INVITATION FOR BIDS

City of Santa Rosa

FOR CONSTRUCTING

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

CONTRACT NUMBER

C02270

ISSUED BY

CAPITAL PROJECTS ENGINEERING DIVISION

CITY OF SANTA ROSA, CALIFORNIA

2020

Last Updated: March 1, 2016

A T T E N T I O N
Prebid Conference
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City of Santa Rosa

STATE OF CALIFORNIA

INVITATION FOR BIDS

CONTAINING:

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CONTRACT

FOR

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

Contract No. C02270

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

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CITY OF SANTA ROSA
STATE OF CALIFORNIA

NOTICE TO BIDDERS

➢	For technical questions regarding this project, contact Tammy Harrell at (707) 543-3812.
➢	For direct access to plans, specifications and planholders' lists, go to **www.srcity.org/bids** and click on Bid/Proposal Opportunities or call (707) 543-3800.
➢	For direct access to bid results, go to **www.srcity.org/bids**. Under Link to Capital Projects, click on Capital Projects Contracts or call (707) 543-3835.

- IMPORTANT –
REVISED BIDDING PROCEDURES DURING SHELTER IN PLACE ORDER

Pursuant to Order No. C19-05, the Sonoma County Public Health Officer has extended the Shelter in Place Order, which will continue until it is extended, rescinded, superseded, or amended in writing by the Health Officer or the State Health Officer. City facilities are currently closed to the public and construction meetings will be held by teleconference calls.

All bids shall be submitted and opened according to the following procedure:

Bid Acceptance Deadline

Sealed bids will be accepted at the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California 95401 until 2:00 p.m., June 3, 2020, for Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements, Contract No. C02270. (Engineer's Estimate: $250,000.00).

Bids tendered after this deadline will not be accepted. The official time clock for accepting bids will be an electric date and time stamping clock, located in the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California. In order to be accepted, bids must be received prior to 2:00 p.m. Therefore, a bid stamped in at 1:59 p.m. will be accepted, but one delivered at or after 2:00 p.m. is late and will not be accepted.

A. If you choose to mail your Bid Proposal via any of the overnight/express services, such as FedEx, UPS and USPS, the delivery MUST be a timed delivery. The delivery service MUST deliver the bid prior to the deadline time posted above. The outside envelope MUST be clearly marked as follows: [SEALED BID FOR: C02270 Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements].

B. If you choose to deliver your Bid Proposal in person, the TIME TO DELIVER BIDS is within the one hour WINDOW FOR DELIVERY prior to deadline posted above. No bids will be accepted outside of this time window.

Bid Opening Teleconference Call

Prospective bidders, subcontractors, and materials suppliers are invited to attend the Bid opening teleconference call scheduled to be held at 2:00 p.m., June 3, 2020. The teleconference can be accessed by dialing 1 (707) 543-4700, participant code 7554375#.

Project Description/Scope of Work

The project is generally described as replacement of a 48” sluice gate valve, gate operator and stem components due to failed side and bottom seals and coating of the existing Influent Diversion Box interior and Waste Hauler Vault interior to provide protection against hydrogen sulfide deterioration.

Pre-Bid Meeting Teleconference Call

Prospective bidders, subcontractors, and materials suppliers are invited to attend a pre-bid meeting teleconference call scheduled to be held at 10:00 a.m., May 26, 2020. The teleconference can be accessed by dialing 1 (707) 543-4700, participant code 0002692#.

Subcontractor Information; Department of Industrial Relations Registration

Bidders shall provide the names, business addresses and license numbers of all subcontractors listed on bidder’s List of Subcontractors. No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

CITY OF SANTA ROSA
LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS
ESTIMATED QUANTITIES

Item No.	Description	Quantity	Units
1	INFLUENT DIVERSION BOX INSPECTION, SURFACE PREP & COATING	1	LS
2	INFLUENT DIVERSION BOX GATE REPLACEMENT	1	LS
3	WASTE HAULER VAULT INSPECTION, SURFACE PREP & COATING	1	LS

The foregoing quantities are approximate only, being given as a basis for the comparison of bids, and the City of Santa Rosa does not expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, as may be deemed necessary or expedient by the Engineer.

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of the DIR pursuant to Labor Code sections 1770 *et seq.*

Contractor shall be responsible for compliance with the Immigration Reform Control Act of 1986.

