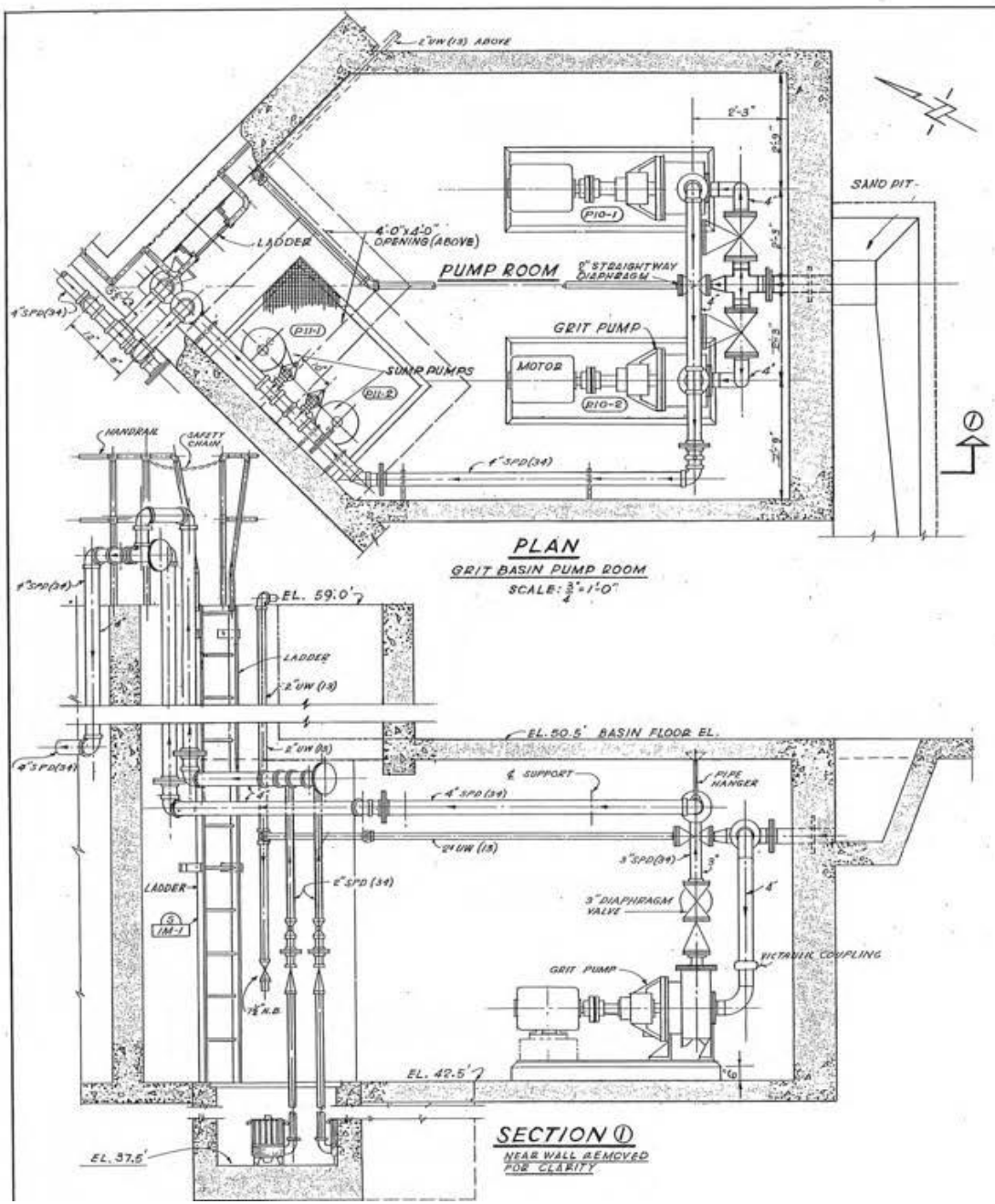
SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
535 E. WALNUT ST. PASADENA, CALIF.
SY. 1-0414 SY. 3-7159

SHEETS 3M-2 OF SHEETS

DESIGNED BY W.J.L.
DRAWN BY W.J.L.
CHECKED BY

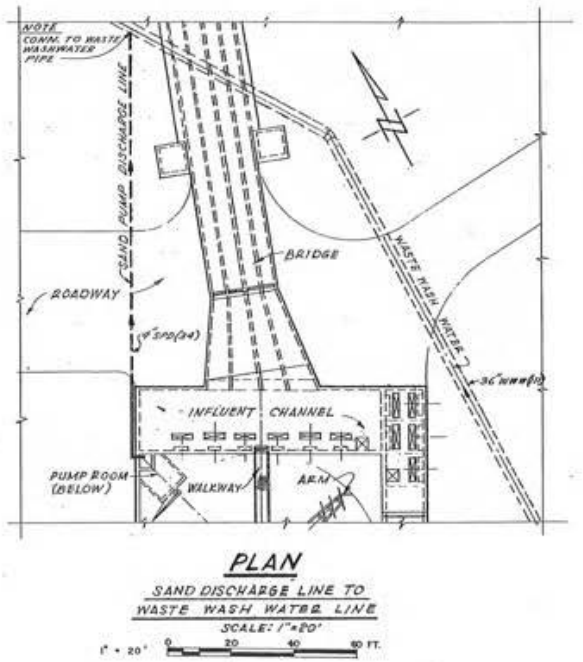
APPROVED BY CITY ENGINEER R.C.E. 4611 DATE 8-28 19 61



PLAN

GRIT BASIN PUMP ROOM

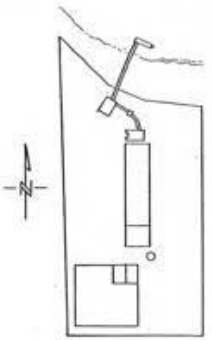
SCALE: 3/4"=1'0"



PLAN

SAND DISCHARGE LINE TO WASTE WASH WATER LINE

SCALE: 1"=20'



KEY PLAN

SECTION ①

NEAR WALL REMOVED FOR CLARITY

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
SAND PUMPS AND PIPING

SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
555 E. WALNUT ST. PASADENA, CALIF.
MU. 1-2818 ST. 3-7128

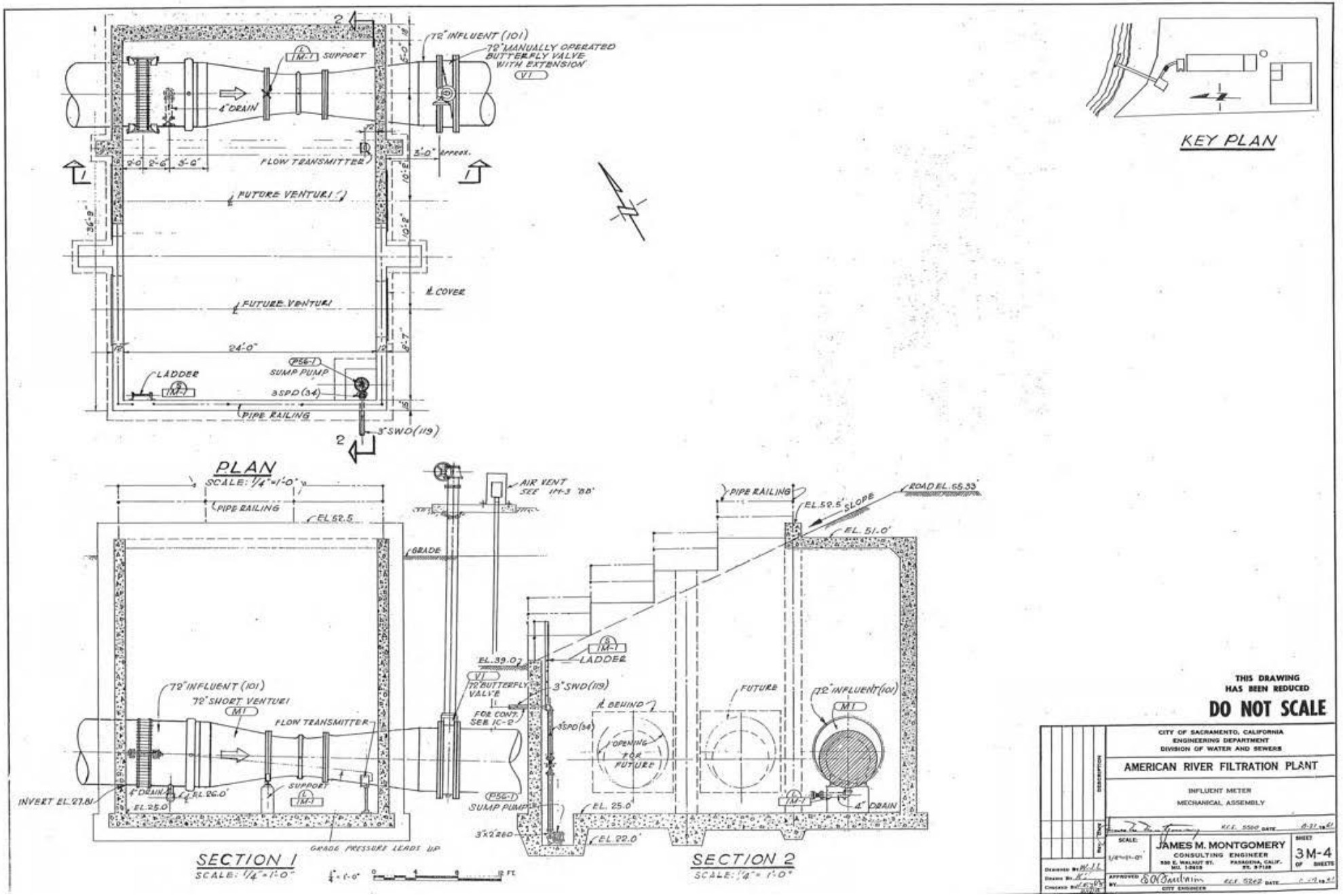
SHEET 3 M-3 OF SHEETS

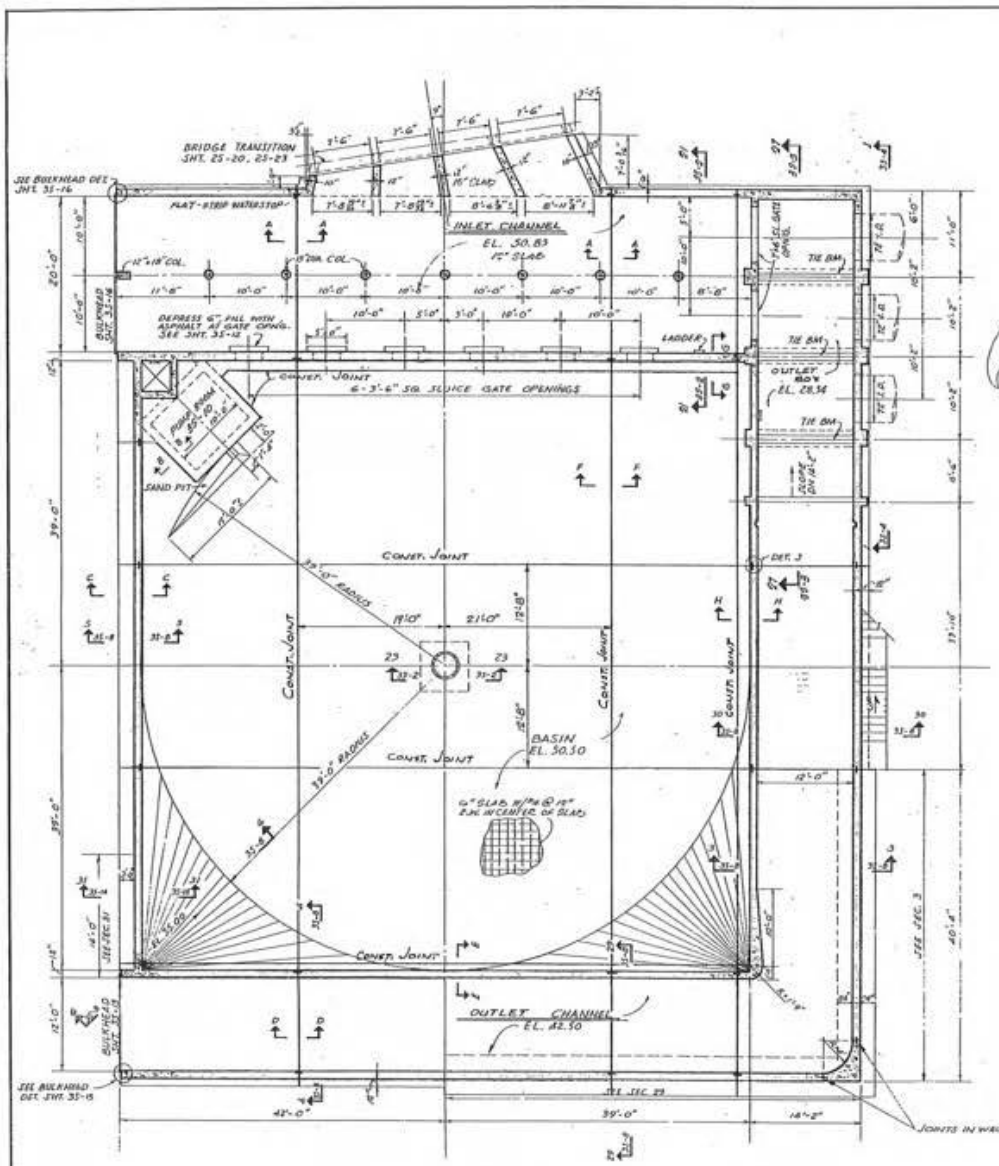
DESIGNED BY W.J.L.
DRAWN BY W.J.L.
CHECKED BY

APPROVED BY CITY ENGINEER

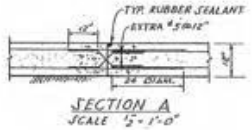
F.C.E. 5500 DATE 8-21-19 61

F.C.E. 5202 DATE 4-19 19 61

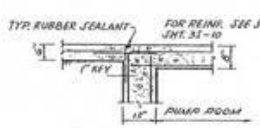

72" INFLUENT (101)
72" MANUALLY OPERATED BUTTERFLY VALVE WITH EXTENSION
VI
M-1 SUPPORT
4" DRAIN
FLOW TRANSMITTER
5'-0" APPROX.
FUTURE VENTURI
FUTURE VENTURI
℄ COVER
24'-0"
LADDER
PSG-1 SUMP PUMP
3 SPD (34)
PIPE RAILING
3" SWD (119)
PLAN
SCALE: 1/4"=1'-0"
PIPE RAILING
EL. 52.5
GRADE
AIR VENT SEE IM-3 'BB'
72" INFLUENT (101)
72" SHORT VENTURI
FLOW TRANSMITTER
4" DRAIN
EL. 26.0'
EL. 25.0
INVERT EL. 27.81
SUPPORT
GRADE PRESSURE LEADS UP
SECTION 1
SCALE: 1/4"=1'-0"
EL. 39.07
72" BUTTERFLY VALVE
FOR CONT. SEE IC-2
3" SWD (119)
3 SPD (34)
OPENING FOR FUTURE
SUMP PUMP
3"x226D
EL. 25.0'
EL. 22.0'
PIPE RAILING
EL. 52.5' SLOPE
ROAD EL. 55.33'
EL. 51.0'
LADDER
FUTURE
72" INFLUENT (101)
4" DRAIN
SECTION 2
SCALE: 1/4"=1'-0"
KEY PLAN
THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE
CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS
AMERICAN RIVER FILTRATION PLANT
INFLUENT METER
MECHANICAL ASSEMBLY
JAMES M. MONTGOMERY
CONSULTING ENGINEER
3M-4



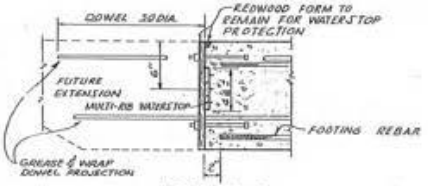
PLAN – AT EL. 56.00
SCALE 1/8" = 1'-0"



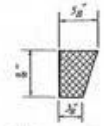
SECTION A
SCALE 1/2" = 1'-0"



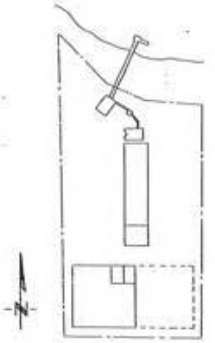
SECTION B
SCALE 1/2" = 1'-0"



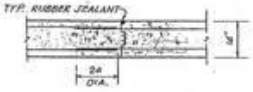
SECTION C
SCALE 1 1/2" = 1'-0"



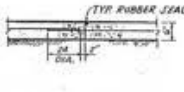
TYP. RUBBER SEALANT GROOVE
SCALE – FULL SIZE



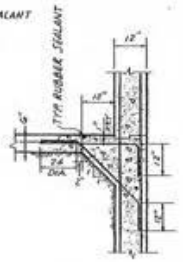
KEY PLAN



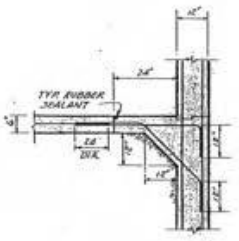
SECTION D
SCALE 1/2" = 1'-0"



SECTION E
SCALE 1/2" = 1'-0"

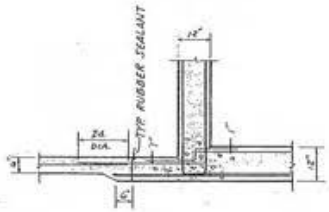


SECTION E
SCALE 1/2" = 1'-0"

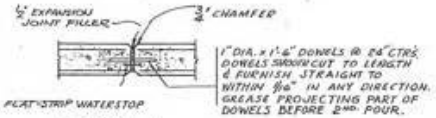


SECTION H
SCALE 1/2" = 1'-0"

1/8" = 1'-0" 0 1 2 3 4 5 6 FT.



SECTION G
SCALE 1/2" = 1'-0"



DETAIL J
SCALE 1/2" = 1'-0"

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
JAMES M. MONTGOMERY
CIVIL & MARINE
CALIF. REGISTERED ENGINEER CERTIFICATE NO. 19

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

PLAN AT EL. 56.00 AND SECTIONS

R.C.E. 5500 DATE 8-31-61

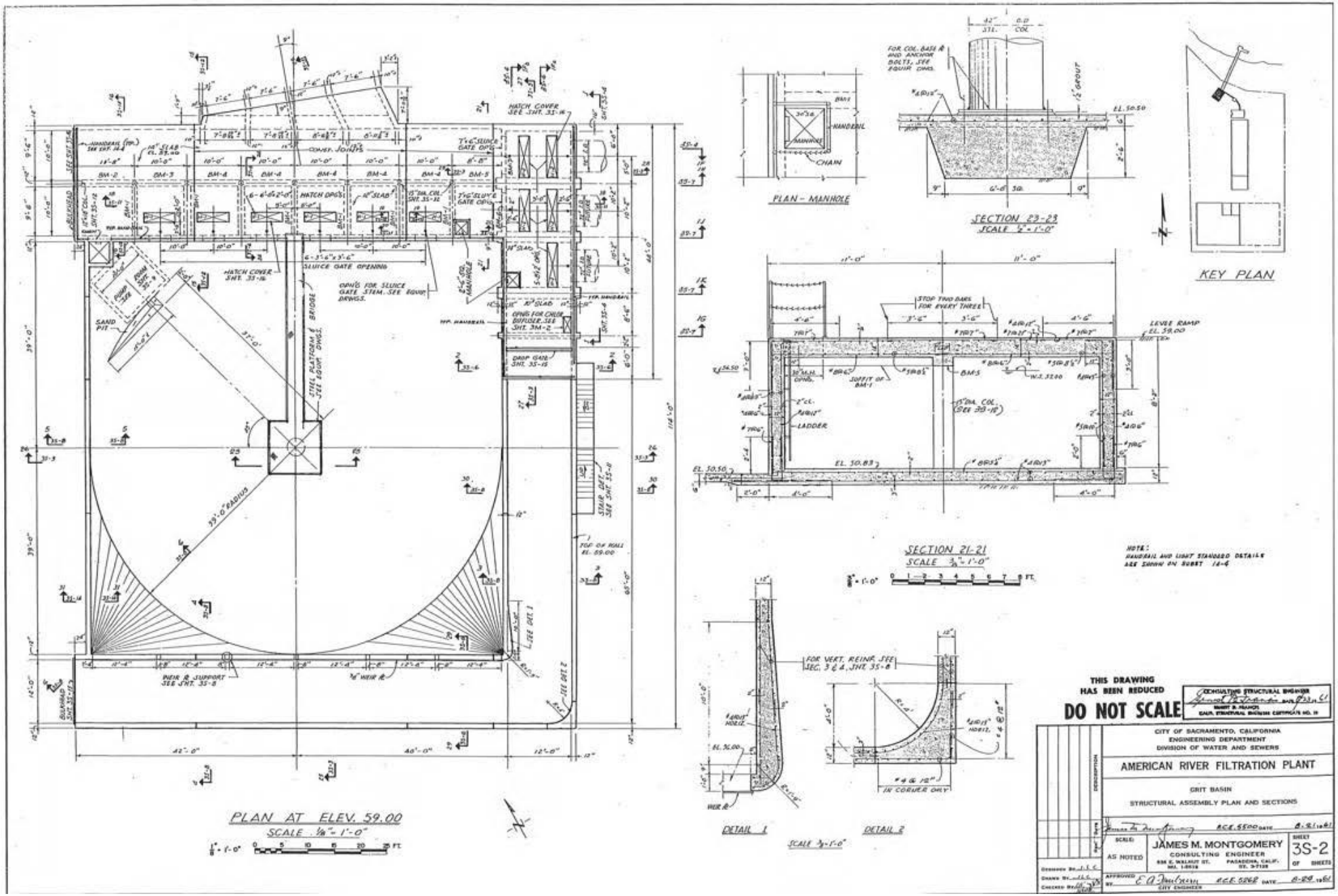
SCALE AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
838 E. WALNUT ST. PASADENA, CALIF.
NO. 1-3618 ST. 3-7128

SHEET 3S-1 OF SHEETS

DESIGNED BY JMC
DRAWN BY JMC
CHECKED BY JMC

APPROVED E. A. Faulkner R.C.E. 5962 DATE 8-24-61
CITY ENGINEER



NOTE:
HANDRAIL AND LIGHT STANDARD DETAILS ARE SHOWN ON SHEET 14-6

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ROBERT B. FRANCIS
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 19

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

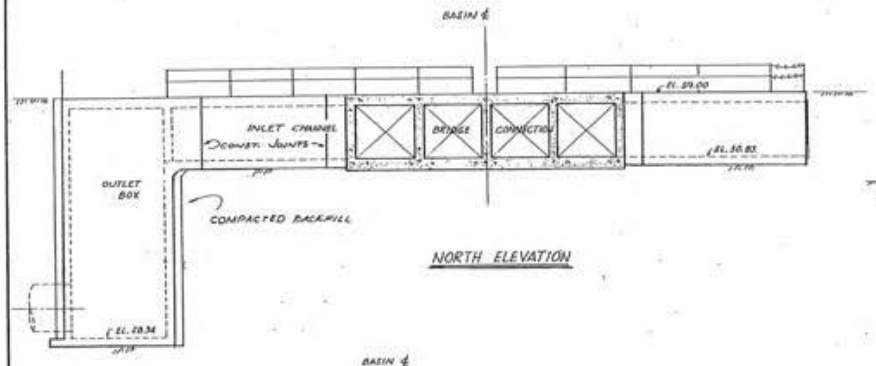
AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
STRUCTURAL ASSEMBLY PLAN AND SECTIONS

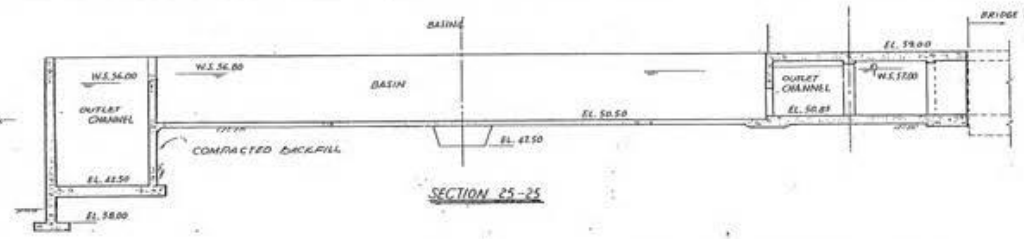
JAMES M. MONTGOMERY
CONSULTING ENGINEER
636 E. WALNUT ST. PASADENA, CALIF.
SYcamore 3-7128

SCALE: AS NOTED
SHEET 3S-2 OF SHEETS

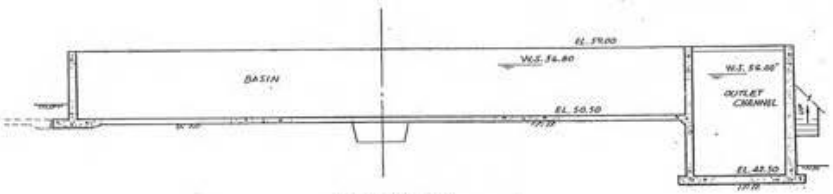
APPROVED E.A. Faulkner CITY ENGINEER R.C.E. 5268 DATE 8-29-1961



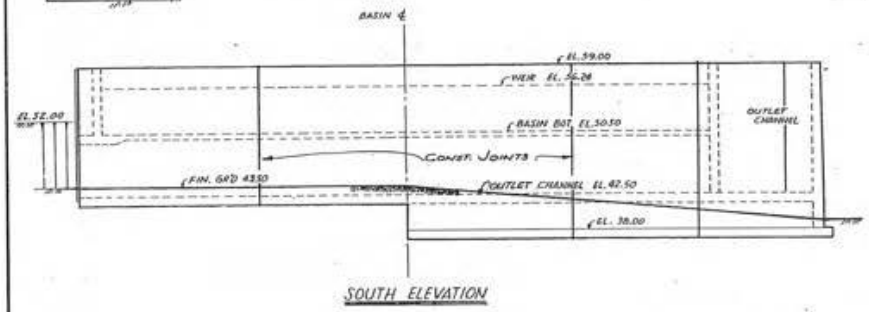
NORTH ELEVATION



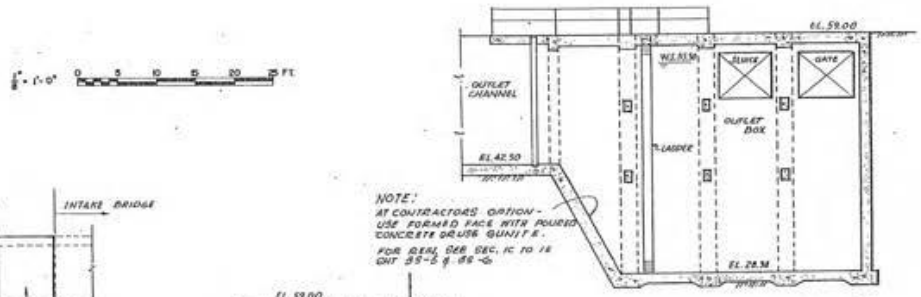
SECTION 25-25



SECTION 26-26

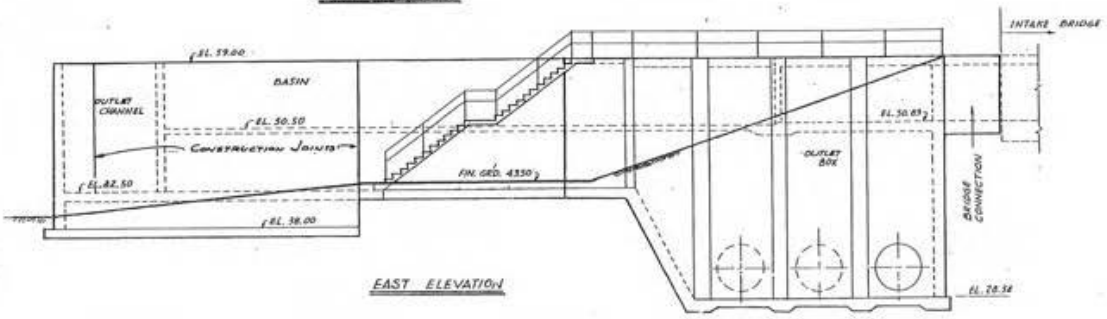


SOUTH ELEVATION

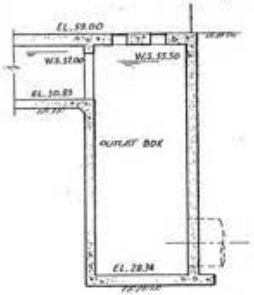


SECTION 27-27

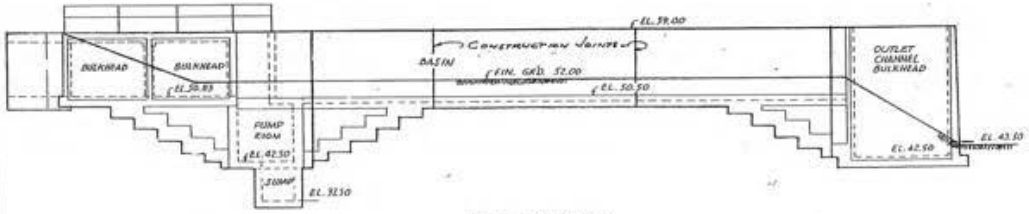
NOTE:
AT CONTRACTORS OPTION - USE FORMED FACE WITH POURED CONCRETE OR USE GUNITE.
FOR REINF. SEE SEC. IC TO IE ON SS-5 & SS-6



EAST ELEVATION



SECTION 28-28



WEST ELEVATION

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
Ernest P. Goodrich DATE 8-24-61
UNDER A MANDEL
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 19

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
ELEVATIONS AND SECTIONS

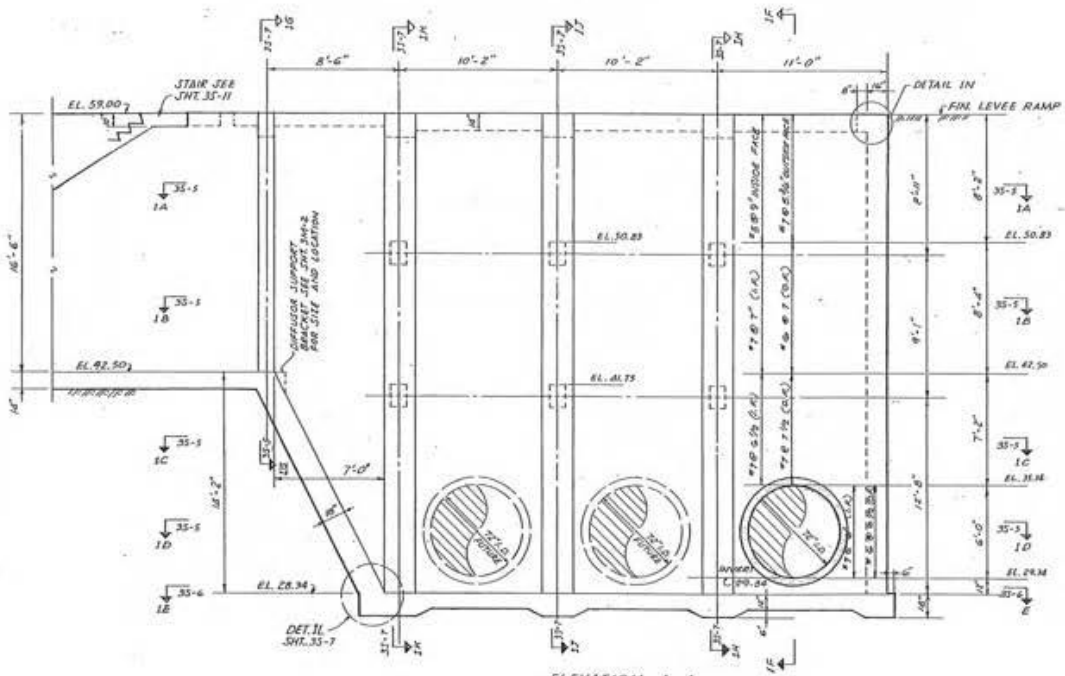
DESIGNED BY J.J.C.
DRAWN BY J.J.C.
CHECKED BY E.P.G.

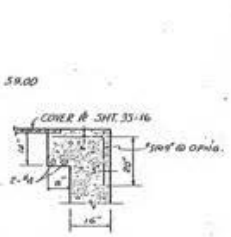
SCALE: 1/8"=1'-0"

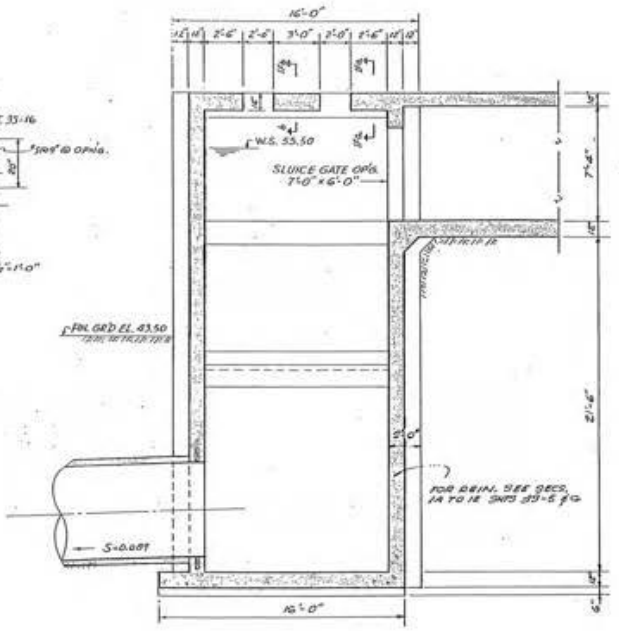
JAMES M. MONTGOMERY
CONSULTING ENGINEER
835 E. WALNUT ST. PASADENA, CALIF.
SYL. 1-0878 SY. 3-7126

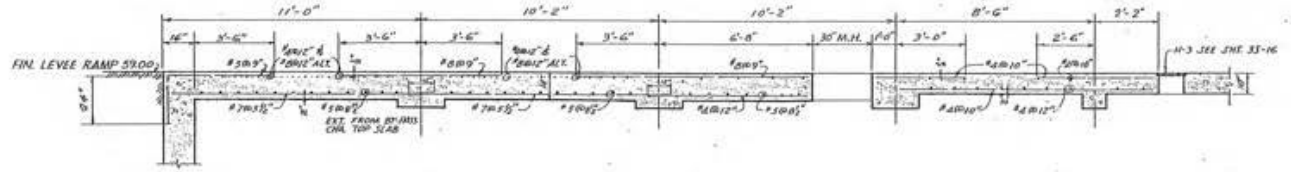
SHEET 3S-3 OF SHEETS

APPROVED E. A. Jenkins R.C.E. 5569 DATE 8-24-61
BY CITY ENGINEER

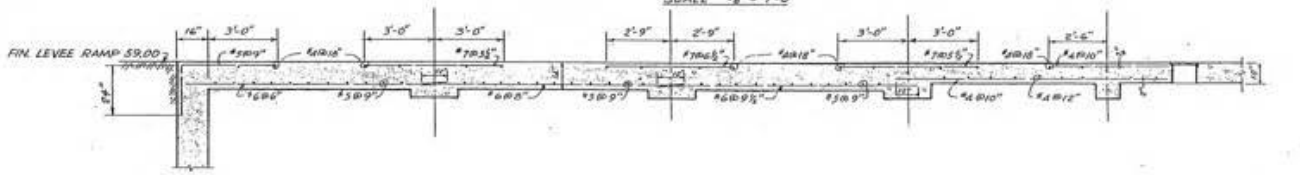








SECTION IF$_a$
SCALE 3/8" = 1'-0"



SECTION IF$_b$
SCALE 3/16" = 1'-0"

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST E. PEARSON
CALIF. STRUCTURAL DIVISION CERTIFICATE NO. 11

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

VERTICAL SECTIONS AT OUTLET BOX

James M. Montgomery R.C.E. 5600 DATE 8-21-1961

SCALE: AS NOTED

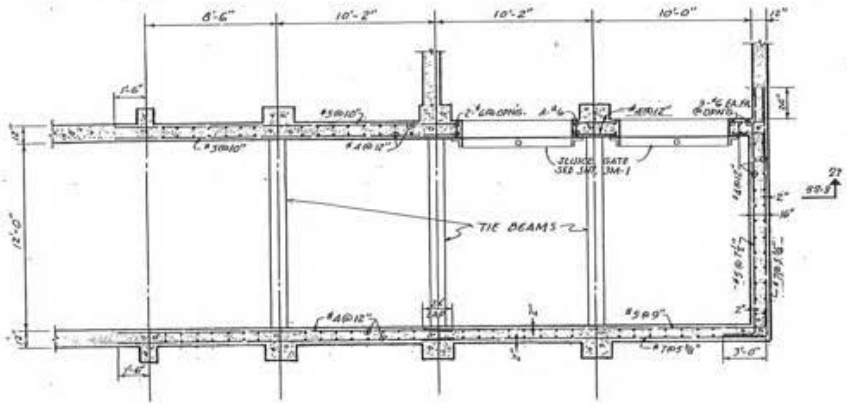
JAMES M. MONTGOMERY
CONSULTING ENGINEER
830 E. WALNUT ST. PASADENA, CALIF.
SY. 9-7128

SHEET 3S-4 OF SHEETS

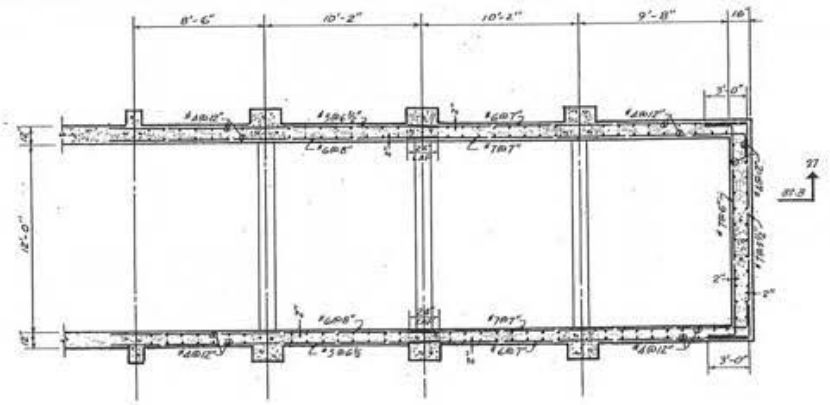
APPROVED C. Faulkner R.C.E. 5269 DATE 8-24-1961
BY CITY ENGINEER

DESIGNED BY J.J.C.
DRAWN BY J.J.C.
CHECKED BY J.M.M.

DESCRIPTION

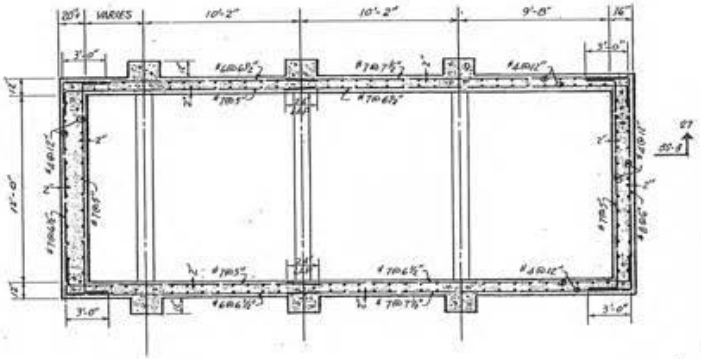


SECTION 1A
ELEV. 50.83 TO 59.00

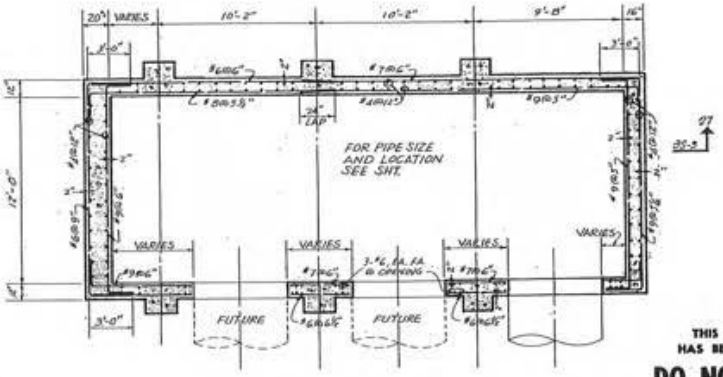


SECTION 1B
ELEV. 42.50 TO 50.83

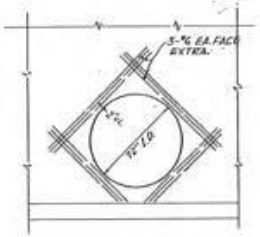
1"=1'-0"



SECTION 1C
ELEV. 35.34 TO 42.50



SECTION 1D
ELEV. 29.34 TO 35.34



TYPICAL REINF. AROUND PIPE OPENING

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST R. PEARCE
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 11

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
HORIZONTAL SECTIONS AT OUTLET BOX

R.C.E. 3500 DATE 8-21-1961

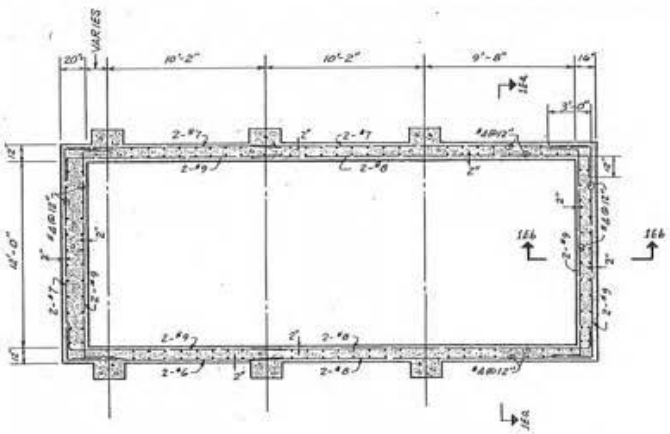
SCALE: 1/8"=1'-0"

JAMES M. MONTGOMERY
CONSULTING ENGINEER
838 E. WALNUT ST. PASADENA, CALIF.
RY. 1-5928 RY. 3-7128

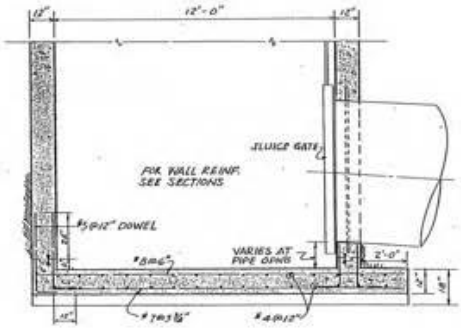
SHEET 3S-5 OF SHEETS

DESIGNED BY J.C.
DRAWN BY J.C.
CHECKED BY

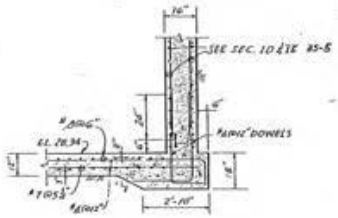
APPROVED BY E.A. Faulkner R.C.E. 5267 DATE 8-29-1961
CITY ENGINEER



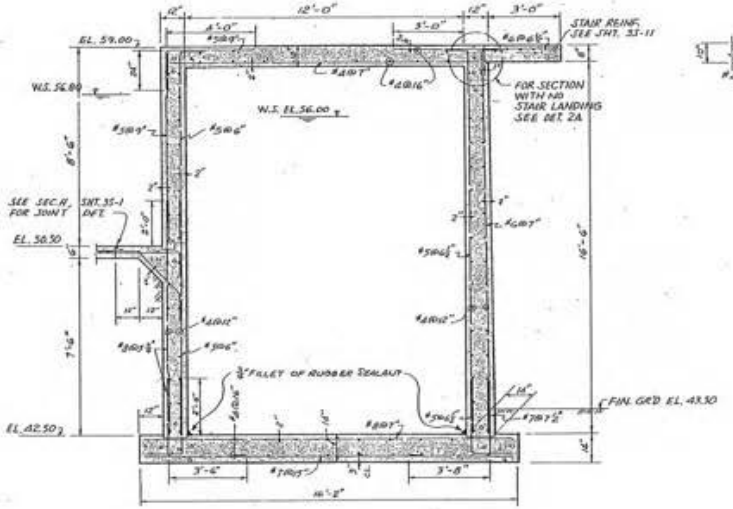
SECTION 1E
ELEV 28.34 TO 29.34
SCALE 1/2" = 1'-0"



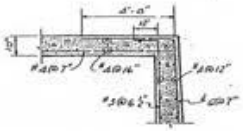
SECTION 1Ea
SCALE 3/8" = 1'-0"



SECTION 1Eb
SCALE 3/8" = 1'-0"

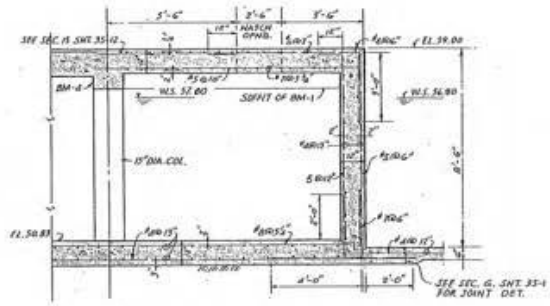


SECTION 2-2
SCALE 3/8" = 1'-0"



DETAIL 2A

1/8" = 1'-0" 0 1 2 3 4 5 6 7 8 FT.