If the project requires the employment of workers in any apprenticeable craft or trade, once awarded, Contractor and subcontractors must apply to the Joint Apprenticeship Council unless already covered by local apprentice standards (see Labor Code section 1777.5).

All bids are to be compared on the basis of the Engineer's estimate of the quantities of work to be performed. No bid will be awarded to a contractor who is not licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code. Contractor must hold a Class A license for this project.

Project plans, bid and contract forms for C02270 Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements may be obtained through PlanetBids at www.srcity.org/bids. These documents can no longer be obtained at the Transportation and Public Works Department.

No bid will be accepted unless it is made on the contract bid forms furnished by the Transportation and Public Works Department through PlanetBids. The original of the completed bid forms bearing original signatures must be submitted. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

The successful bidder will be required to hold a current City of Santa Rosa business tax certificate issued pursuant to Chapter 6.04 of the Santa Rosa City Code before commencing work on this project. For information regarding the business tax, contact Revenue and Collections at (707) 543-3170.

For any moneys earned by Contractor and withheld by the City of Santa Rosa to ensure the performance of the Contract, Contractor may, at its request and expense, substitute securities equivalent to the amount withheld in the form and manner and subject to the conditions provided in Section 22300 of the California Public Contract Code.

The City of Santa Rosa reserves the right to reject any or all bids and the right to waive minor irregularities or informalities in any bid or bonds.

TRACY DUENAS
Supervising Engineer

5/13/20
Date

SPECIAL PROVISIONS

General Specifications

CITY OF SANTA ROSA, CALIFORNIA

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

1 GENERAL

The work described herein shall be done in accordance with the "Contract Documents," which are the:

1. Special Provisions
2. Project Exhibit sheets entitled Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements, 2019-0038
3. City of Santa Rosa Design and Construction Standards (City Standards)
4. City of Santa Rosa Construction Specifications for Public improvements (City Specifications)
5. State of California Department of Transportation Standard Specifications 2010 (Standard Specifications), and
6. State of California Department of Transportation Standard Plans 2010 (Standard Plans).

In the event of a conflict in any of these documents, the order of precedence shall be determined by Section 5-1.02 of these Special Provisions.

Whenever the Standard Specifications use the terms State of California, Department of Transportation, Director, Engineer, or Laboratory, the following terms shall be substituted therefor, and any reference to any of the foregoing terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For State of California - the City of Santa Rosa;

For Department - the City of Santa Rosa Department of Transportation and Public Works or the City of Santa Rosa Water Department;

For Director - the City Engineer of the City of Santa Rosa;

For Engineer - the City Engineer of the City of Santa Rosa or the City Engineer's authorized agents;

For Laboratory – Materials Engineering of the City of Santa Rosa Transportation and Public Works Department, or such other laboratory as may be authorized by the City.

Unless otherwise provided, whenever in these Special Provisions attention is directed to specific provisions in the Standard Specifications, such direction shall not be interpreted as excluding other applicable provisions of the Standard Specifications.

Unless otherwise provided, when sections and subsections of the Standard Specifications are used in these Special Provisions, such use is not exclusive and shall not be interpreted as excluding other applicable provisions of said sections and subsections but is only intended to add to or modify such sections or subsections.

Unless otherwise provided, full compensation for compliance with these Special Provisions is included in the contract price and no additional allowance will be made to Contractor therefor.
The Standard Specifications are hereby modified to delete any reference or incorporation of provisions providing for or requiring arbitration of any and all claims and disputes arising under this contract.

2 BIDDING

2-1.06 Bid Documents: Prospective bidders will be furnished with an Invitation for Bids which will state the location and description of the contemplated public works project and will show the approximate estimate of the various quantities and kinds of work to be performed and materials to be furnished with a schedule of items for which unit prices are requested.

2-1.07 Approximate Estimate: The quantities given in the Contract Documents are approximate only, being given as a basis for the comparison of bids, and the City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or part of the work or to omit parts of the work, as may be deemed necessary or advisable by the Engineer.

2-1.31 Examination of Project Plans, Specifications, City Standards, Invitation for Bids and Work Site: Prior to submitting a bid, the bidder shall carefully examine the Project Plans, Invitation for Bids, City Standards and the proposed work site. If any person contemplating submitting a bid for this public works project is in doubt as to the meaning of any part of the Contract Documents, or finds discrepancies in or omissions from the Contract Documents, he or she may submit a written request for interpretation or correction to the Engineer. The written request must be received by the Engineer a minimum of **96** hours prior to bid opening. Any interpretation or correction of the Contract Documents prior to bid opening will be made only by written addendum issued by the City. A copy of such addendum will be mailed or faxed to each Planholder. The City will not be bound by any other explanations or interpretations of the Contract Documents.