SECTION 2A-2A
SCALE 3/8"=1'-0"

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

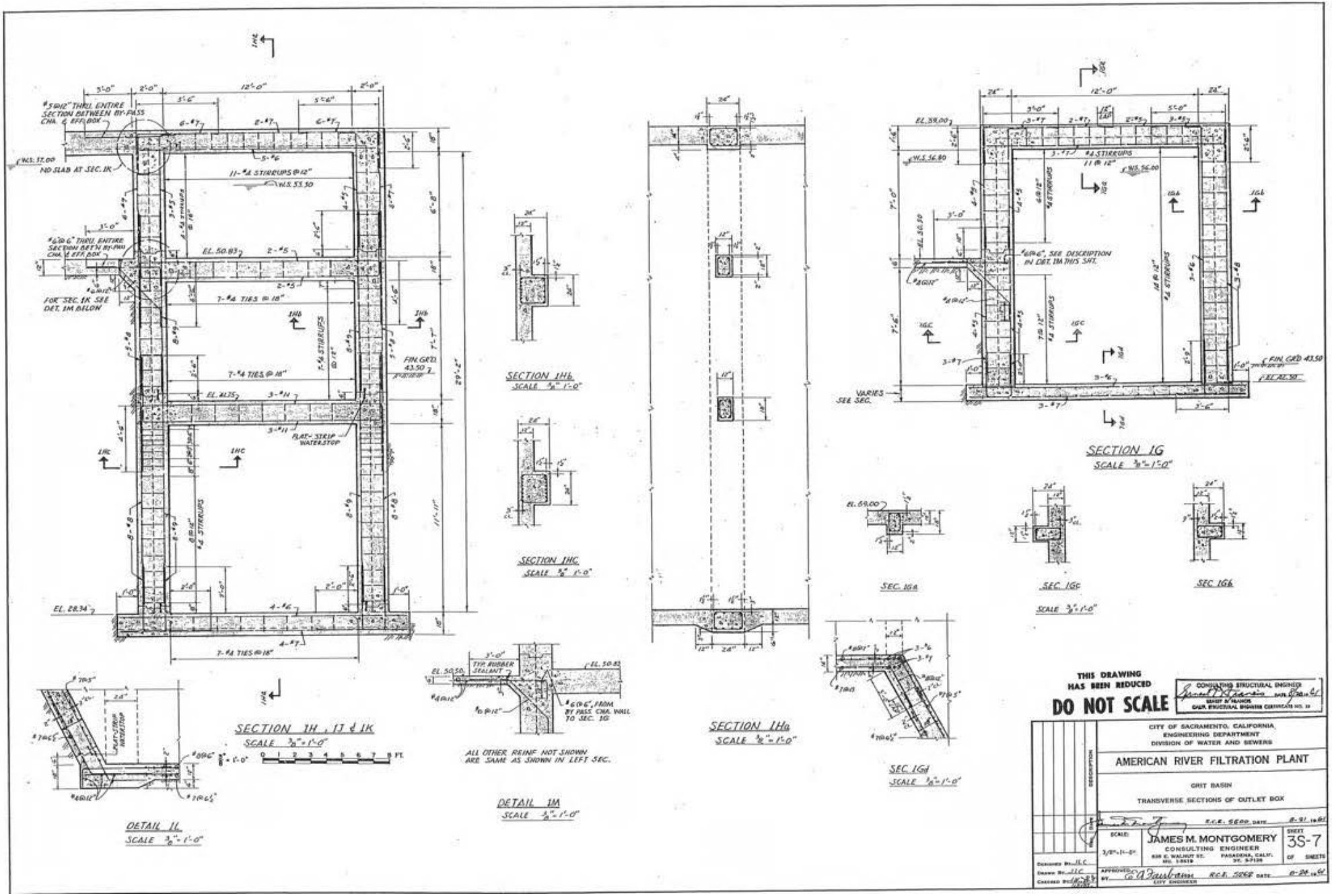
CONSULTING STRUCTURAL ENGINEER
ROBERT D. FRANCIS
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 11

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
MISCELLANEOUS SECTIONS
INLET AND OUTLET CHANNELS

Drawn: [illegible] R.C.E. 5600 DATE 8-31-62
SCALE: AS NOTED
JAMES M. MONTGOMERY
CONSULTING ENGINEER
599 E. WALNUT ST. PASADENA, CALIF.
SHEET 3S-6
OF SHEETS
Designed By: J.L.C.
Drawn By: J.L.C.
Checked By: [illegible]
APPROVED [illegible] CITY ENGINEER R.C.E. 5162 DATE 8-24-62



THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
Ernest D. Kramer DATE 8-28-61
ERNEST D. KRAMER
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 33

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

TRANSVERSE SECTIONS OF OUTLET BOX

R.C.E. 5600 DATE 8-31-1961

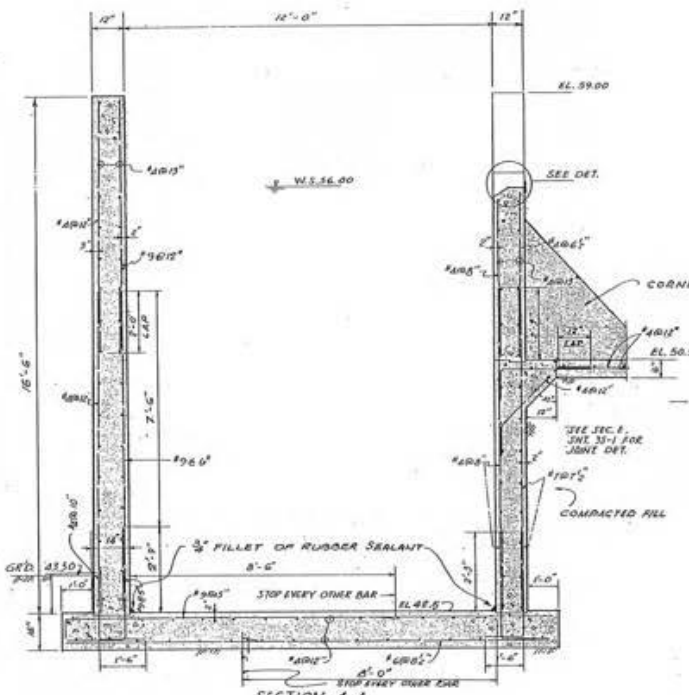
SCALE: 3/8"=1'-0"

JAMES M. MONTGOMERY
CONSULTING ENGINEER
838 E. WALNUT ST. PASADENA, CALIF.
SYC. 1-5518 SYC. 5-7128

SHEET 3S-7 OF SHEETS

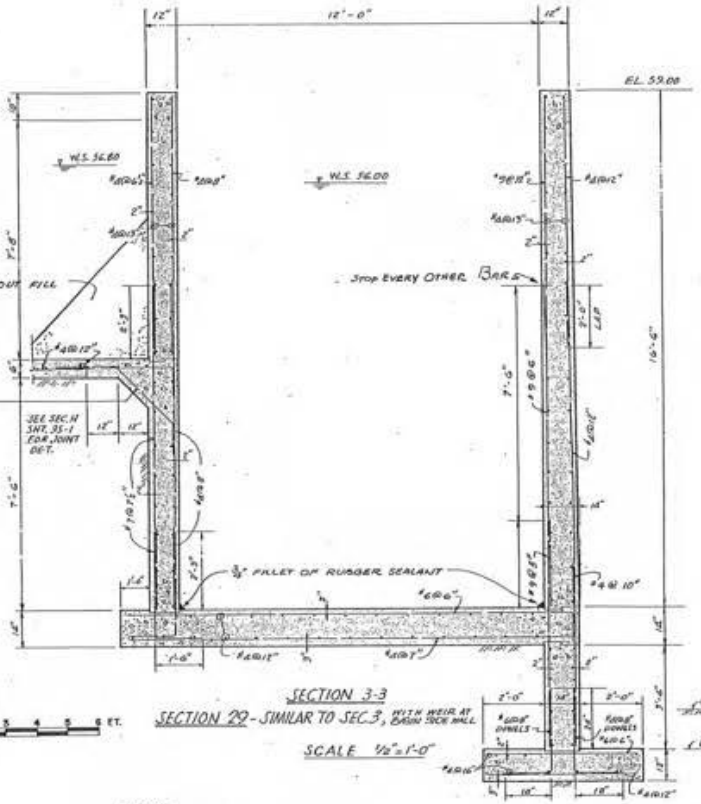
DESIGNED BY: JLC
DRAWN BY: JLC
CHECKED BY:

APPROVED: G. A. Faulkner R.C.E. 5068 DATE 8-24-1961
CITY ENGINEER



SECTION - 4 - 4

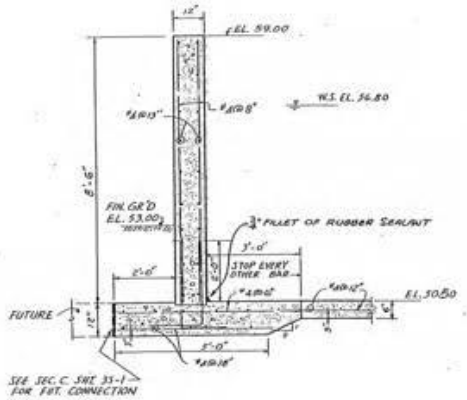
SECTION 30 - SIMILAR TO SEC. 4, WITHOUT WEIR



SECTION 3-3

SECTION 29 - SIMILAR TO SEC. 3, WITH WEIR AT BASIN SIDE WALL

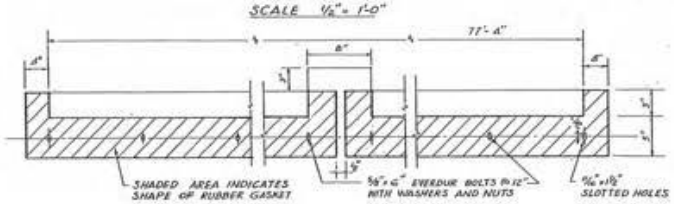
SCALE ½"=1'-0"

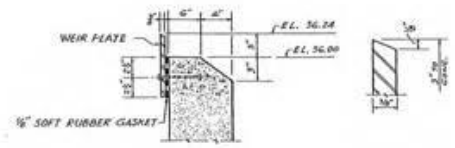


SECTION 5-5

SCALE ½"=1'-0"

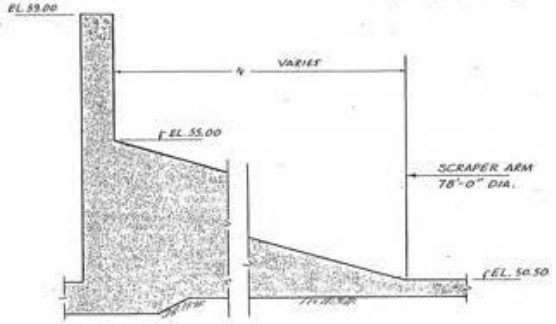
SCALE ½"=1'-0"





WEIR PLATE DETAIL

SCALE 1½"=1'-0"



SECTION 6-6

SCALE ½"=1'-0"

THIS DRAWING HAS BEEN REDUCED

DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. FRANCIS
CAL. STRUCTURAL ENGINEER CERTIFICATE NO. 11

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

STRUCTURAL DETAILS AT OUTLET CHANNEL

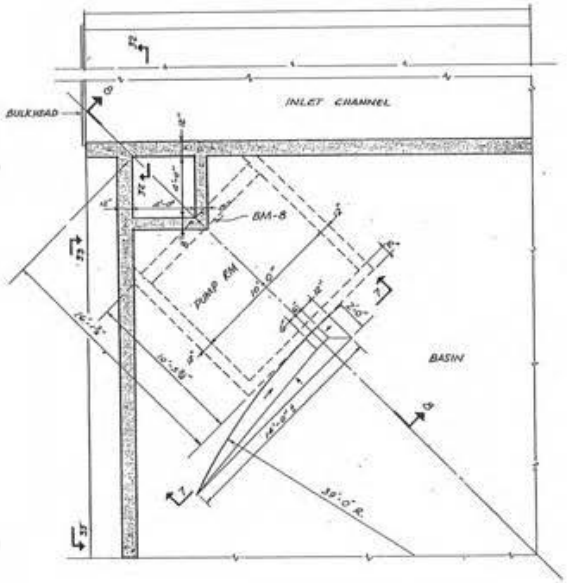
R.C.E. 5500 DATE 8-21-61

SCALE: 1/2"=1'-0"

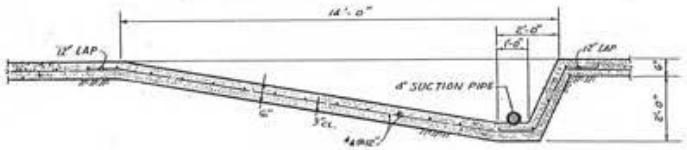
JAMES M. MONTGOMERY
CONSULTING ENGINEER
938 E. WALNUT ST. - PASADENA, CALIF.
SY. 5-7109

SHEET 3S-8 OF SHEETS

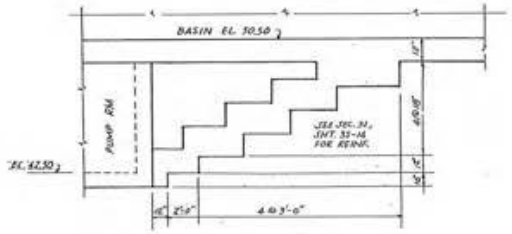
APPROVED BY R.C.E. 5967 DATE 8-29-61



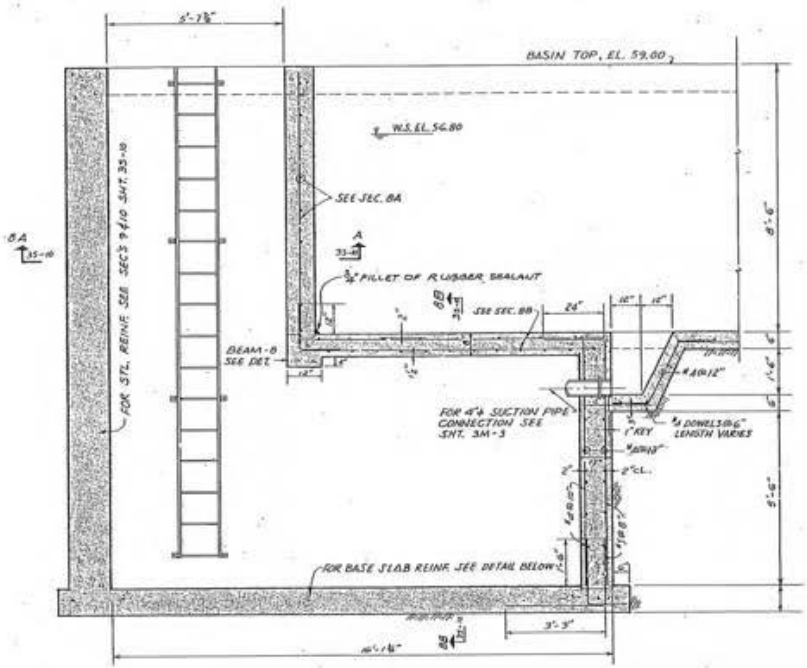
PLAN - PUMP ROOM
(BELOW ELEV. 59.00)
SCALE 1/8" = 1'-0"



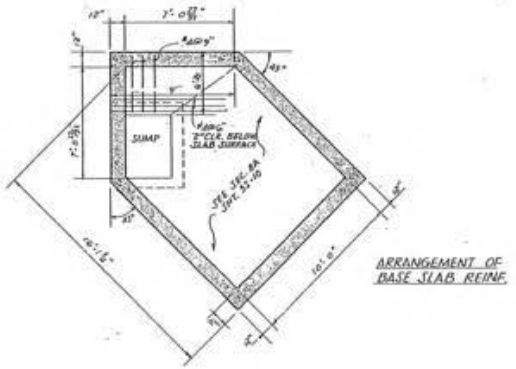
SECTION 7-7
SCALE 1/2" = 1'-0"



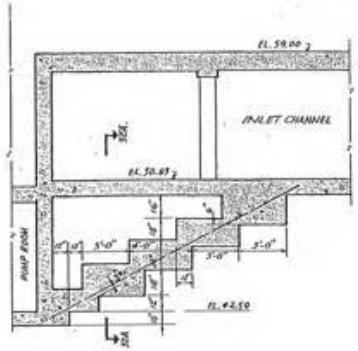
SECTION 33-33
SCALE 1/2" = 1'-0"



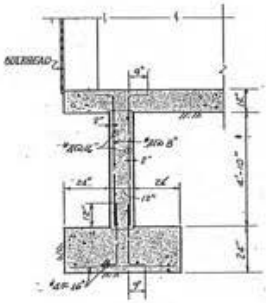
SECTION 8-8
SCALE 1/2" = 1'-0"



ARRANGEMENT OF BASE SLAB REINF.



SECTION 32-32
SCALE 1/2" = 1'-0"



SECTION 32A
SCALE 3/8" = 1'-0"

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. MANOS
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 31

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
PLAN AND SECTIONS AT PUMP ROOM

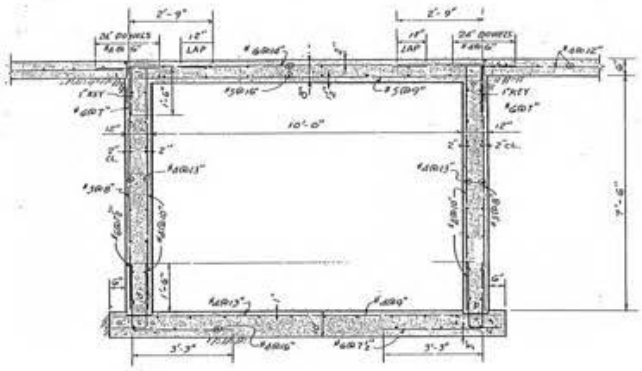
DESIGNED BY J.L.C.
DRAWN BY J.L.C.
CHECKED BY E.D.M.

SCALE: AS NOTED

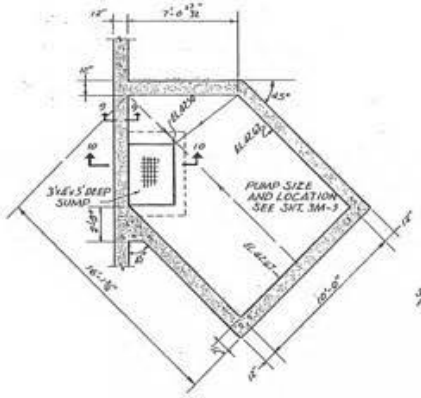
JAMES M. MONTGOMERY
CONSULTING ENGINEER
825 E. WALNUT ST. PASADENA, CALIF.
SYC. 1-8010 ST. 3-7128

SHEET 35-9 OF SHEETS

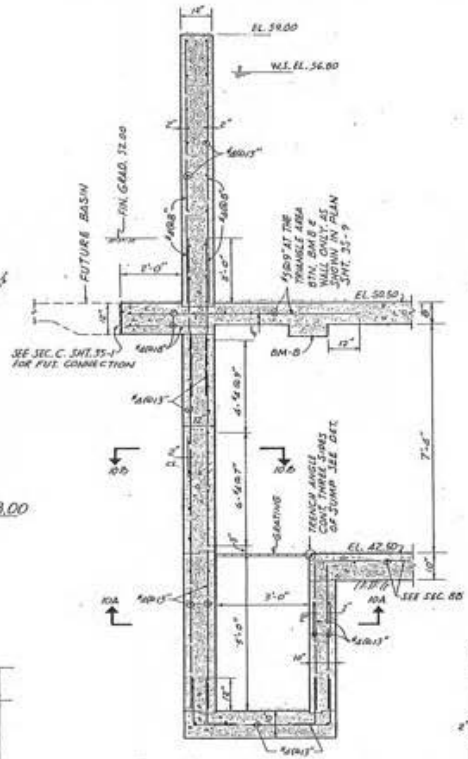
APPROVED E.A. Tauchen R.C.E. 5868 DATE 8-28-61
BY CITY ENGINEER



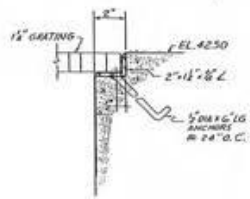
SECTION 8B
SCALE ½"=1'-0"



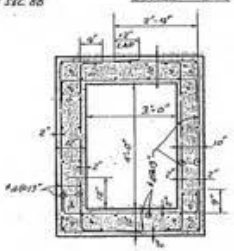
PLAN - PUMP ROOM - BELOW EL. 48.00
SCALE ¼"=1'-0"



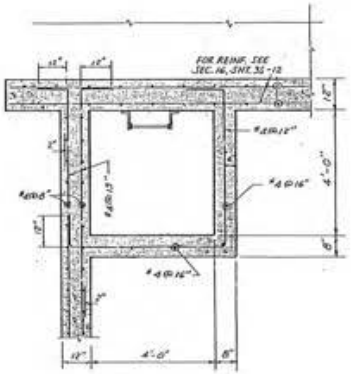
SECTION 10-10
SCALE ½"=1'-0"



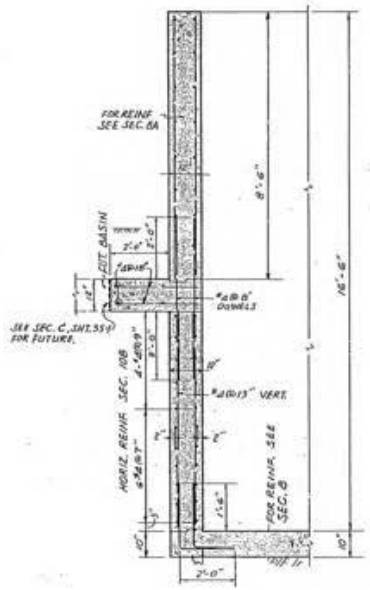
DETAIL OF
TRENCH ANGLE FOR GRATING
SCALE ½"=1"



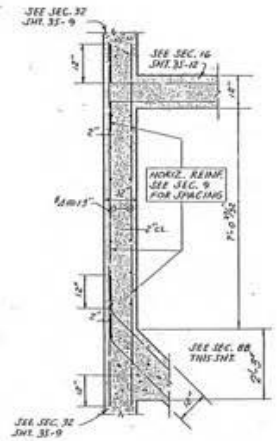
SECTION 10A



SECTION 8A
SCALE ½"=1'-0"



SECTION 9-9
SCALE ½"=1'-0"



SECTION 10B
SCALE ½"=1'-0"

THIS DRAWING
HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. FRANCIS
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 38

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

PUMP ROOM - STRUCTURAL DETAILS

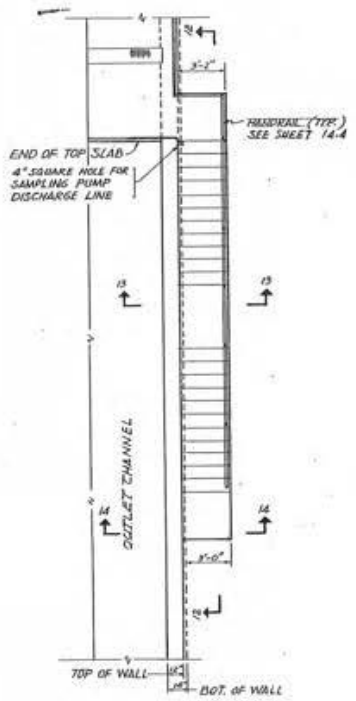
E.C.E. 6500 DATE 8-31-1961

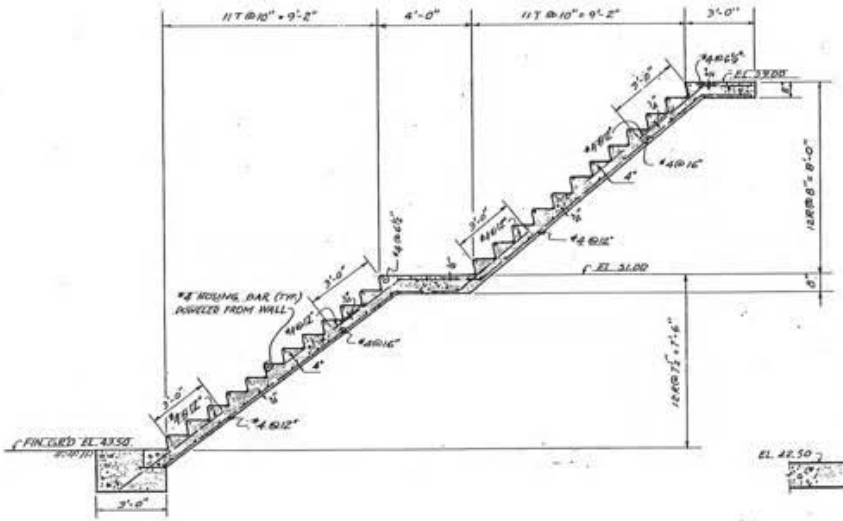
SCALE: 1/2"=1'-0"

JAMES M. MONTGOMERY
CONSULTING ENGINEER
555 E. WALNUT ST. PASADENA, CALIF.
SU. 5-5818 SY. 2-7128

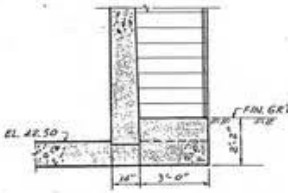
SHEET 3S-10 OF SHEETS

APPROVED BY E. C. Francis E.C.E. 5268 DATE 8-29-1961

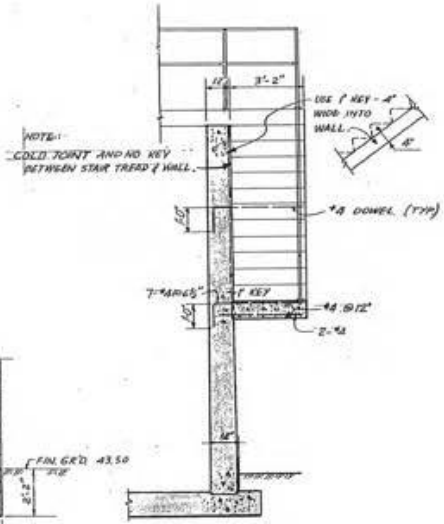




SECTION 12-12
SCALE 3/8" = 1'-0"

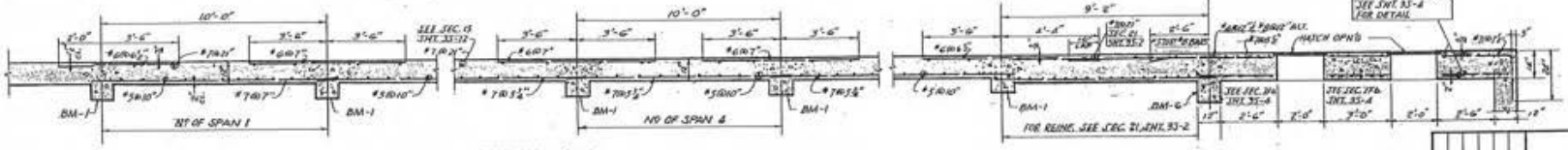


SECTION 14-14
SCALE 3/8" = 1'-0"

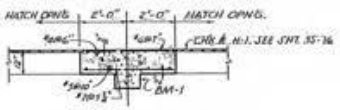


SECTION 13-13
SCALE 3/8" = 1'-0"

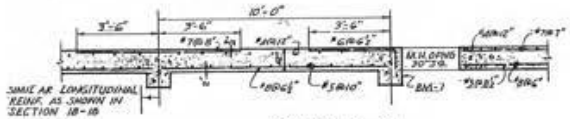
PLAN - STAIRWAY
SCALE 1/4" = 1'-0"



SECTION 18-18
SCALE 3/8" = 1'-0"



SECTION 19-19
SCALE 3/8" = 1'-0"



SECTION 20-20
SCALE 3/8" = 1'-0"

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. FRANCE
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 33

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN

STAIRWAY AND SLAB SECTIONS

R.C.E. 5800 DATE 8-21-61

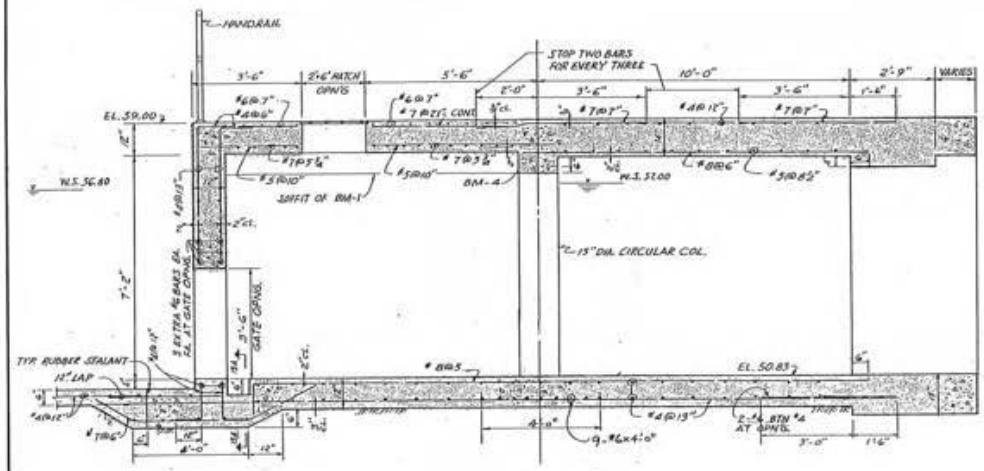
SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
555 E. WALNUT ST. PASADENA, CALIF.
NO. 1-0818 ST. 5-7128

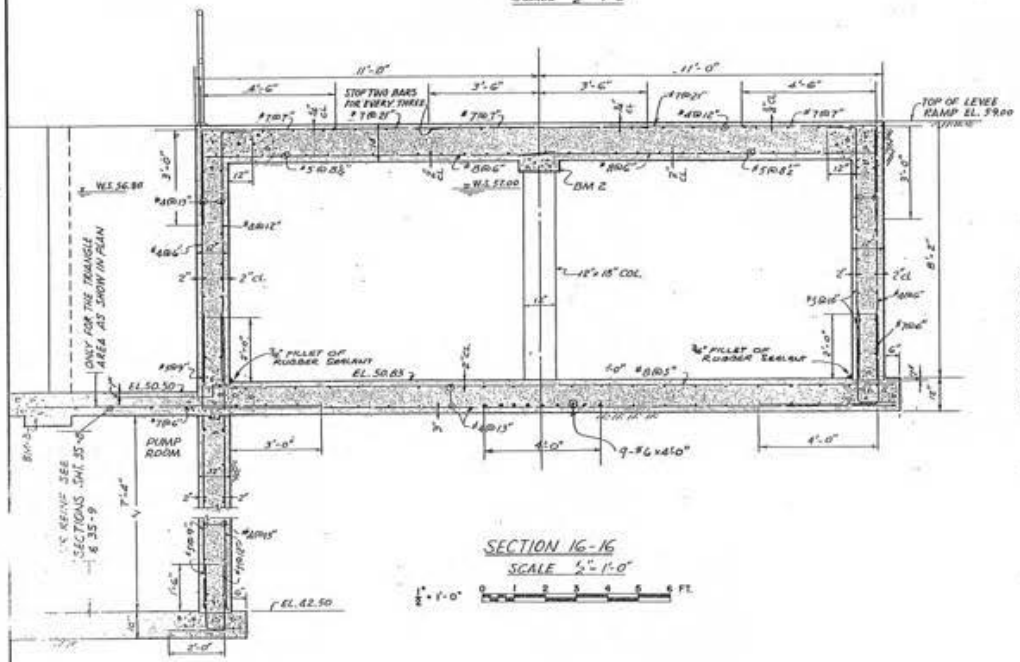
SHEET 3S-11 OF SHEETS

APPROVED BY G.A. Tomlinson R.C.E. 5262 DATE 8-24-61
CITY ENGINEER

DESIGNED BY J.L.C.
DRAWN BY J.L.C.
CHECKED BY E.D.F.

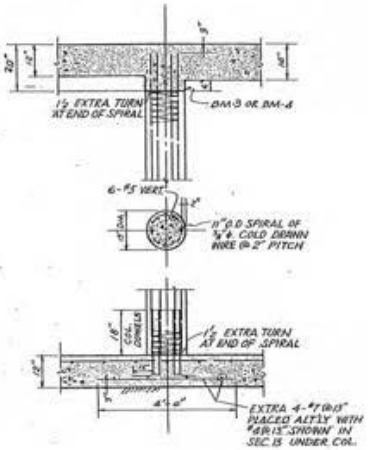


SECTION 15-15
SCALE 1/2" = 1'-0"

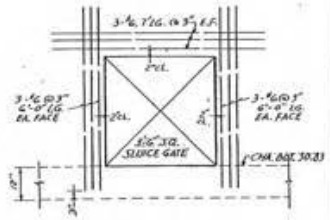


SECTION 16-16
SCALE 1/2" = 1'-0"

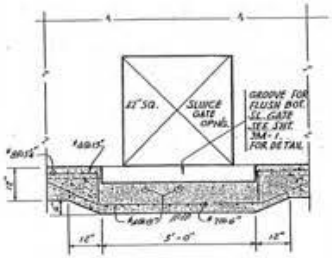
1/2" = 1'-0" 0 1 2 3 4 5 6 FT.



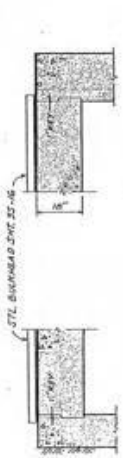
TYPICAL INTERIOR COL.
SCALE 1/2" = 1'-0"
Nº REQ'D. 7



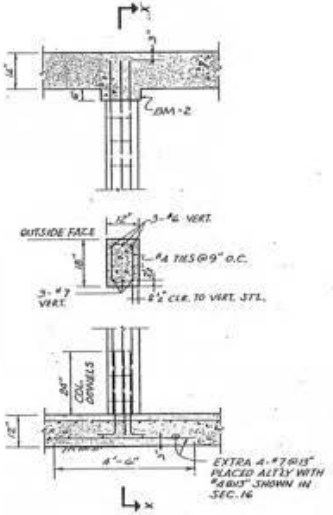
TYPICAL REINF. AROUND GATE OPNG.
Nº REQ'D. 6



SECTION 15A



SEC. X



END COLUMN
SCALE 1/2" = 1'-0"
Nº REQ'D. 1

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST E. FRANCIS
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 33

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
INLET CHANNEL SECTIONS AND DETAILS

A.C.E. 5600 DATE 8-21-1961

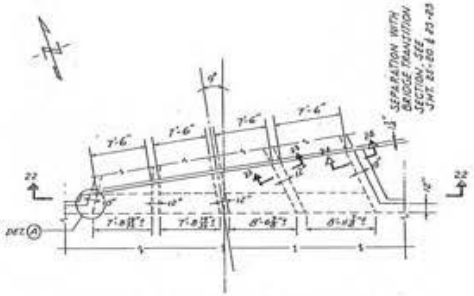
SCALE: 1/2"=1'-0"

JAMES M. MONTGOMERY
CONSULTING ENGINEER
848 E. WALNUT ST. PASADENA, CALIF.
NO. 1-5818 ST. 3-7128

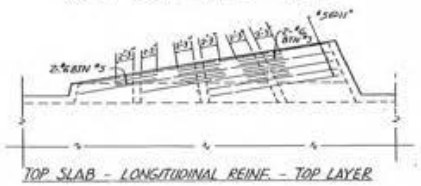
SHEET 3S-12 OF SHEETS

APPROVED BY: G.A. Brazelton CITY ENGINEER A.C.E. 5262 DATE 8-24-1961

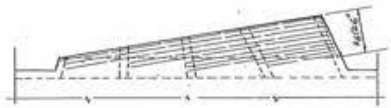
DESIGNED BY J.L.C.
DRAWN BY J.L.C.
CHECKED BY



PLAN – BRIDGE CONNECTION
SCALE 1" = 1'-0"

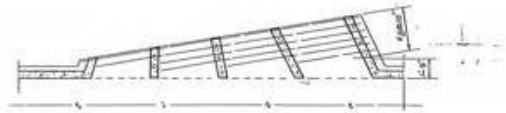


TOP SLAB – LONGITUDINAL REINF. – TOP LAYER

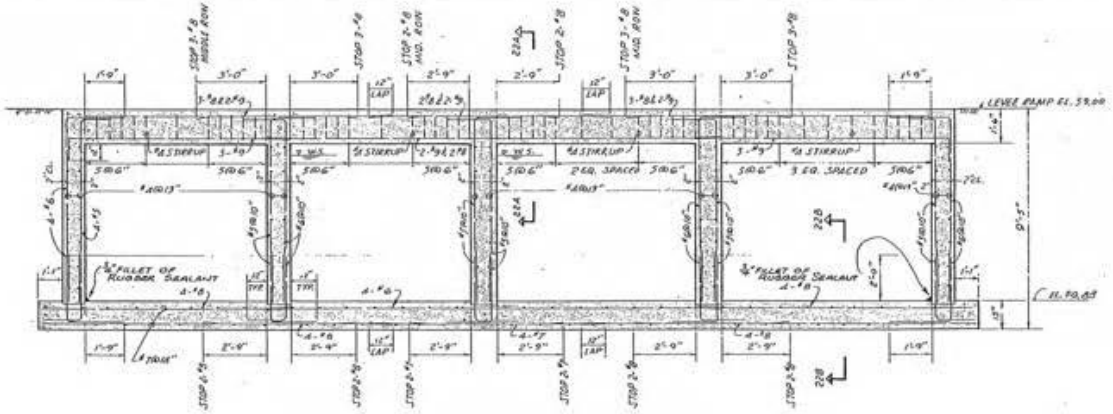


TOP SLAB – LONGITUDINAL REINF. – BOT. LAYER

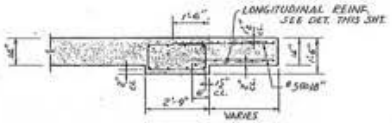
BOT. SLAB – LONGITUDINAL REINF. – TOP LAYER



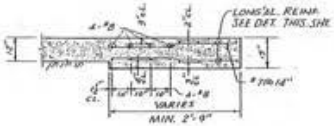
BOT. SLAB – LONGITUDINAL REINF – BOT. LAYER



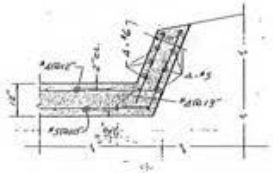
SECTION 22 – 22
SCALE 3/8" = 1'-0"



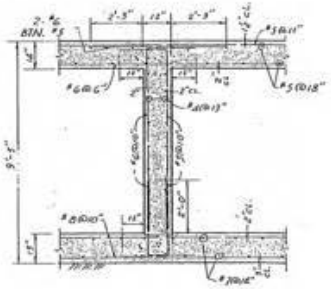
SECTION 22A
SCALE 3/8" = 1'-0"



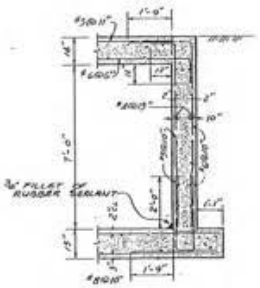
SECTION 22B
SCALE 3/8" = 1'-0"



DETAIL Ⓐ
SCALE 1/2" = 1'-0"



SECTION 23 – 23
SCALE 3/8" = 1'-0"



SECTION 24 – 24
SCALE 3/8" = 1'-0"

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST E. MARCUS
DATE 8/31/61
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 31

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
BRIDGE CONNECTION DETAILS

R.C.E. 5500 DATE 8-31-1961

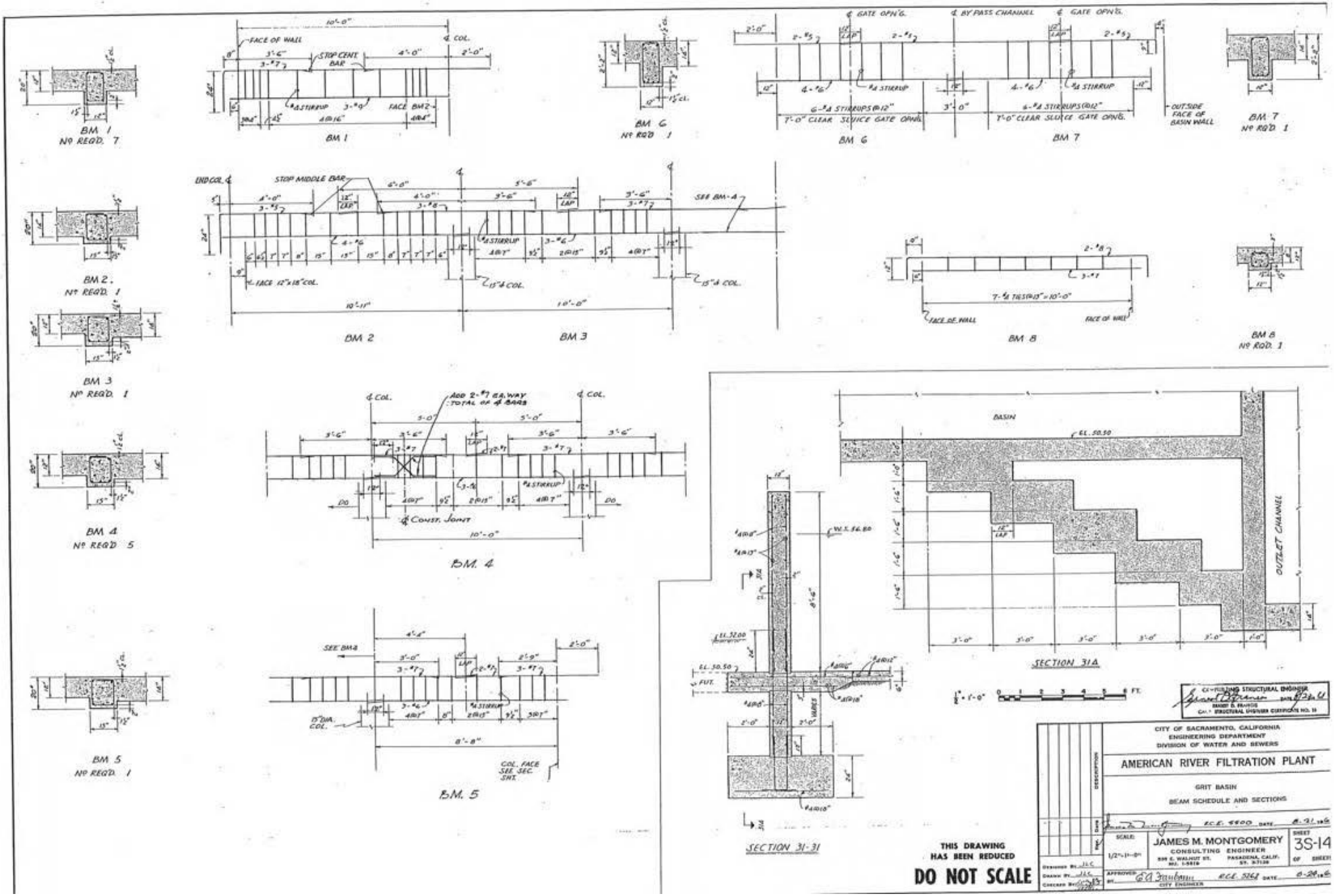
SCALE: AS NOTED

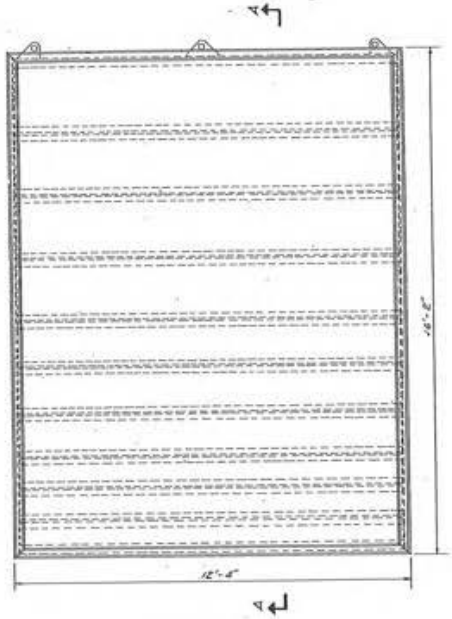
JAMES M. MONTGOMERY
CONSULTING ENGINEER
836 E. WALNUT ST. PASADENA, CALIF.
NO. 1-0618 ST. 2-7128

SHEET 3S-13 OF SHEETS

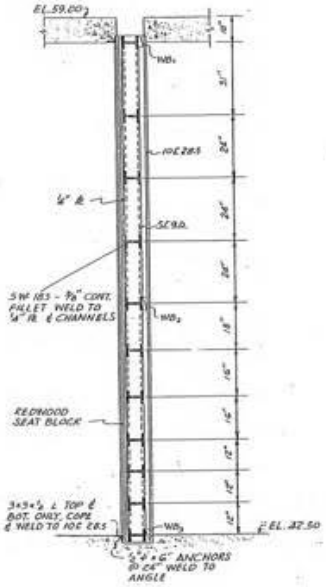
DESIGNED BY: J.M.M.
DRAWN BY: J.M.C.
CHECKED BY: J.M.M.

APPROVED BY: E.A. Bailey
R.C.E. 5062 DATE 8-24-1961
CITY ENGINEER


BM 1
Nº REQD. 7
BM 1
BM 6
Nº REQD 1
BM 6
BM 7
BM 7
Nº REQD 1
BM 2.
Nº REQD. 1
BM 2
BM 3
BM 3
Nº REQD. 1
BM 8
Nº REQD. 1
BM 4
Nº REQD 5
BM. 4
BM 5
Nº REQD. 1
BM. 5
SECTION 31A
SECTION 31-31
BASIN
OUTLET CHANNEL
EL. 50.50
THIS DRAWING
HAS BEEN REDUCED
DO NOT SCALE
CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS
AMERICAN RIVER FILTRATION PLANT
GRIT BASIN
BEAM SCHEDULE AND SECTIONS
JAMES M. MONTGOMERY
CONSULTING ENGINEER
PASADENA, CALIF.
SHEET
3S-14



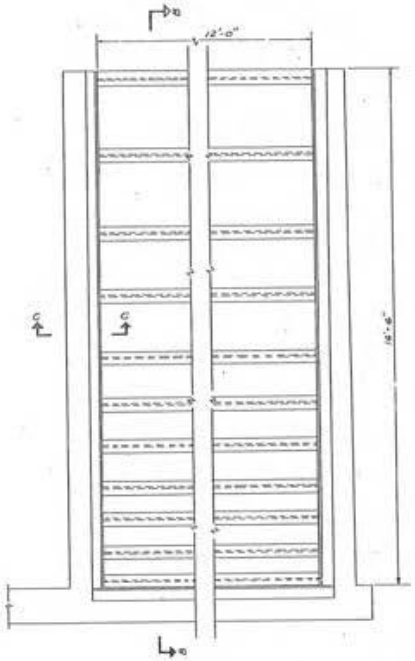
ELEVATION – GATE
SCALE ½" = 1'-0"



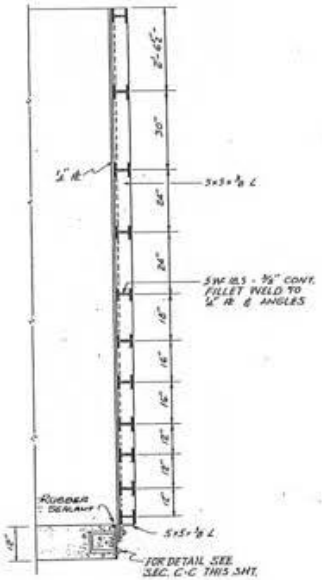
SECTION A-A
SCALE ½" = 1'-0"

NOTE: FOR GATE ASSEMBLY DETAIL SEE SHT. 55-14

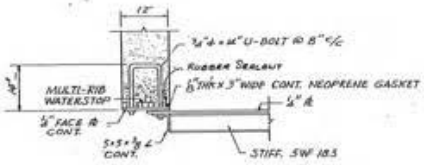
½" = 1'-0" 0 1 2 3 4 5 6 FT.



ELEVATION – BULKHEAD
SCALE ½" = 1'-0"



SECTION B-B
SCALE ½" = 1'-0"



SECTION C-C
SCALE ¾" = 1'-0"

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. KRANICH
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 11

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
BULKHEAD AND STOP GATE
IN OUTLET CHANNEL

R.C.E. 9600 DATE 8-21-61

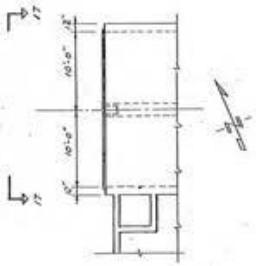
SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
888 E. WALNUT ST. PASADENA, CALIF.
SYC. 3-7128

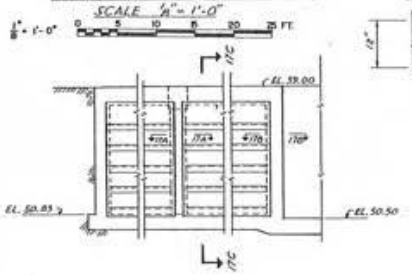
SHEET 3S-15 OF SHEETS

DESIGNED BY JJC
DRAWN BY JJC
CHECKED BY

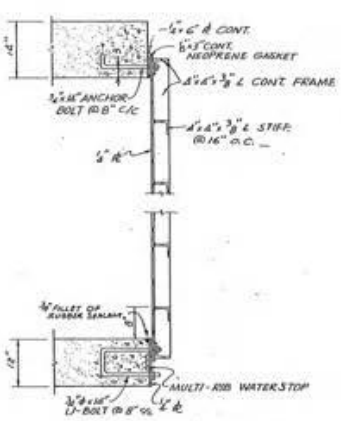
APPROVED BY R.C.E. 5262 DATE 8-28-61
CITY ENGINEER



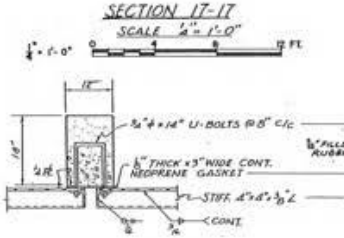
PLAN - WEST END OF BY PASS CHA.
SCALE 1/4" = 1'-0"



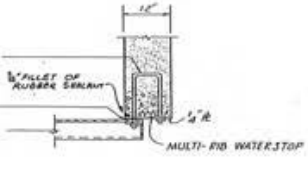
SECTION 17-17
SCALE 1/4" = 1'-0"



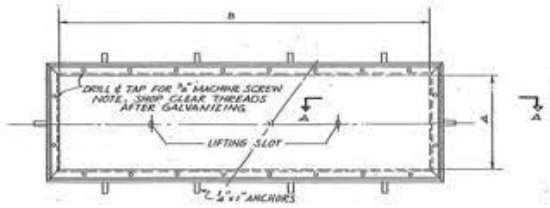
SECTION 17C
SCALE 3/4" = 1'-0"



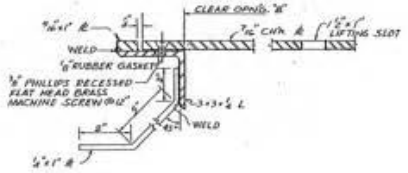
SECTION 17A
SCALE 3/4" = 1'-0"



SECTION 17B
SCALE 3/4" = 1'-0"



PLAN - HATCH COVER
SCALE 3/4" = 1'-0"



SECTION A-A
NO SCALE

HATCH COVER SCHEDULE

MK	A	B	Nº REQ'D	REF. DRWG.
H-1	2'-0"	6'-0"	6	35-1
H-2	2'-0"	8'-0"	5	35-1
H-3	9"	12'-6"	1	35-2

THIS DRAWING HAS BEEN REDUCED
DO NOT SCALE

CONSULTING STRUCTURAL ENGINEER
ERNEST D. FRANCIS DATE 8/21/61
CALIF. STRUCTURAL ENGINEER CERTIFICATE NO. 51.