2-1.33 Bid Document Completion: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

2-1.33A Bid Forms: All bids shall be made on bid forms obtained from PlanetBids at www.srcity.org/bids. The bidder shall submit its bid on the original bid forms furnished by the City. Bids submitted on forms other than the forms furnished to the bidder by the City will not be considered.

The bid forms to be submitted at the time of and with the bid are:

1. Unit Price Schedule
2. List of Subcontractors
3. List of Previous Similar Jobs
4. Noncollusion Declaration
5. Bid Guaranty Information and Bidder's Information and Signature
6. Bid Guaranty (Bid Bond or alternate security)

All bids shall give the proposed prices and must bear the original signature of the bidder. Bidders shall fill in all blanks on the bid forms where required. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

2-1.33B Registration with DIR: No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

2-1.33C Subcontractors: The Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100-4113, inclusive (the "Act") shall apply to all subcontracts in excess of one-half of one percent of the total amount of a bid. The Act requires subcontractors, if used for such work, to be listed in the contractor's bid and prohibits the substitution of subcontractors, except as authorized by the Act. Each bidder shall, with respect to the work of any subcontractor in excess of one-half of one percent of the total amount of the bid, include as part of the bid on the bid form provided:

1. The name, business address and DIR registration number of each subcontractor who will perform work or labor or render services to the Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Project Plans or other Contract Documents in an amount in excess of one-half of one percent of the Contractor's total bid; and

2. The portion of the work that will be done by each subcontractor. Only one subcontractor shall be listed for each portion.

The purchase of sand, gravel, crushed rock, batched concrete, aggregate, ready-mixed concrete, and/or any other materials produced and furnished by established and recognized commercial plants, together with the delivery of such materials to the work site by the source of the materials or by recognized commercial hauling companies, is not considered as subcontracting under this section.

2-1.33E Rejection of Bids Containing Alterations, Erasures or Irregularities: Bids may be rejected if they show any alterations of forms, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind.

2-1.34 Bid Guaranty: All bids shall be presented under sealed cover and shall be accompanied by cash, cashier's or certified check, or by a bidder's bond made payable to the City of Santa Rosa and executed as surety by a corporate surety authorized and admitted to transact a surety business in the State of California in an amount equal to ten percent of the amount of the bid. No bid shall be considered unless such cash, cashiers or certified check, or bidder's bond is enclosed with the bid. Any bidder's bond shall contain provisions for forfeiture consistent with California Public Contract Code section 20172.

2-1.40 Withdrawal of Bid: A bid may be withdrawn prior to, but not after, the hour fixed in the public notice for the opening of bids, provided that a written request to withdraw the bid, executed by the bidder or the bidder's authorized representative, is filed with the Engineer before this deadline. The withdrawal of a bid shall not prejudice the right of a bidder to submit a new bid.

2-1.43 Public Opening of Bids: Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

2-1.46 Disqualification of Bidders: Serial bids from the same bidder will not be accepted. This section shall not be interpreted to mean that the same contractor may not be the contractor in one bid and listed as a subcontractor in another bid, provided that no collusion exists.

2-1.48 Competency of Bidders: No bid will be accepted from or contract awarded to a contractor that is not licensed in accordance with the law, that does not hold a license qualifying it to perform work under this contract, to whom a bid form has not been issued by the Engineer, or that has not successfully completed projects of similar character, scope and cost to the proposed project. Bidders will be required to provide a list of previous similar jobs with their bids.

3 CONTRACT AWARD AND EXECUTION

3-1.04 Contract Award: The City reserves the right to reject any or all bids. Bids are required for the entire work described herein. All bids will be compared with the Engineer's estimate of the quantities of work to be completed. Contract award, if any, will be made to the lowest responsible bidder within sixty days from the date bids are opened.

3-1.05 Contract Bonds: The successful bidder will NOT be required to furnish a performance bond or material guaranty bond for this project. In the event that the contract award exceeds $25,000.00, the successful bidder will be required to provide a payment bond for labor and materials within ten days after receipt of the Notice of Award in accordance with California Civil Code section 9550, executed in a sum of 100% of the Contract price. **A BID BOND IS REQUIRED. REFER TO SECTION 2-1.34 OF THESE SPECIAL PROVISIONS.**

The bond(s) shall be provided in a form acceptable to the City and issued by a corporate surety in good financial standing and authorized and admitted to transact a surety business in the state of California for the purposes and in the amount(s) stated above.