CITY OF SACRAMENTO, CALIFORNIA
ENGINEERING DEPARTMENT
DIVISION OF WATER AND SEWERS

AMERICAN RIVER FILTRATION PLANT

GRIT BASIN
BULKHEAD IN INLET CHANNEL
AND HATCH COVERS

R.C.E. 5600 DATE 8-21-1961

SCALE: AS NOTED

JAMES M. MONTGOMERY
CONSULTING ENGINEER
555 E. WALNUT ST. PASADENA, CALIF.
SY. 6-0818 SY. 6-7128

SHEET 35-16 OF SHEETS

APPROVED R.C.E. 5267 DATE 8-29-61

DESIGNED BY: JJC
DRAWN BY: JJC
CHECKED BY: JJC

DESCRIPTION | DATE | REV.

Attachment 4

WOOD RODGERS

FWTP INTAKE BRIDGE EVALUATION

Wood Rodgers Job #: 8640_ _ _

REFERENCES: CITY OF SACRAMENTO, CALIFORNIA - DIVISION OF WATER AND SEWERS, Specifications for Construction of American River Filtration Plant, Part 2 Drawings, dated 1961

CONTENTS: Intake Bridge Evaluation for Proposed Temporary Loading

SUMMARY: Proposed vehicular loading: 2017 Dalmer Trucks Freightliner 114SD Severe Duty Crane (76,000 lbs gross weight).

Assumed Intake Bridge cells full.

Components evaluated:

Bridge Box Girder - Flexure	ok
Bridge Box Girder - Shear	ok
Bent Cap - Flexure	ok
Bent Cap - Shear	ok
Bridge Deck	ok
Column	ok
Foundation	ok

CONCLUSION: FWTP Intake Bridge can support the proposed loading (76,000 lb gross weight crane)

GENERAL: Travel restrictions of proposed vehicle:

Center of bridge where possible.

REGISTERED PROFESSIONAL ENGINEER
GERARDO V. CALVILLO, JR.
Sept. 3, 2020
No. 2920
Exp. 06/30/22
STRUCTURAL
STATE OF CALIFORNIA

CLIENT: **CITY OF SACRAMENTO DEPARTMENT OF UTILITIES**
Sacramento, California

PREPARED BY: **GDM**

CHECKED BY: **GERARDO V. CALVILLO, JR., SE**

DATE: **SEPTEMBER 3, 2020**

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

Job No. 8640 Job FWTP Intake Bridge By GDM Date 09/2020
Client City of Sacramento Subject Structural Evaluation Chk'd Date

Revise Table 3.4.1-1 as follows:

Table 3.4.1-1 – Load Combinations and Load Factors

Load Combination / Limit State	*DC* *DD* *DW* *EH* *EV* *ES* *EL* ***PS*** ***CR*** ***SH***	LL_{IM} *IM* *CE* *BR* *PL* *LS*	LL_{Permit} ***IM*** ***CE***	*WA*	*WS*	*WL*	*FR*	*TU* ~~*CR*~~ ~~*SH*~~	*TG*	*SE*	*EQ* *IC* *CT* *CV* (use only one)
STRENGTH I	γ_p	1.75	**0.0**	1.0	**0.0**	**0.0**	1.0	0.50/ 1.20	γ_{TG}	γ_{SE}	**0.0**
STRENGTH II- DF, LVR,SUB	γ_p	**0.0**	1.35	1.0	**0.0**	**0.0**	1.0	0.50/ 1.20	γ_{TG}	γ_{SE}	**0.0**
STRENGTH III	γ_p	**0.0**	**0.0**	1.0	1.4	**0.0**	1.0	0.50/ 1.20	γ_{TG}	γ_{SE}	**0.0**
STRENGTH IV	γ_p	**0.0**	**0.0**	1.0	**0.0**	**0.0**	1.0	0.50/ 1.20	***0.0***	***0.0***	**0.0**
STRENGTH V	γ_p	1.35	**0.0**	1.0	0.4	1.0	1.0	0.50/ 1.20	γ_{TG}	γ_{SE}	**0.0**
EXTREME EVENT I	~~γ_p~~ **1.0**	γ_{EQ} **0.0**	**0.0**	1.0	**0.0**	**0.0**	1.0	**0.0**	**0.0**	**0.0**	1.00 (EQ)
EXTREME EVENT II	~~γ_p~~ **1.0**	0.5	**0.0**	1.0	**0.0**	**0.0**	1.0	**0.0**	**0.0**	**0.0**	1.00 (IC or CT or CV)
SERVICE I	1.00	1.00	**0.00**	1.00	0.30	1.0	1.0	1.00/ 1.20	γ_{TG}	γ_{SE}	**0.0**
SERVICE II	1.00	1.30	**0.00**	1.00	**0.0**	**0.0**	1.0	1.00/ 1.20	**0.0**	**0.0**	**0.0**
SERVICE III	1.00	0.80	**0.00**	1.00	**0.0**	**0.0**	1.0	1.00/ 1.20	γ_{TG}	γ_{SE}	**0.0**
SERVICE IV	1.00	**0.00**	**0.00**	1.00	0.70	**0.0**	1.0	1.00/ 1.20	**0.0**	1.0	**0.0**
FATIGUE I— LL_{IM}, *IM* & *CE* ONLY	**0.00**	~~0.75~~ 0.875/ 1.75	**0.00**	**0.00**	**0.00**	**0.0**	**0.0**	**0.00**	**0.0**	**0.0**	**0.00**
FATIGUE II— LL_{Permit} & *IM*	**0.00**	**0.00**	**1.00**	**0.00**	**0.00**	**0.0**	**0.0**	**0.00**	**0.0**	**0.0**	**0.00**

v3.06.01

Revise Table 3.4.1-2 as follows:

Table 3.4.1-2 Load Factors for Permanent Loads, γ_p

Type of Load		Load Factor Maximum	Load Factor Minimum
DC: Component and Attachments		1.25	0.90
***DC*: Strength IV, only**		1.50	0.90
DD: Downdrag	**Piles, α Tomlison Method**	1.40	0.25
	Piles, λ Method	1.05	0.30
	Drilled Shafts, O'Neill and Reese (*1999*) Method	1.25	0.35
DW: Wearing Surfaces and Utilities		1.50	0.65
EH: Horizontal Earth Pressure			
• Active		1.50	0.90
• At-Rest		1.35	0.90
EL: Locked-in ~~Erection~~ Construction Stresses		1.00	1.00
EV: Vertical Earth Pressure			
• Overall Stability		1.00	N/A
• Retaining Walls and Abutments		1.35	1.00
• Rigid Buried Structure		1.30	0.90
• Rigid Frame		1.35	0.90
• Flexible Buried Structures other than Metal Box Culverts		1.95	0.90
• Flexible Metal Box Culverts		1.50	0.90
ES: Earth Surcharge		1.50	0.75
PS: Secondary Forces from Post-tensioning			
• Substructure-Supporting Non-segmental Superstructures When Using I_g		0.50	0.50
• All Other Structures		1.00	1.00
CR: Force due to Creep			
SH: Force due to Shrinkage			
• Superstructures - Segmental		1.25	0.90
• Superstructures-Non-segmental		1.00	1.00
• Substructures-Supporting Segmental Superstructures (see 3.12.4, 3.12.5)		1.25	0.90
• Substructure-Supporting Non-segmental Superstructures When Using I_g		0.50	0.50
CR, SH: Strength IV Only		1.50	0.90

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

Sheet 4
Rev. No.

Job No. 8640 Job FWTP Intake Bridge By GDM Date 09/2020
Client City of Sacramento Subject Structural Evaluation Chk'd Date

3.3.2 Load and Load Designation

Revise as follows:

The following permanent and transient loads and forces shall be considered:

- Permanent Loads

CR = force effect due to creep
DD = downdrag force
DC = dead load of structural components and non-structural attachments
DW = dead load of wearing surfaces and utilities
EH = horizontal earth pressure load
EL = miscellaneous locked-in force effects resulting from the construction process.
ES = earth surcharge load
EV = vertical pressure from dead load of earth fill
PS = secondary forces from post-tensioning
SH = force effect due to shrinkage

- Transient Loads

BR = vehicular braking force
CE = vehicular centrifugal force
~~*CR* = creep~~
CT = vehicular collision force
CV = vessel collision force
EQ = earthquake load
FR = friction force
IC = ice load
IM = vehicular dynamic load allowance
LL = vehicular live load
LS = live load surcharge
PL = pedestrian live load
SE = force effect due to settlement
~~*SH* = shrinkage~~
TG = force effect due to temperature gradient
TU = force effect due to uniform temperature
WA = water load and stream pressure
WL = wind on live load
WS = wind load on structure

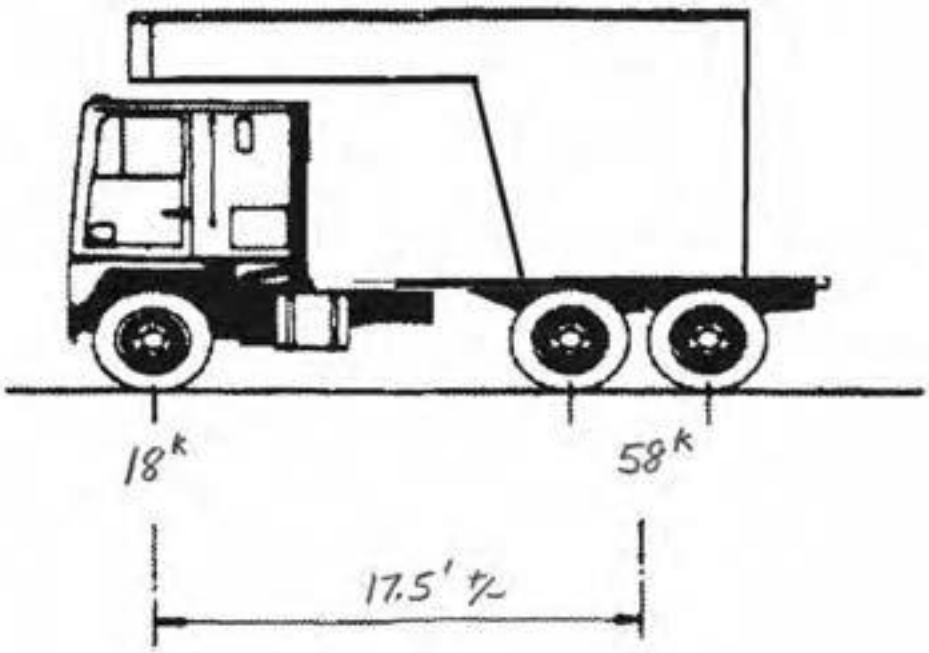
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

Sheet 5
Rev. No.

Job No. 8640 Job FWTP Intake Bridge By GDM Date 09/2020
Client City of Sacramento Subject Structural Evaluation Chk'd Date

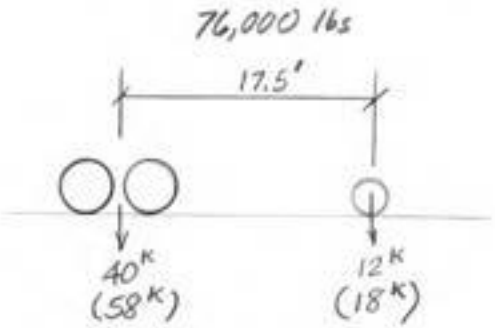
Truck Load

Gross Weight = 76,000 lbs



114SD

Specs
Brochures
Videos
Photos
Driver Manuals
Maintenance Manuals



Specs

114SD

Class
7/8

Horsepower
260-505 HP

Torque
720 to 1850 lb-ft

GVW
92,000 lbs. (independent of lift axles)

Cab/Sleeper Configurations
Day Cab

- 114" BBC

Extended Cab

- 140" BBC

Crew Cab

Get a Quote (/trucks/request-a-quote/) Find a Dealer (/dealer-search/)

Engines

- Detroit DD13 (/demand-detroit/engines/dd13/)
- Detroit DD8 (/demand-detroit/engines/dd8/)
- Cummins L9
- Cummins X12 (/x12/)

Axles

- Detroit (/demand-detroit/detroit-axles/)
- Meritor

Suspensions

- Taper Leaf
- Flat Leaf Spring
- Airliner®
- TufTrac®
- Haulmaax®
- Primaax®/Firemaax®
- Chalmers

Transmissions

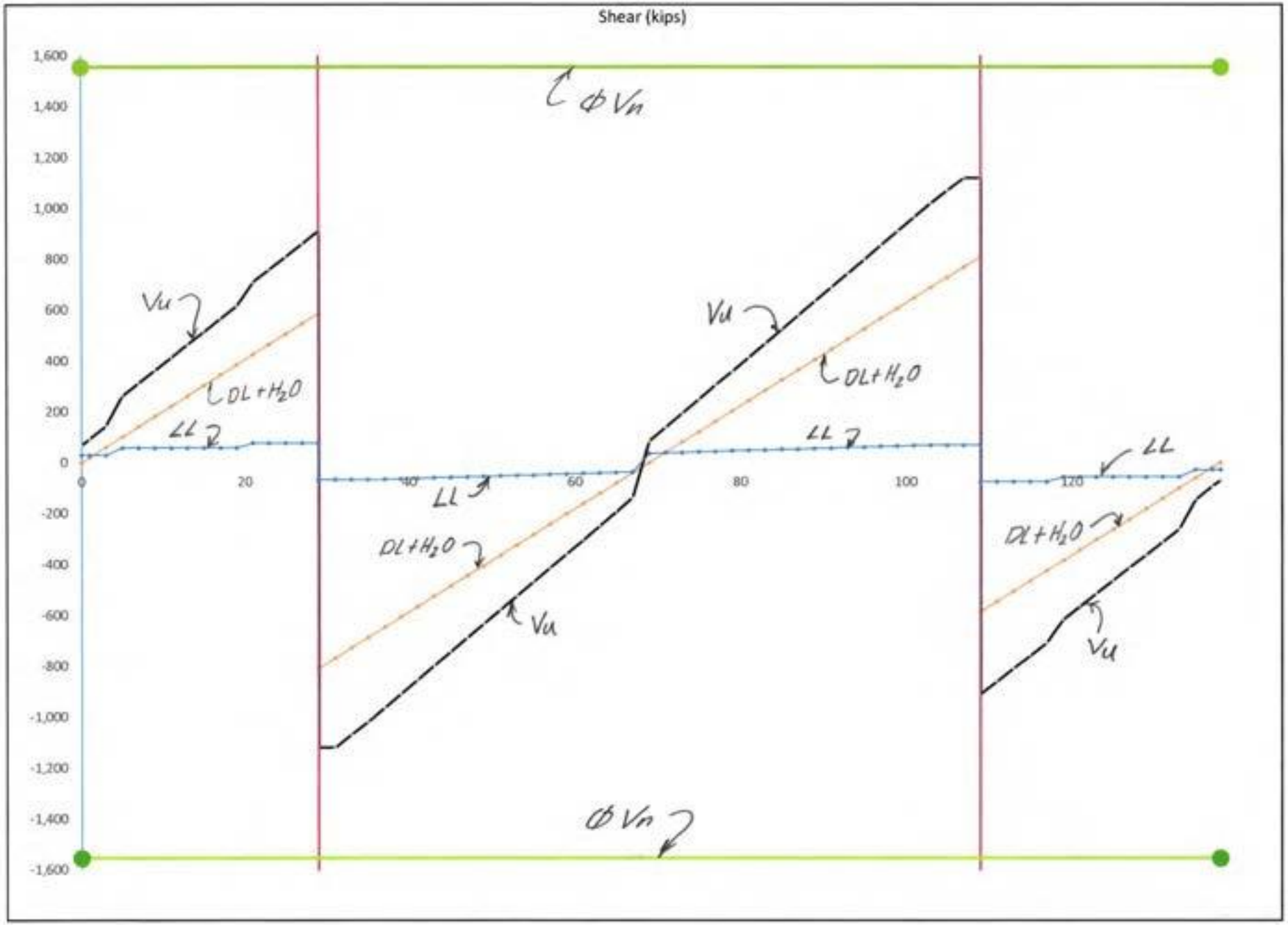
- Manual
  - Eaton Fuller® 8ALL
  - Eaton Fuller® 9ALL
  - Eaton Fuller® 10 speed
  - Eaton Fuller® 13 speed
  - Eaton Fuller® 15 speed
  - Eaton Fuller® 18 speed
- Automated Manual
  - Eaton AutoShift® 10 speed
  - Eaton AutoShift® 18 speed
  - Eaton UltraShift® 10 speed
- Automatic
  - Allison® 3000 series
  - Allison® 4000 series

Standard Features

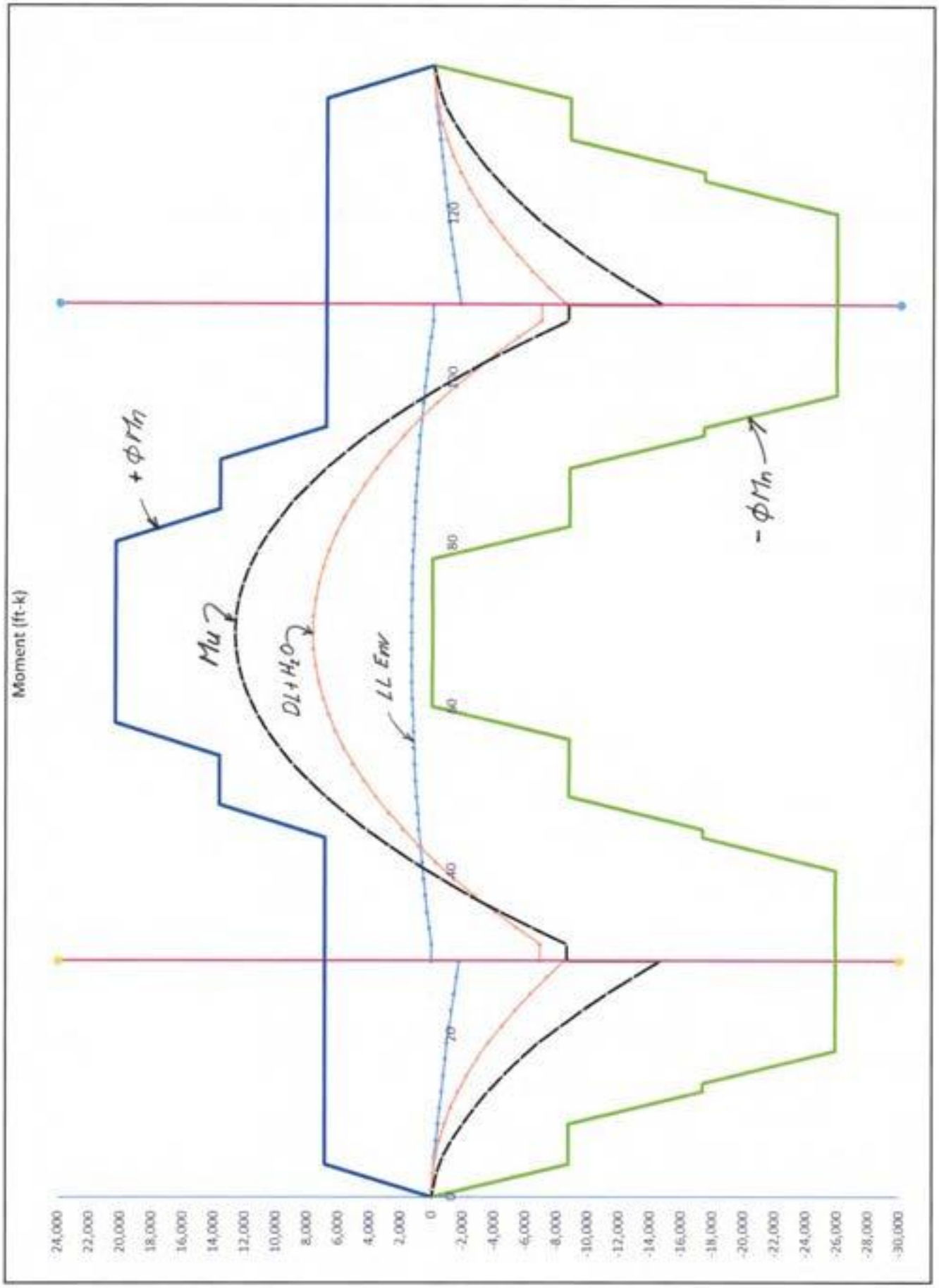
- 114" BBC steel-reinforced aluminum day cab
- DD13® engine (/demand-detroit/engines/dd13/)with 370 HP, 1250 lb-ft torque
- Allison 3000 Series transmission
- Front axle rated at 12,000 lbs
- Rear tandem axle rated at 40,000 lbs
- Up to 50-degree wheel cut depending on wheel equipment
- Set-forward front axle position at 31"
- 60-gallon cylindrical fuel tank
- Strong, durable cab and hood
- Radiator mounted molded-in color front grille with signature styling
- Front grille, headlight bezels, engine air intake grille, bumper and primary mirrors trimmed in black
- Halogen composite headlights
- Air rear cab mounts
- Ergonomic wing dash
- 63" x 14" rear tinted window
- 2,500 square inch windshield

Optional Features

- Bridge formula bumpers for 29.5" front axle position
- 48" set-back axle position
- Bright accented front grille with chromed grille surround, headlight bezels and engine air intake grille
- Engine Quick Fit service (/request-a-quote/)
- Integral front frame extensions in 12" and 24" lengths
- Large selection of wheelbases with frames and frame reinforcements to meet severe duty needs
- Front engine, rear engine and transmission power take-offs


Shear (kips)
1,600
1,400
1,200
1,000
800
600
400
200
0
-200
-400
-600
-800
-1,000
-1,200
-1,400
-1,600
20
40
60
80
100
120
ϕVn
Vu
DL+H2O
LL
Vu
DL+H2O
LL
LL
DL+H2O
Vu
DL+H2O
Vu
ϕVn

8 kips


Moment (ft-k)
+ φMn
Mu
DL + H2O
LL Env
- φMn
120
100
80
60
40
20
0
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
-2,000
-4,000
-6,000
-8,000
-10,000
-12,000
-14,000
-16,000
-18,000
-20,000
-22,000
-24,000
-26,000
-28,000
-30,000

w_{DL} = 20.2 k/ft

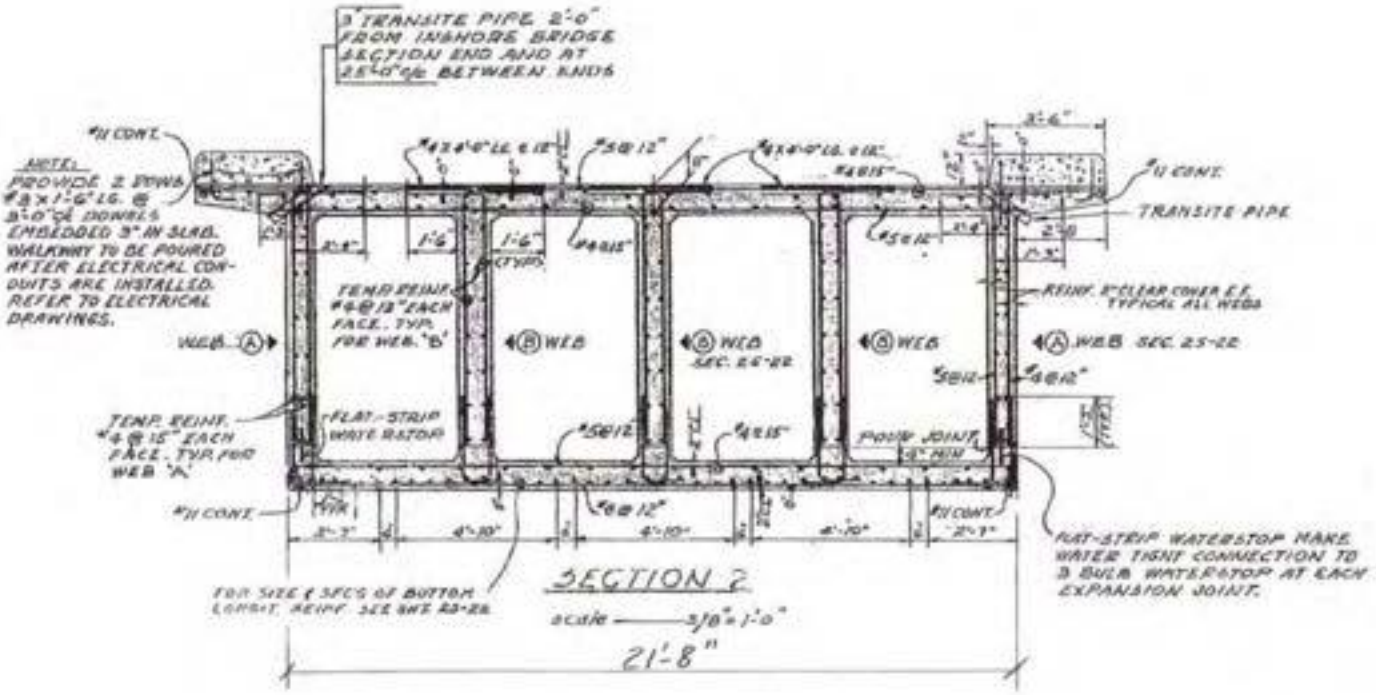
R_{DL} = 1,395.4 k

x ft	M_{LL} ft-k	M_{DL} ft-k	M_t ft-k	M_u ft-k	V_{LL} k	V_{DL} k	V_t k	V_u k
0	0.00	0.00	0.00	0.00	29.00	0.00	9.67	67.66
1	-29.00	-10.11	-9.67	-80.30	29.00	20.22	9.67	92.94
3	-87.00	-91.00	-29.00	-316.75	29.00	60.67	9.67	143.50
5	-174.00	-252.79	-57.99	-721.97	58.00	101.12	19.33	261.72
7	-290.00	-495.46	-96.66	-1,295.98	58.00	141.56	19.33	312.28
9	-406.00	-819.03	-135.32	-1,971.10	58.00	182.01	19.33	362.84
11	-522.00	-1,223.49	-173.98	-2,747.33	58.00	222.45	19.33	413.40
13	-638.00	-1,708.84	-212.65	-3,624.68	58.00	262.90	19.33	463.95
15	-754.00	-2,275.09	-251.31	-4,603.15	58.00	303.35	19.33	514.51
17	-870.00	-2,922.22	-289.97	-5,682.73	58.00	343.79	19.33	565.07
19	-986.00	-3,650.25	-328.63	-6,863.42	58.00	384.24	19.33	615.63
21	-1,129.00	-4,459.17	-376.30	-8,208.23	76.00	424.68	25.33	708.18
23	-1,281.00	-5,348.98	-426.96	-9,675.15	76.00	465.13	25.33	758.74
25	-1,433.00	-6,319.69	-477.62	-11,243.19	76.00	505.58	25.33	809.30
27	-1,585.00	-7,371.28	-528.28	-12,912.35	76.00	546.02	25.33	859.86
29	-1,737.00	-8,503.77	-578.94	-14,682.61	76.00	586.47	25.33	910.41
29.01	0.00	-8,503.77	0.00	-8,657.97	-68.26	-808.92	-22.75	-1,119.87
31	0.00	-6,926.38	0.00	-8,657.97	-68.26	-768.47	-22.75	-1,119.87
33	164.70	-5,429.88	54.89	-6,403.05	-68.26	-728.03	-22.75	-1,069.31
35	293.60	-4,014.27	97.86	-4,332.78	-68.26	-687.58	-22.75	-1,018.75
37	414.90	-2,679.55	138.29	-2,381.36	-66.64	-647.14	-22.21	-964.40
39	528.60	-1,425.72	176.18	-548.78	-64.46	-606.69	-21.49	-908.77
41	634.80	-252.79	211.58	1,165.18	-62.56	-566.24	-20.85	-853.78
43	733.30	839.25	244.41	2,760.06	-60.66	-525.80	-20.22	-798.79
45	824.20	1,850.40	274.71	4,236.09	-58.76	-485.35	-19.59	-743.80
47	907.50	2,780.66	302.47	5,593.28	-56.86	-444.91	-18.95	-688.81
49	983.30	3,630.03	327.73	6,831.84	-54.96	-404.46	-18.32	-633.82
51	1,051.40	4,398.50	350.43	7,951.33	-53.06	-364.01	-17.69	-578.83
53	1,111.90	5,086.08	370.60	8,951.97	-51.16	-323.57	-17.05	-523.84
55	1,164.80	5,692.77	388.23	9,833.77	-49.26	-283.12	-16.42	-468.85
57	1,210.20	6,218.57	403.36	10,596.95	-47.36	-242.68	-15.79	-413.86
59	1,247.90	6,663.48	415.93	11,241.04	-45.46	-202.23	-15.15	-358.87
61	1,278.00	7,027.49	425.96	11,766.29	-43.56	-161.78	-14.52	-303.87
63	1,300.54	7,310.61	433.47	12,172.79	-41.66	-121.34	-13.89	-248.88
65	1,315.50	7,512.84	438.46	12,460.48	-39.76	-80.89	-13.25	-193.89
67	1,322.80	7,634.18	440.89	12,629.18	-37.86	-40.45	-12.62	-138.90
69	1,322.50	7,674.63	440.79	12,679.04	35.96	0.00	11.99	83.91
71	1,322.80	7,634.18	440.89	12,629.18	37.86	40.45	12.62	138.90
73	1,315.50	7,512.84	438.46	12,460.48	39.76	80.89	13.25	193.89
75	1,300.54	7,310.61	433.47	12,172.79	41.66	121.34	13.89	248.88
77	1,278.00	7,027.49	425.96	11,766.29	43.56	161.78	14.52	303.87
79	1,247.90	6,663.48	415.93	11,241.04	45.46	202.23	15.15	358.87
81	1,210.20	6,218.57	403.36	10,596.95	47.36	242.68	15.79	413.86
83	1,164.80	5,692.77	388.23	9,833.77	49.26	283.12	16.42	468.85
85	1,111.90	5,086.08	370.60	8,951.97	51.16	323.57	17.05	523.84
87	1,051.40	4,398.50	350.43	7,951.33	53.06	364.01	17.69	578.83
89	983.30	3,630.03	327.73	6,831.84	54.96	404.46	18.32	633.82
91	907.50	2,780.66	302.47	5,593.28	56.86	444.91	18.95	688.81
93	824.20	1,850.40	274.71	4,236.09	58.76	485.35	19.59	743.80
95	733.30	839.25	244.41	2,760.06	60.66	525.80	20.22	798.79
97	634.80	-252.79	211.58	1,165.18	62.56	566.24	20.85	853.78
99	528.60	-1,425.72	176.18	-548.78	64.46	606.69	21.49	908.77
101	414.90	-2,679.55	138.29	-2,381.36	66.64	647.14	22.21	964.40
103	293.60	-4,014.27	97.86	-4,332.78	68.26	687.58	22.75	1,018.75
105	164.70	-5,429.88	54.89	-6,403.05	68.26	728.03	22.75	1,069.31
107	0.00	-6,926.38	0.00	-8,657.97	68.26	768.47	22.75	1,119.87
108.99	0.00	-8,503.77	0.00	-10,629.71	68.26	808.92	22.75	1,119.87
109	-1,737.00	-8,503.77	-578.94	-14,682.61	-76.00	-586.47	-25.33	-910.41
111	-1,585.00	-7,371.28	-528.28	-12,912.35	-76.00	-546.02	-25.33	-859.86
113	-1,433.00	-6,319.69	-477.62	-11,243.19	-76.00	-505.58	-25.33	-809.30
115	-1,281.00	-5,348.98	-426.96	-9,675.15	-76.00	-465.13	-25.33	-758.74
117	-1,129.00	-4,459.17	-376.30	-8,208.23	-76.00	-424.68	-25.33	-708.18
119	-986.00	-3,650.25	-328.63	-6,863.42	-58.00	-384.24	-19.33	-615.63
121	-870.00	-2,922.22	-289.97	-5,682.73	-58.00	-343.79	-19.33	-565.07
123	-754.00	-2,275.09	-251.31	-4,603.15	-58.00	-303.35	-19.33	-514.51
125	-638.00	-1,708.84	-212.65	-3,624.68	-58.00	-262.90	-19.33	-463.95
127	-522.00	-1,223.49	-173.98	-2,747.33	-58.00	-222.45	-19.33	-413.40
129	-406.00	-819.03	-135.32	-1,971.10	-58.00	-182.01	-19.33	-362.84
131	-290.00	-495.46	-96.66	-1,295.98	-58.00	-141.56	-19.33	-312.28
133	-174.00	-252.79	-57.99	-721.97	-58.00	-101.12	-19.33	-261.72
135	-87.00	-91.00	-29.00	-316.75	-29.00	-60.67	-9.67	-143.50
137	-29.00	-10.11	-9.67	-80.30	-29.00	-20.22	-9.67	-92.94
138	0.00	0.00	0.00	0.00	-29.00	0.00	-9.67	-67.66

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 11 of
REVISION No.

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

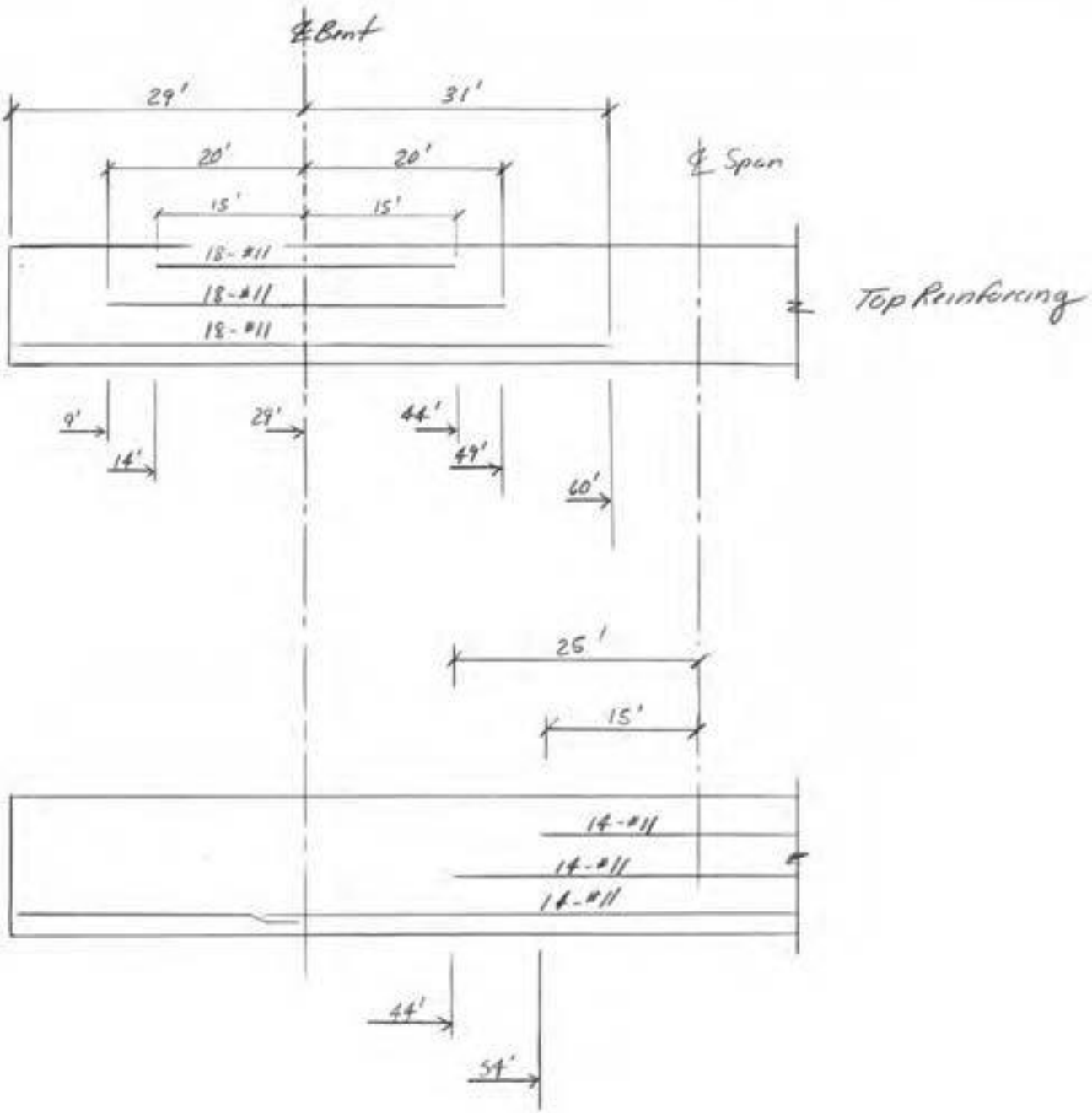


Component	t ft	w or h ft	Quan	Area ft^2	γ kcf	Weight k/ft
Top Slab	0.92	21.67	1	19.86	0.150 Conc	2.980
Bot Slab	0.83	21.67	1	18.06	0.150 Conc	2.709
Web A	0.83	7.33	2	12.22	0.150 Conc	1.833
Web B	1.00	7.33	3	22.00	0.150 Conc	3.300
Overhang	0.67	2.67	2	3.56	0.150 Conc	0.533
Fillets	0.17	0.08	16	0.22	0.150 Conc	0.033
Curb	1.00	3.50	2	7.00	0.150 Conc	1.050
H_2O in Cells	4.25	7.33	4	124.67	0.062 H2O	7.779
Railing	-	-	-	-		0.015
				Total		20.233 klf

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 12 of
REVISION No.

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE



WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Moment Capacity (Top Reinf)

$b = 21.67' = 260"$
$d = (9)(12) - 2.7" = 105.3" \Rightarrow$ Use 105"
$f_c' = 3{,}000$ psi
$f_y = 40{,}000$ psi

18-#11 : $M_u = 8{,}774$ ft-k
36-#11 : $M_u = 17{,}405$ ft-k
54-#11 : $M_u = 25{,}893$ ft-k

Moment Capacity (Bott Reinf)

$b = (27')(12) = 324"$
$d = 105"$
$f_c' = 3{,}000$ psi
$f_y = 40{,}000$ psi

14-#11 : $M_u = 6{,}845$ ft-k
28-#11 : $M_u = 13{,}621$ ft-k
42-#11 : $M_u = 20{,}327$ ft-k

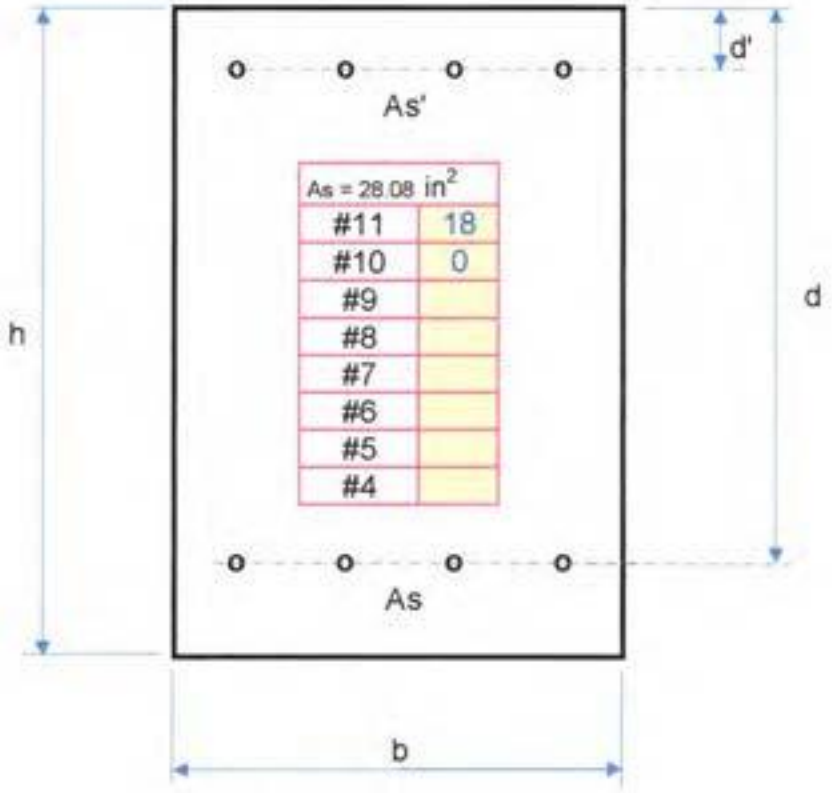
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d =	105.00	in.				
d' =	1.5	in.				
As' =	0	sq in	e(s)'=	0.0007	>	0.0014
b =	260.00	in.	rho =	0.0010	<	0.0278
fy =	40,000	psi				
fc' =	3,000	psi				
phi =	0.9					
beta(1) =	0.85					
rho' =	0.0000					
rho(max) =	0.0278					
rho =	0.0010					
As(dsgn.)	28.08	sq in	Mu =	8,773,844	ft-lbs	



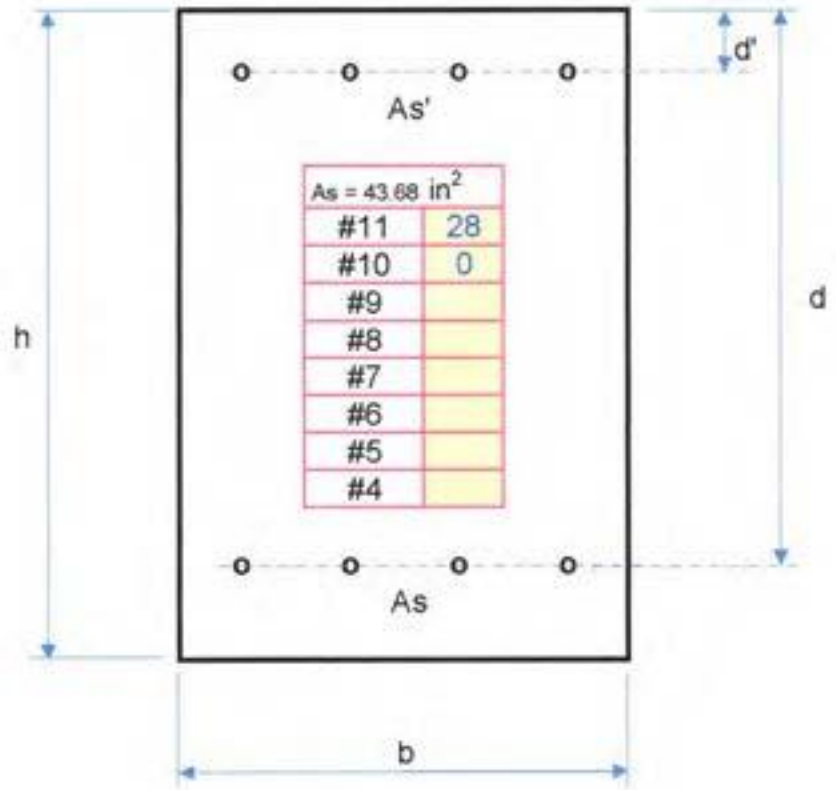
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 15 of
REVISION No.

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d =	105.00	in.				
d' =	1.5	in.				
As' =	0	sq in	e(s)'=	0.0012	>	0.0014
b =	324.00	in.	rho =	0.0013	<	0.0278
fy =	40,000	psi				
fc' =	3,000	psi				
phi =	0.9					
beta(1) =	0.85					
rho' =	0.0000					
rho(max) =	0.0278					
rho =	0.0013					
As(dsgn.)	43.68	sq in	Mu =	13,620,642	ft-lbs	



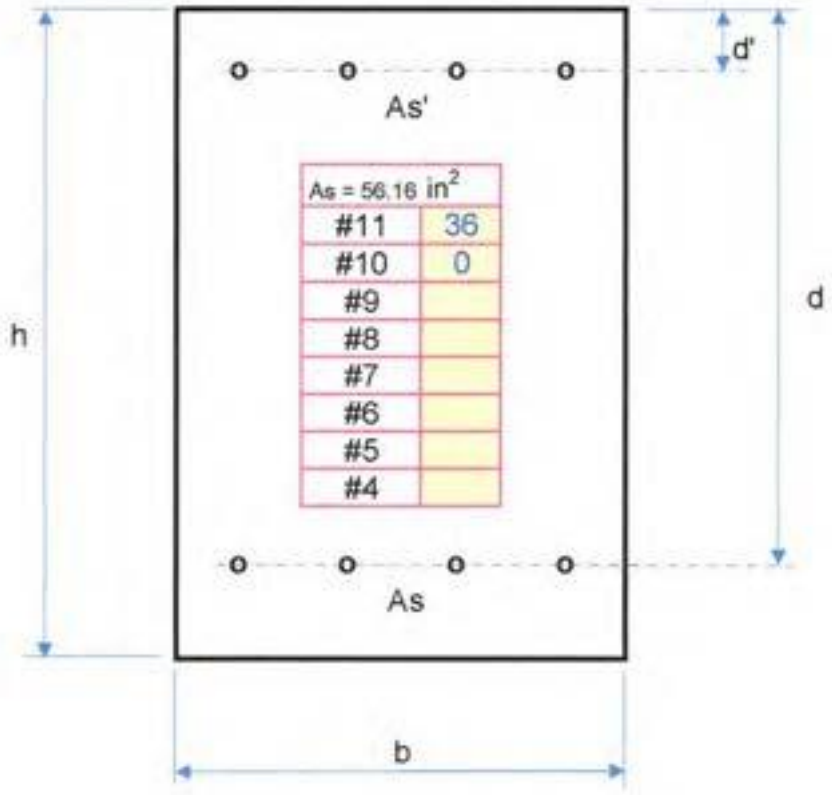
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d =	105.00	in.				
d' =	1.5	in.				
As' =	0	sq in	e(s)'=	0.0019	>	0.0014
b =	260.00	in.	rho =	0.0021	<	0.0278
fy =	40,000	psi				
fc' =	3,000	psi				
phi =	0.9					
beta(1) =	0.85					
rho' =	0.0000					
rho(max) =	0.0278					
rho =	0.0021					
As(dsgn.)	56.16	sq in	Mu =	17,404,975	ft-lbs	



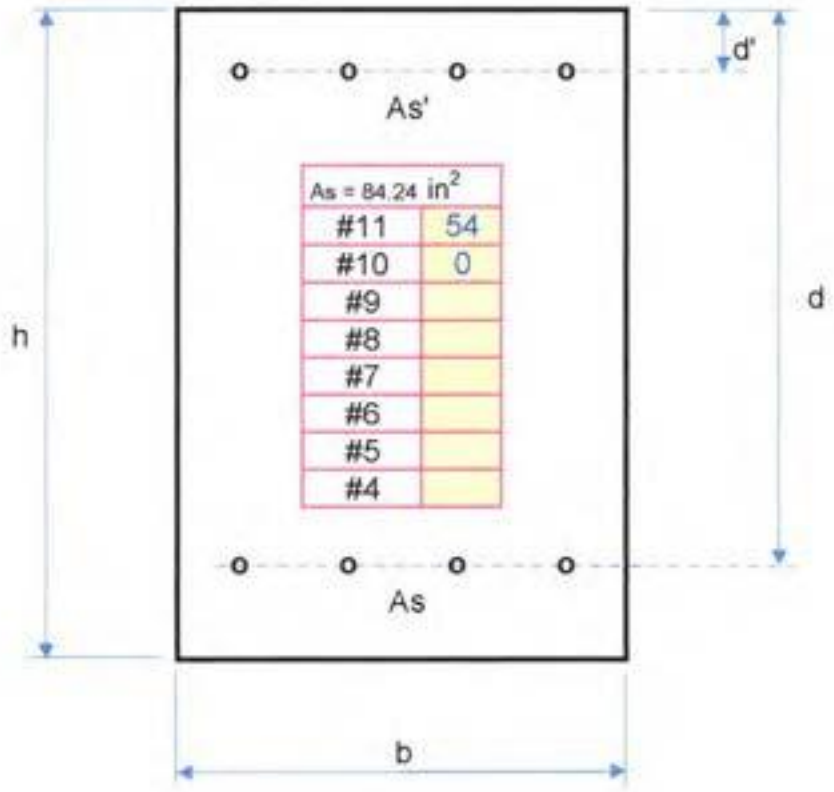
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d	=	105.00	in.				
d'	=	1.5	in.				
As'	=	0	sq in	e(s)'=	0.0022	>	0.0014
b	=	260.00	in.	rho =	0.0031	<	0.0278
fy	=	40,000	psi				
fc'	=	3,000	psi				
phi	=	0.9					
beta(1)	=	0.85					
rho'	=	0.0000					
rho(max)	=	0.0278					
rho	=	0.0031					
As(dsgn.)		84.24	sq in	Mu =	25,893,394	ft-lbs	

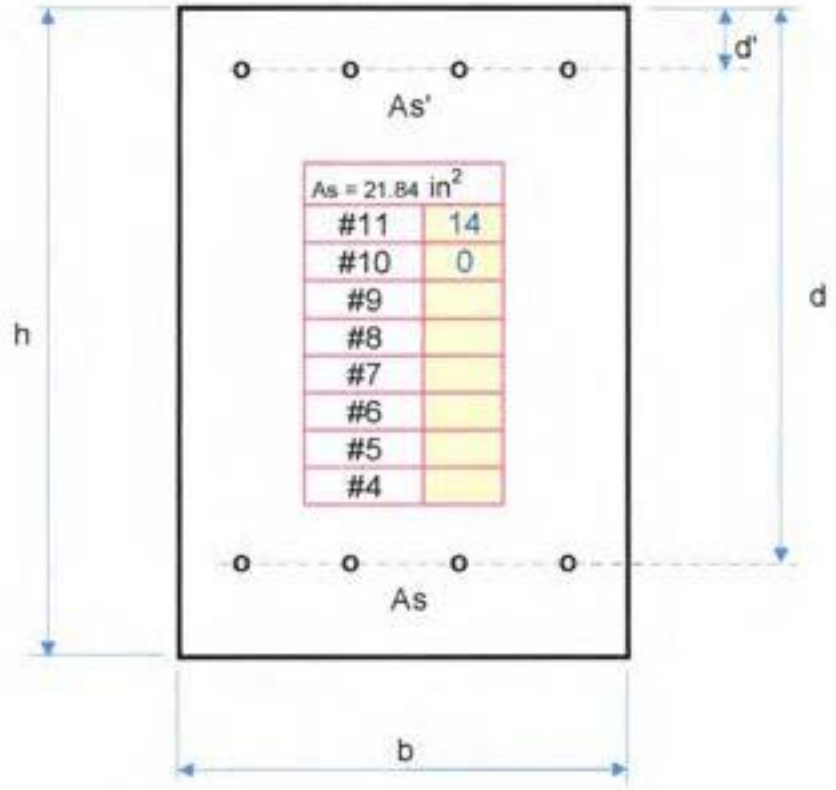


WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d =	105.00	in.				
d' =	1.5	in.				
As' =	0	sq in	e(s)'=	-0.0006	>	0.0014
b =	324.00	in.	rho =	0.0006	<	0.0278
fy =	40,000	psi				
fc' =	3,000	psi				
phi =	0.9					
beta(1) =	0.85					
rho' =	0.0000					
rho(max) =	0.0278					
rho =	0.0006					
As(dsgn.)	21.84	sq in	Mu =	6,844,961	ft-lbs	



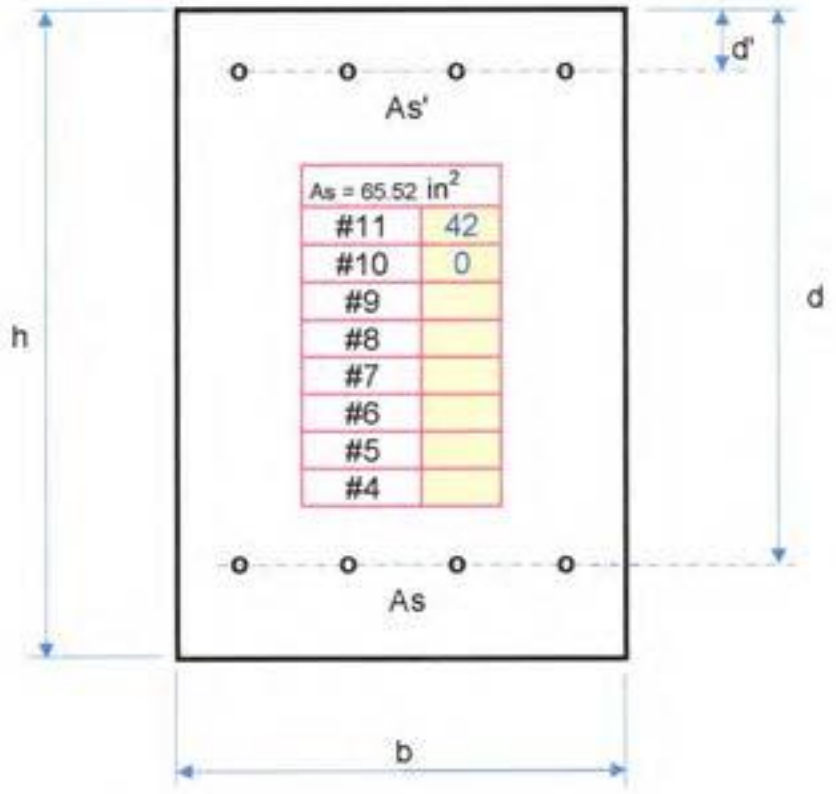
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d	=	105.00	in.				
d'	=	1.5	in.				
As'	=	0	sq in	e(s)'=	0.0018	>	0.0014
b	=	324.00	in.	rho =	0.0019	<	0.0278
fy	=	40,000	psi				
fc'	=	3,000	psi				
phi	=	0.9					
beta(1)	=	0.85					
rho'	=	0.0000					
rho(max)	=	0.0278					
rho	=	0.0019					
As(dsgn.)		65.52	sq in	Mu =	20,327,045	ft-lbs	



WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Shear Capacity

$b = 2(10) + (3)(12) = 56"$

$d = 105"$

$f_y = 40{,}000$ psi

$f_c' = 3{,}000$ psi

Stirrups: (5 webs)(2 legs) = 10 legs

Spacing: $S_{max} = 12"$

$\phi V_c = 579^k$ } 1,555 K

$\phi V_s = 976^k$ }

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 21 of
REVISION No.

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Shear Strength Beam Design:

d =	105.00	in.	Depth of beam
b =	56.00	in.	Width of beam
f_y =	40,000	psi	Rebar yield stress
f_c' =	3,000	psi	Concrete strength
ϕ =	0.9		Reduction factor
S =	12	in	Stirrup / Tie Spacing

ϕV_n lbs	ϕV_c lbs	ϕV_s lbs	Rebar	S_{max}
642,710	579,710	63,000	1 - #4	9.6 in
705,710	579,710	126,000	2 - #4	9.6 in
768,710	579,710	189,000	3 - #4	9.6 in
831,710	579,710	252,000	4 - #4	9.6 in
894,710	579,710	315,000	5 - #4	9.6 in
957,710	579,710	378,000	6 - #4	9.6 in
677,360	579,710	97,650	1 - #5	14.9 in
775,010	579,710	195,300	2 - #5	14.9 in
970,310	579,710	390,600	4 - #5	14.9 in
1,165,610	579,710	585,900	6 - #5	14.9 in
1,360,910	579,710	781,200	8 - #5	14.9 in
1,556,210	579,710	976,500	10 - #5	14.9 in
718,310	579,710	138,600	1 - #6	21.1 in
856,910	579,710	277,200	2 - #6	21.1 in
995,510	579,710	415,800	3 - #6	21.1 in
1,134,110	579,710	554,400	4 - #6	21.1 in
1,272,710	579,710	693,000	5 - #6	21.1 in
1,411,310	579,710	831,600	6 - #6	21.1 in
768,710	579,710	189,000	1 - #7	28.8 in
957,710	579,710	378,000	2 - #7	28.8 in
1,146,710	579,710	567,000	3 - #7	28.8 in
1,335,710	579,710	756,000	4 - #7	28.8 in
1,524,710	579,710	945,000	5 - #7	28.8 in
1,713,710	579,710	1,134,000	6 - #7	28.8 in
828,560	579,710	248,850	1 - #8	37.9 in
1,077,410	579,710	497,700	2 - #8	37.9 in
1,326,260	579,710	746,550	3 - #8	37.9 in
1,575,110	579,710	995,400	4 - #8	37.9 in
1,823,960	579,710	1,244,250	5 - #8	37.9 in
2,072,810	579,710	1,493,100	6 - #8	37.9 in

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95815 Fax 916.341.7767

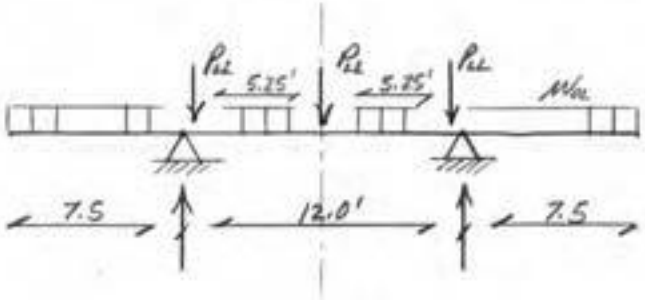
JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Bent Cap

$DL_{BC} = (4.5)(5.0)(0.15) = 3.38^k/ft$

$DL_{BG} = R_{DL} = 1395.4^k/27' = 51.68^k/ft$ (Box Girder)

$LL = 76^k$ applied on center web $\Rightarrow 25.4^k/web$



$w_{DL} = (51.68 + 3.38) = 55.06^k/ft$

$P_{LL\pm} = (25.4)(1.33) = 33.8^k$

$M_{DL} = -(55.06)(7.5)^2/2 = -1,549$ ft-k (Support) 991 ft-k (Support Face)

$M_{DL} = (55.06)(12)^2/8 - 1549 = -558$ ft-k (Mid-Span)

$M_{LL\pm} = \{3(33.8)/2\}(6) - (33.8)(5.25) = 127$ ft-k (Mid-Span)

@ Support $M_u = 1.25(-1549) = -1,936$ ft-k (1,239 ft-k Support Face)

@ Mid-Span $M_u = 1.25(-558) + 1.75(127) = -475$ ft-k

$V_u = 1.25(55.06)(7.5) = 516$ kips

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Bent Cap (Continued)

$d = 60 - 2 = 58''$

$b = 54''$

$A_s = 4\text{-}\#14 + 2\text{-}\#18 + 2\text{-}\#11 \Rightarrow$ Try $8\text{-}\#11$

$\phi M_n = 2{,}103$ ft-k $> M_u$ Conservative $\Rightarrow$ Ok

Shear: $\left.\begin{array}{l} \#5 \times 4 \text{ Legs} \\ S_{max} = 6'' \end{array}\right\} \Rightarrow \phi V_n = 740^{k} > V_u$ Ok

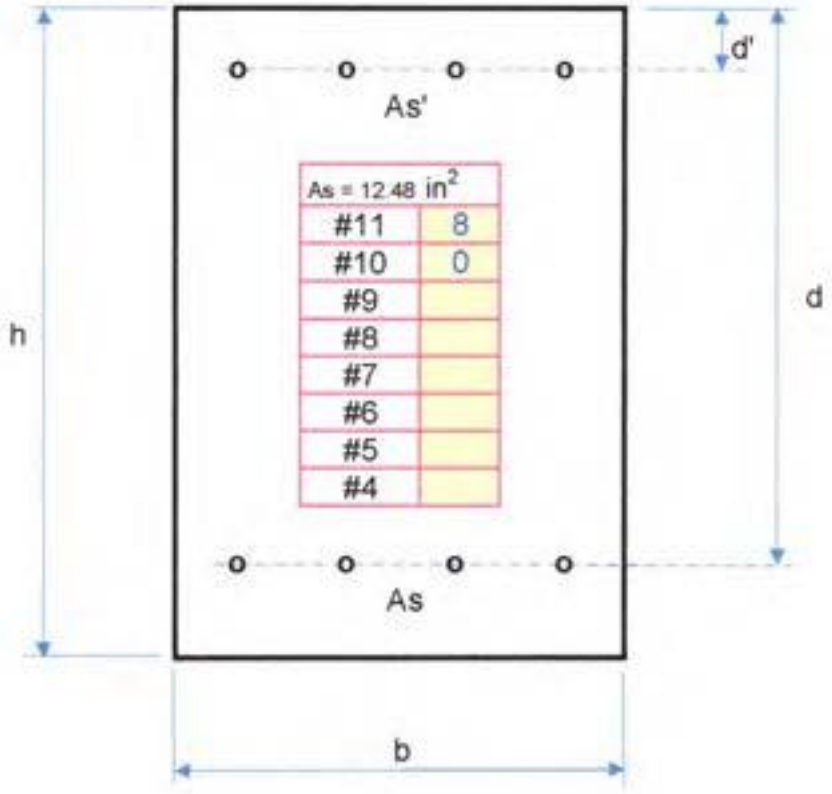
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Strength Beam Design:

d	=	58.00	in.				
d'	=	1.5	in.				
As'	=	0	sq in	e(s)'=	0.0019	>	0.0014
b	=	54.00	in.	rho =	0.0040	<	0.0278
fy	=	40,000	psi				
fc'	=	3,000	psi				
phi	=	0.9					
beta(1)	=	0.85					
rho'	=	0.0000					
rho(max)	=	0.0278					
rho	=	0.0040					
As(dsgn.)		12.48	sq in	Mu =	2,103,655	ft-lbs	



WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 25 of
REVISION No.

JOB No. 8640 JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Secramento SUBJECT Structural Evaluation CHK'D DATE

Ultimate Shear Strength Beam Design:

d =	58.00	in.	Depth of beam
b =	54.00	in.	Width of beam
f_y =	40,000	psi	Rebar yield stress
f_c' =	3,000	psi	Concrete strength
ϕ =	0.9		Reduction factor
S =	6	in	Stirrup / Tie Spacing

ϕV_n lbs	ϕV_c lbs	ϕV_s lbs	Rebar	S_{max}
378,384	308,784	69,600	1 - #4	9.6 in
447,984	308,784	139,200	2 - #4	9.6 in
517,584	308,784	208,800	3 - #4	9.6 in
587,184	308,784	278,400	4 - #4	9.6 in
656,784	308,784	348,000	5 - #4	9.6 in
726,384	308,784	417,600	6 - #4	9.6 in
416,664	308,784	107,880	1 - #5	14.9 in
524,544	308,784	215,760	2 - #5	14.9 in
740,304	308,784	431,520	4 - #5	14.9 in
956,064	308,784	647,280	6 - #5	14.9 in
1,171,824	308,784	863,040	8 - #5	14.9 in
1,387,584	308,784	1,078,800	10 - #5	14.9 in
461,904	308,784	153,120	1 - #6	21.1 in
615,024	308,784	306,240	2 - #6	21.1 in
768,144	308,784	459,360	3 - #6	21.1 in
921,264	308,784	612,480	4 - #6	21.1 in
1,074,384	308,784	765,600	5 - #6	21.1 in
1,227,504	308,784	918,720	6 - #6	21.1 in
517,584	308,784	208,800	1 - #7	28.8 in
726,384	308,784	417,600	2 - #7	28.8 in
935,184	308,784	626,400	3 - #7	28.8 in
1,143,984	308,784	835,200	4 - #7	28.8 in
1,352,784	308,784	1,044,000	5 - #7	28.8 in
1,561,584	308,784	1,252,800	6 - #7	28.8 in
583,704	308,784	274,920	1 - #8	37.9 in
858,624	308,784	549,840	2 - #8	37.9 in
1,133,544	308,784	824,760	3 - #8	37.9 in
1,408,464	308,784	1,099,680	4 - #8	37.9 in
1,683,384	308,784	1,374,600	5 - #8	37.9 in
1,958,304	308,784	1,649,520	6 - #8	37.9 in

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Column

$DL_{Box} = 1395.4/2 = 700^k$
$DL_{BC} = (55.06)(27)/2 = 743^k$
} $DL = 1,443^k$

$LL + I = (76)(1.333) = 101^k$

$M_{DL} = 5\%\ M\ (Box\ Girder) = 0.05\ (8504) = 425\ ft\text{-}k$ (388 ft-k Per Model Ck)

$M_{LL+I} = 5\%\ M\ (Box\ Girder) = 0.05\ (1737 + 577) = 116\ ft\text{-}k$

44"Φ
10-#11
2" Clr
#4 x 3" Spiral
Length = 43'
K = 0.8 (Pinned/Fixed)

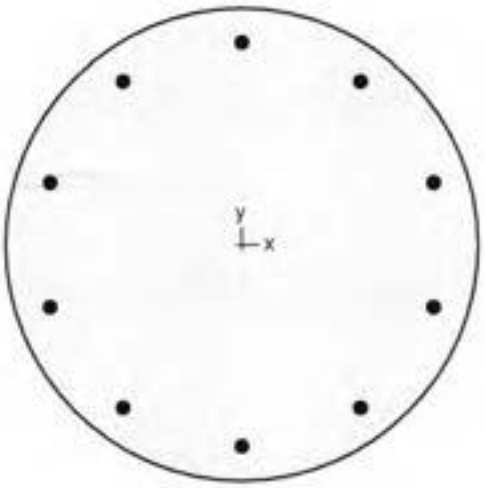
∴ OK ⇒ See SP Column Results on following Page

Sht 27

M33=387.96[Kip*ft]
M33=387.96[Kip*ft]
M33=-8507.96[Kip*ft]
M33=-9283.93[Kip*ft]
M33=-191.41[Kip*ft]
M33=-191.41[Kip*ft]
M33=-8507.96[Kip*ft]
M33=-9720.84[Kip*ft]
Y
X
Z

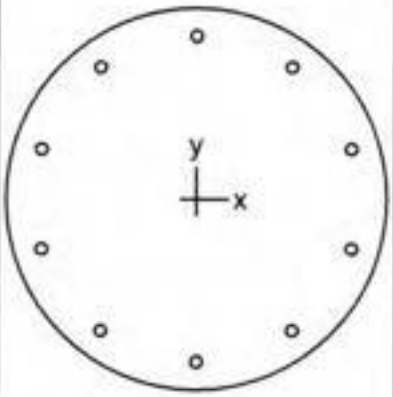
spColumn

spColumn v6.50
Computer program for the Strength Design of Reinforced Concrete Sections
Copyright - 1988-2020, STRUCTUREPOINT, LLC.
All rights reserved



Licensee stated below acknowledges that STRUCTUREPOINT (SP) is not and cannot be responsible for either the accuracy or adequacy of the material supplied as input for processing by the spColumn computer program. Furthermore, STRUCTUREPOINT neither makes any warranty expressed nor implied with respect to the correctness of the output prepared by the spColumn program. Although STRUCTUREPOINT has endeavored to produce spColumn error free the program is not and cannot be certified infallible. The final and only responsibility for analysis, design and engineering documents is the licensee's. Accordingly, STRUCTUREPOINT disclaims all responsibility in contract, negligence or other tort for any analysis, design or engineering documents prepared in connection with the use of the spColumn program. Licensed to: Wood Rodgers. License ID: 70305-1067587-4-23DA0-21C48

Sht 29



44 in diam.

Code: ACI 318-14

Units: English

Run axis: About X-axis

Run option: Investigation

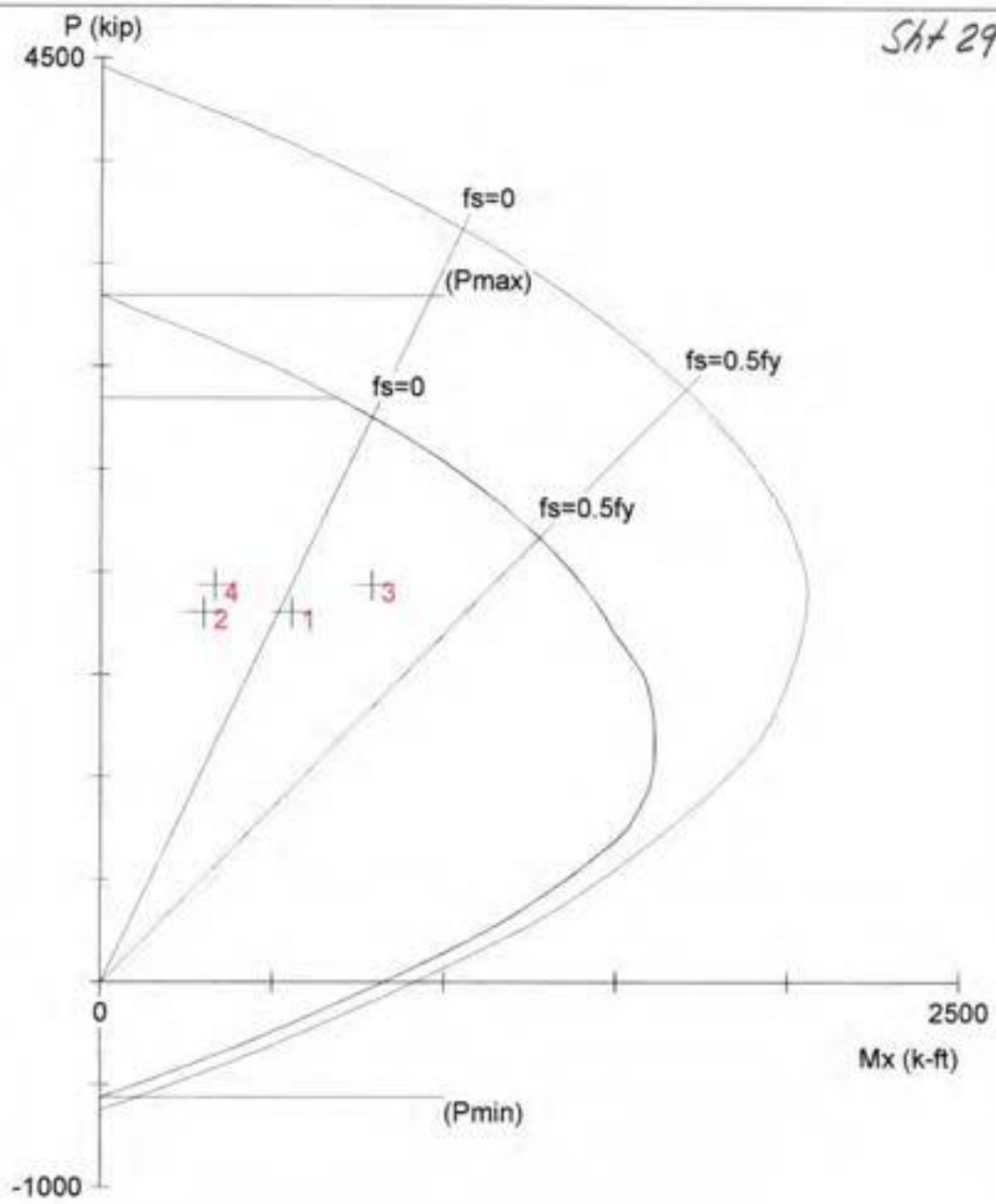
Slenderness: Considered

Column type: Structural

Bars: ASTM A615

Date: 09/02/20

Time: 17:52:41



STRUCTUREPOINT - spColumn v6.50 (TM). Licensed to: Wood Rodgers. License ID: 70305-1067587-4-23DA0-21C48

File: d:\users\gmurdock\desktop\fwtp pdfs\44in dia.col

Project: FWTP Intake Bridge

Column: 44" Ø

Engineer: GDM

f'c = 3 ksi	fy = 40 ksi	Ag = 1520.53 in^2	10 #11 bars
Ec = 3122 ksi	Es = 29000 ksi	As = 15.60 in^2	rho = 1.03%
fc = 2.55 ksi	e_yt = 0.00137931 in/in	Xo = 0.00 in	Ix = 183984 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 183984 in^4
Beta1 = 0.85		Min clear spacing = 10.21 in	Clear cover = 2.50 in
Confinement: Spiral		kx(nonsway) = 0.8	kx(sway) = N/A

phi(a) = 0.85, phi(b) = 0.9, phi(c) = 0.75

Sht 30

Contents

1. General Information 3
2. Material Properties 3
2.1. Concrete 3
2.2. Steel 3
3. Section 3
3.1. Shape and Properties 3
3.2. Section Figure 4
4. Reinforcement 4
4.1. Bar Set: ASTM A615 4
4.2. Confinement and Factors 4
4.3. Arrangement 4
5. Loading 5
5.1. Load Combinations 5
5.2. Service Loads 5
5.3. Sustained Load Factors 5
6. Slenderness 5
6.1. Sway Criteria 5
6.2. Columns 5
6.3. X - Beams 5
7. Moment Magnification 5
7.1. General Parameters 5
7.2. Effective Length Factors 6
7.3. Magnification Factors: X - axis 6
8. Factored Moments 6
8.1. X - axis 6
9. Factored Loads and Moments with Corresponding Capacity Ratios 6
10. Diagrams 7
10.1. PM at θ=0 [deg] 7

List of Figures

Figure 1: Column section 4

1. General Information

File Name	untitled.col
Project	FWTP Intake Bridge
Column	44" Ø
Engineer	GDM
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Considered
Column Type	Structural
Capacity Method	Moment capacity

2. Material Properties

2.1. Concrete

Type	Standard	
f'_c	3	ksi
E_c	3122.02	ksi
f_r	2.55	ksi
ε_u	0.003	in/in
β_1	0.85	

2.2. Steel

Type	Standard	
f_y	40	ksi
E_s	29000	ksi
ε_y	0.00137931	in/in

3. Section

3.1. Shape and Properties

Type	Circular	
Diameter	44	in
A_g	1520.53	in^2
I_x	183984	in^4
I_y	183984	in^4
r_x	11	in
r_y	11	in
X_o	0	in
Y_o	0	in

Sht 32

3.2. Section Figure

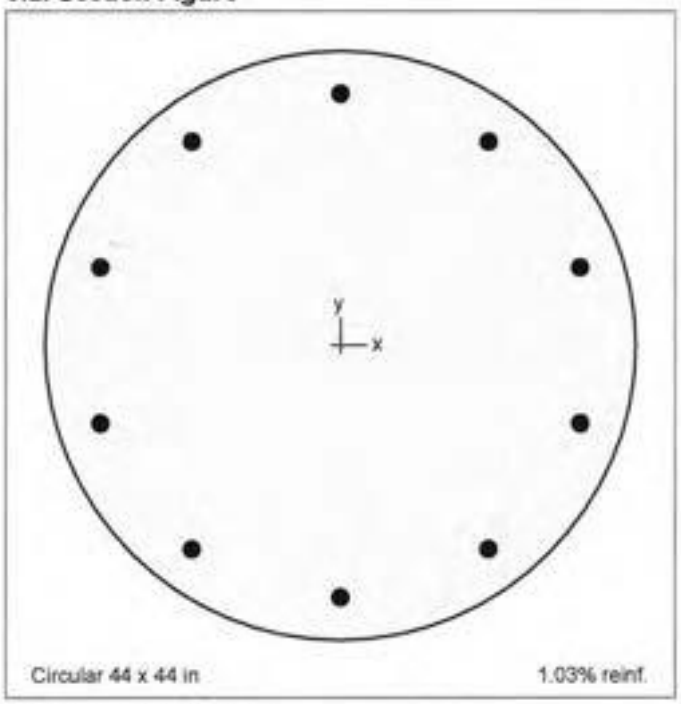


Figure 1: Column section

4. Reinforcement

4.1. Bar Set: ASTM A615

Bar	Diameter	Area	Bar	Diameter	Area	Bar	Diameter	Area
	in	in²		in	in²		in	in²
#3	0.38	0.11	#4	0.50	0.20	#5	0.63	0.31
#6	0.75	0.44	#7	0.88	0.60	#8	1.00	0.79
#9	1.13	1.00	#10	1.27	1.27	#11	1.41	1.56
#14	1.69	2.25	#18	2.26	4.00			

4.2. Confinement and Factors

Confinement type	Spiral
For #10 bars or less	#4 ties
For larger bars	#4 ties
Capacity Reduction Factors	
Axial compression, (a)	0.85
Tension controlled ϕ, (b)	0.9
Compression controlled ϕ, (c)	0.75

4.3. Arrangement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	2 in
Bars	10 #11

Total steel area, A_s	15.60	in²
Rho	1.03	%
Minimum clear spacing	10.21	in

5. Loading

5.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.250	0.000	0.000	0.000	0.000
U2	1.250	1.750	0.000	0.000	0.000

5.2. Service Loads

No.	Load Case	Axial Load	Mx @ Top	Mx @ Bottom	My @ Top	My @ Bottom
		kip	k-ft	k-ft	k-ft	k-ft
1	Dead	1443.00	425.00	0.00	0.00	0.00
1	Live	76.00	116.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	0.00	0.00	0.00	0.00	0.00
1	Snow	0.00	0.00	0.00	0.00	0.00

5.3. Sustained Load Factors

Load Case	Factor
	%
Dead	100
Live	0
Wind	0
EQ	0
Snow	0

6. Slenderness

6.1. Sway Criteria

X-Axis	Non-sway column

6.2. Columns

Column	Axis	Height	Width	Depth	I	f'_c	E_c
		ft	in	in	in⁴	ksi	ksi
Design	X	43	44	0	183984	3	3122.02
Above	X	48	0	0	183984	3	3122.02
Below	X	(no column specified...)					

6.3. X - Beams

Beam	Length	Width	Depth	I	f'_c	E_c
	ft	in	in	in⁴	ksi	ksi
Above Left	(no beam specified...)					
Above Right	(no beam specified...)					
Below Left	(no beam specified...)					
Below Right	(no beam specified...)					

7. Moment Magnification

7.1. General Parameters

Factors	User-defined

Stiffness reduction factor, ϕ_K	0.75
Cracked section coefficients, ci(beams)	0.35
Cracked section coefficients, ci(columns)	0.7
$0.2 E_c I_g + E_s I_{se}$ (X-axis)	1.95e+008 kip-in^2
Minimum eccentricity, $e_{x,min}$	1.92 in

7.2. Effective Length Factors

Axis	Ψ_{top}	Ψ_{bottom}	k (Nonsway)	k (Sway)	kl_u/r
X	0.000	0.000	0.800	(N/A)	37.53

7.3. Magnification Factors: X - axis

Load Combo		At Ends					Along Length					
		$\sum P_u$ kip	P_c kip	$\sum P_c$ kip	β_{dx}	δ_s	P_u kip	$k'l_u/r$	P_c kip	β_{dns}	C_m	δ
1	U1	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	1803.75	(N/A)	5640.90	1.000	0.600	1.046
1	U2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	1936.75	(N/A)	5841.47	0.931	0.600	1.075

8. Factored Moments

NOTE: Each loading combination includes the following cases:
Top - At column top
Bot - At column bottom

8.1. X - axis

Load Combo			1st Order				2nd Order			Ratio
			M_{2s} k-ft	M_{ns} k-ft	M_u k-ft	M_{2min} k-ft		M_2 k-ft	M_c k-ft	$2^{nd}/1^{st}$
1	U1	Top	531.25	(N/A)	531.25	288.60	M_2=	531.25	555.65	1.046
1	U1	Bot	0.00	(N/A)	0.00	288.60	M_1=	0.00	301.86	1.046
1	U2	Top	734.25	(N/A)	734.25	309.88	M_2=	734.25	789.61	1.075
1	U2	Bot	0.00	(N/A)	0.00	309.88	M_1=	0.00	333.25	1.075

9. Factored Loads and Moments with Corresponding Capacity Ratios

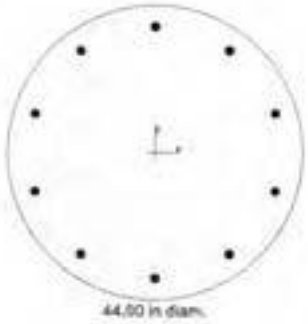
NOTE: Calculations are based on "Moment Capacity" Method.
Each loading combination includes the following cases:
Top - At column top
Bot - At column bottom

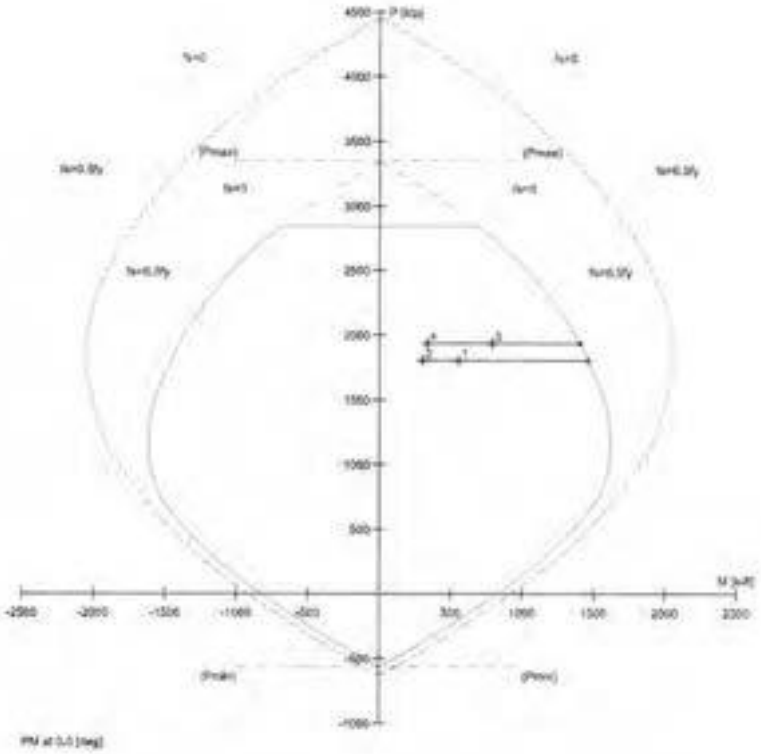
No.	Load Combo			Demand		Capacity		Parameters at Capacity			Capacity Ratio
				P_u kip	M_{ux} k-ft	ϕP_n kip	ϕM_{nx} k-ft	NA Depth in	ε_t	ϕ	
1	1	U1	Top	1803.75	555.65	1803.75	1459.94	29.03	0.00122	0.750	0.38
2	1	U1	Bot	1803.75	301.86	1803.75	1459.94	29.03	0.00122	0.750	0.21
3	1	U2	Top	1936.75	789.61	1936.75	1403.46	30.46	0.00102	0.750	0.56
4	1	U2	Bot	1936.75	333.25	1936.75	1403.46	30.46	0.00102	0.750	0.24

STRUCTUREPOINT - spColumn v8.10
Licensed to: Wood Rodgers | License ID: 71985-1057597-4-23DAD-21560
untitled.col

10. Diagrams

10.1. PM at θ=0 [deg]





General Information

Project	FWTP Intake Bridge
Column	44" Ø
Engineer	GDM
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Considered
Column Type	Structural
Capacity Method	Moment capacity

Materials

f'_c	3 ksi
E_c	3122.02 ksi
f_y	40 ksi
E_s	29000 ksi

Section

Type	Circular
Diameter	44 in
A_g	1520.53 in²
I_x	183984 in⁴
I_y	183984 in⁴

Reinforcement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	2 in
Bars	10 #11
Confinement type	Spiral
Total steel area, A_s	15.60 in²
Rho	1.03 %
Min. clear spacing	10.21 in

No.	Load Combo			P_u kip	M_{ux} k-ft	ϕP_n kip	ϕM_{nx} k-ft	Capacity Ratio
3	1	U2	Top	1936.8	789.6	1936.75	1403.46	0.56
1	1	U1	Top	1803.8	555.7	1803.75	1459.94	0.38
4	1	U2	Bot	1936.8	333.2	1936.75	1403.46	0.24
2	1	U1	Bot	1803.8	301.9	1803.75	1459.94	0.21

Max. Capacity Ratio: 0.56

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020

CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Footing / Foundation

$DL_{DCK} = 700^k \times 2 = 1,400^k$

$DL_{BC} = 743^k \times 2 = 1,486^k$

$DL_{col} = 2\{1520.53/144)(0.15)(43)\} = 136^k$

$DL_{wall} = (12 - 3.67)(10/12)(43)(0.15) = 45^k$

$DL = 3,067^k$

$LL = 76^k$ (2.5% of DL)

∴ OK by comparison

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg 100B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

PAGE No.
SHEET No. 37 of
REVISION No.

JOB No. 8640.___ JOB NAME FWTP Intake Bridge BY GDM DATE 09/2020
CLIENT City of Sacramento SUBJECT Structural Evaluation CHK'D DATE

Deck

$t = 11"$

Both Reinf : #5 @ 12"

Top Reinf : #5 @ 12

Added Top Reinf : #4 x 4'-0" @ 12" above Web

$d = 11 - 2.5 = 8.5"$

Span = Center to Center Spacing of Webs
= 5'-3"

Standard Requirement for S = 5'-3
$t = 7"$ w/ #5 @ 12"

∴ $t = 11"$ w/ #5 @ 12" is adequate by comparison

Deck Slab Reinforcement Details

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

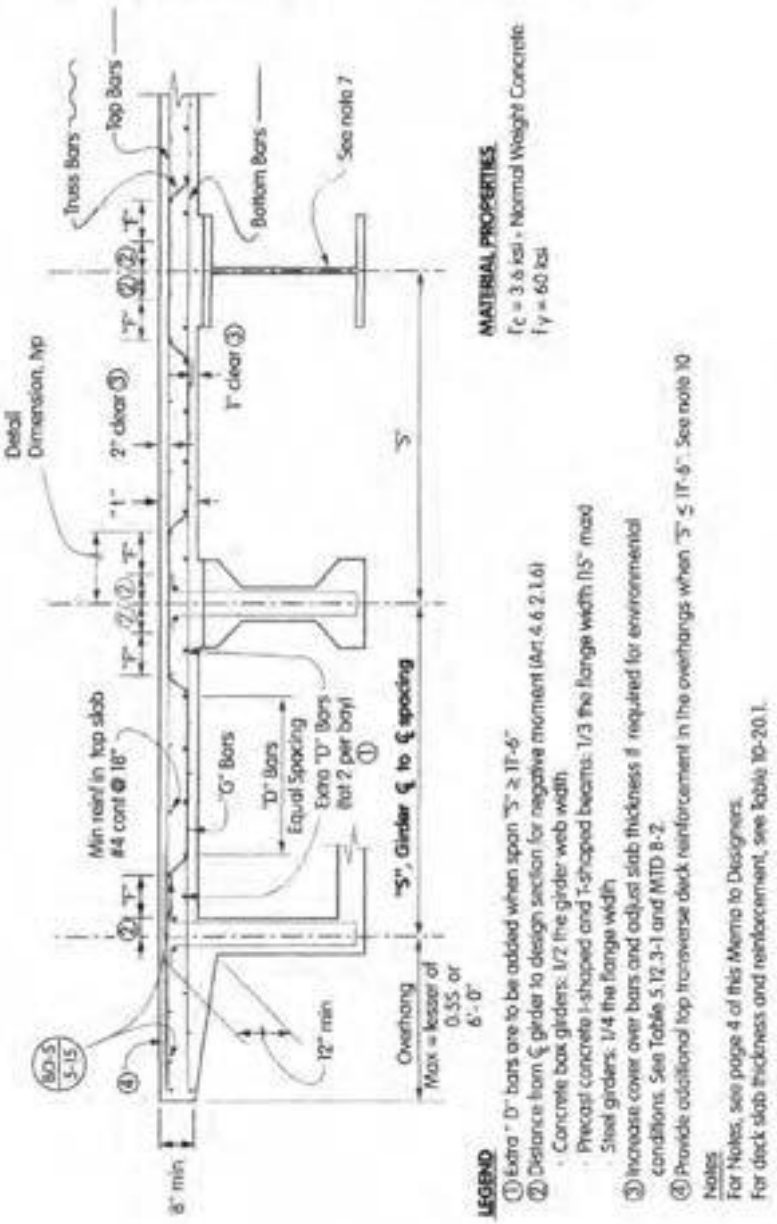


Table 10-20.1(a) Deck Slab Thickness and Reinforcement Schedule

REINFORCED CONCRETE BOX & STEEL GIRDERS w/ flange width >12"and < 24"						
"S"	"t"	Dimension	Transverse Bars		"D" Bars	"G" Bars
Girder CL to CL Spacing	Top Slab Thickness	"F"	Size	Spacing[1]	#5 Bars	#4 Bars
4'- 0"	7"	6"	#5	12"	3	2
4'- 3"	7"	6"	#5	12"	3	2
4'- 6"	7"	6"	#5	12"	3	2
4'- 9"	7"	7"	#5	12"	3	2
5'- 0"	7"	7"	#5	12"	4	2
5'- 3"	7"	7"	#5	12"	4	3
5'- 6"	7"	8"	#5	12"	4	3
5'- 9"	7"	8"	#5	11"	4	3
6'- 0"	7 1/8"	9"	#5	11"	5	3
6'- 3"	7 1/8"	9"	#5	11"	5	3
6'- 6"	7 1/4"	9"	#5	11"	5	3
6'- 9"	7 3/8"	10"	#5	11"	5	3
7'- 0"	7 1/2"	10"	#5	10"	6	3
7'- 3"	7 1/2"	11"	#5	10"	6	3
7'- 6"	7 5/8"	11"	#5	10"	6	3
7'- 9"	7 3/4"	11"	#5	10"	6	3
8'- 0"	7 3/4"	1'- 0"	#5	10"	7	3
8'- 3"	7 7/8"	1'- 0"	#5	10"	7	4
8'- 6"	8"	1'- 1"	#5	10"	7	4
8'- 9"	8 1/8"	1'- 1"	#5	10"	7	4
9'- 0"	8 1/8"	1'- 1"	#5	10"	7	4
9'- 3"	8 1/4"	1'- 2"	#5	10"	8	4
9'- 6"	8 3/8"	1'- 2"	#5	10"	8	4
9'- 9"	8 3/8"	1'- 2"	#5	10"	8	4
10'- 0"	8 1/2"	1'- 3"	#6	12"	10	4
10'- 3"	8 5/8"	1'- 3"	#6	11"	11	4
10'- 6"	8 5/8"	1'- 4"	#6	11"	11	4
10'- 9"	8 3/4"	1'- 4"	#6	11"	11	4
11'- 0"	8 7/8"	1'- 4"	#6	11"	11	4
11'- 3"	8 7/8"	1'- 5"	#6	11"	12	5
11'- 6"	9"	1'- 5"	#6	11"	12	5
11'- 9"	9 1/8"	1'- 6"	#6	11"	12	5
12'- 0"	9 1/8"	1'- 6"	#6	10"	13	5
12'- 3"	9 1/4"	1'- 6"	#6	10"	13	5
12'- 6"	9 3/8"	1'- 7"	#6	10"	13	5
12'- 9"	9 1/2"	1'- 7"	#6	10"	14	5
13'- 0"	9 1/2"	1'- 7"	#6	10"	14	5
13'- 3"	9 5/8"	1'- 8"	#6	10"	14	5
13'- 6"	9 3/4"	1'- 8"	#6	10"	14	5
13'- 9"	9 3/4"	1'- 9"	#6	10"	14	5
14'- 0"	9 7/8"	1'- 9"	#6	10"	14	5
14'- 3"	10"	1'- 9"	#6	10"	14	5
14'- 6"	10 1/8"	1'- 10"	#6	10"	15	5
14'- 9"	10 1/4"	1'- 10"	#6	10"	15	5
15'- 0"	10 3/8"	1'- 11"	#6	10"	15	5

Note: The minimum distance from centerline girder to the negative moment design section has been assumed to be 3".

1. See *Standard Plans BO-5* for additional information on transverse deck reinforcement

SIGNATURES

The parties have signed this Contract, effective as of the day and year first stated above.

CONTRACTOR

Under penalty of perjury, I certify that the information provided here is correct.

Signature:

Title: President

Additional Signature (if required):

Title:

CITY OF SACRAMENTO

A Municipal Corporation

APPROVED AS TO FORM:

Signature: Michael Voss

Title: Senior Deputy City Attorney

Reviewed By:

Signature:

Title:

Approved By:

Signature:

Title:

Additional Signature (if required):

Title:

RESOLUTION NO. 2026-

Adopted by the Sacramento City Council

June 9, 2026

E.A. Fairbairn Water Treatment Plant Grit Separator Rake Arm Replacement

BACKGROUND

A. The Fairbairn Water Treatment Plant grit separator is a critical treatment plant asset that has been in operation since the 1960s. The grit separator is necessary for the plant to operate since it is a single basin designed to collect and remove heavy solids and sediment before the water can move into the treatment process. The grit separator is only accessible while the plant is shut down, which typically only lasts a few weeks. Due to the limited time frames that the grit separator is accessible, it is crucial that all necessary rehabilitation work to the grit separator equipment be completed within one shutdown window in order to return the water treatment plant to service.

B. A competitive bid (B2614132002) was advertised and two (2) bids were received on February 18, 2026, to rehabilitate the rake arms of the grit separator. After reviewing the bids, TNT Industrial Contractors, Inc. was selected as the lowest responsible bidder with a bid amount of $389,850.

C. During the construction phase of this project, unforeseen conditions may be encountered on existing equipment that is not scheduled for replacement, and these conditions may require immediate repair or rehabilitation to maintain operational functionality. If such issues arise, it is essential that the necessary work be completed within the designated shutdown window to prevent delays in returning the water treatment plant to service.

D. Due to these circumstances, the City Manager requires authority pursuant to Sacramento City Code section 3.04.020.H to execute contract amendments up to $150,000 to provide sufficient funds to cover costs associated with any unforeseen conditions beyond the project scope that may be present at the time of construction for the Fairbairn Water Treatment Plant Rehab Project (Z14130200, Fund 6005). If no such conditions are encountered, then the additional funds shall not be used.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE CITY COUNCIL RESOLVES AS FOLLOWS:

Section 1. The City Manager or the City Manager’s designee is authorized to approve the contract plans and specifications for the E.A. Fairbairn Water Treatment Plant

Grit Separator Rake Arm Replacement Project.

Section 2. The City Manager or the City Manager's designee is authorized to execute a contract with TNT Industrial Contractors, Inc. for E.A. Fairbairn Water Treatment Plant Grit Separator Rake Arm Replacement project for an amount not to exceed $389,850.

Section 3. The City Manager or the City Manager's designee is authorized to execute a change order with Contractor in an amount not to exceed $150,000 if necessary to complete the Project.

Adopted by the City of Sacramento City Council on June 9, 2026, by the following vote:

Ayes:

Noes:

Abstain:

Absent:

Attest:

The presence of an electronic signature certifies that the foregoing is a true and correct copy as approved by the Sacramento City Council.