Whenever the financial or legal status of any surety on any such bond(s) is/are unacceptable to the City, it may make a demand to Contractor for further bond(s) or additional surety, not exceeding the sums originally required. Thereafter, no payment shall be made upon the Contract to Contractor or any assignees of Contractor until such bond(s) or additional surety has/have been provided to the City.

3-1.07 Indemnification and Insurance: Indemnification: Contractor shall defend, hold harmless and indemnify City, its officers, agents and employees, 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, 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 the performance of or the failure to perform the Contract by 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 such Liabilities are caused in part by a party indemnified hereunder, or such Liabilities are litigated, settled or reduced to judgment; provided, that the foregoing indemnity does not apply to liability for any damage or expense for death or bodily injury to persons or damage to property 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 (excluding Contractor), or (ii) the active negligence of City.

The existence of any of the insurance policies or coverages described in this Contract shall not affect or limit any of City's rights hereunder, nor shall the limits of such insurance limit Contractor's liability to the City hereunder. The provisions of this section shall survive any expiration or termination of the Contract.

Insurance: Contractor shall maintain in full force and effect all of the insurance coverage described in and in accordance with the insurance requirements set forth below. Maintenance of such insurance coverage during the entire performance of the Contract is a material element of the Contract. Failure by Contractor to (i) maintain or renew coverage, (ii) provide notice of any changes, modifications, or reductions in coverage, or (iii) provide evidence of renewal, if necessary, may be deemed a material breach of the Contract by Contractor, whereas the City

shall be entitled to all rights and remedies at law or in equity. Notwithstanding the foregoing, any failure by Contractor to maintain required insurance coverage shall not excuse or alleviate Contractor from any of its other duties or obligations under the Contract. In the event Contractor retains or utilizes any subcontractors or sub-consultants in performance of the work, Contractor shall assure that any such subcontractor has first obtained, and shall maintain, all of the insurance coverage requirements herein set forth below.

Insurance Requirements:

A. Insurance Policies: Contractor shall maintain and keep in full force and effect, the following policies of insurance with minimum coverage as indicated below and issued by insurers with an AM Best rating of no less than A-:VI or a rating otherwise acceptable to the City.

	Insurance	Minimum Coverage Limits	Additional Coverage Requirements
1.	Commercial general liability	$ 3 million per occurrence $ 3 million aggregate	Coverage must be at least as broad as ISO CG 00 01 and must include products liability and completed operations coverage which shall continue for a period of 365 days after acceptance of the work by the City. If insurance applies separately to a project/location, aggregate may be equal to per occurrence amount. Coverage may be met by a combination of primary and umbrella or excess insurance, but umbrella and excess shall provide coverage at least as broad as specified for underlying coverage. Coverage can be provided in the form of an endorsement to Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 23 37 forms if later revisions used). Coverage shall not exclude subsidence.
2.	Business auto coverage	$ 1 million	ISO Form Number CA 00 01 covering any auto (Code 1). Insurance shall cover owned, non-owned and hired autos.
3.	Workers' compensation and Employer's Liability	$ 1 million	As required by the State of California, with Statutory Limits and Employer's Liability Insurance with limit of no less than $1 million per accident for bodily injury or disease. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents and subcontractors.

B. Endorsements:

1. All policies shall provide or be endorsed to provide that coverage shall not be canceled by either party, except after prior written notice has been provided to the City in accordance with the policy provisions.
2. Liability policies shall provide or be endorsed to provide the following:
    a. For any claims related to this Contract, Contractor's insurance coverage shall be primary, and any insurance or self-insurance maintained by City shall be in excess

of Contractor's insurance and shall not contribute with it. Endorsements at least as broad as 20 01 04 13 or evidence of policy language will be required in non-ISO CGL policies.

b. The City of Santa Rosa, its officers, agents and employees are to be covered as additional insureds on the CGL policy. Additional Insured Endorsements at least as broad as 20 10 04 13 or 20 38 04 13 are required.

C. Verification of Coverage and Certificates of Insurance: Contractor shall furnish City with original certificates and endorsements effecting coverage required above. Certificates and endorsements shall make reference to policy numbers. All certificates and endorsements are to be received and approved by the City before work commences and must be in effect for the duration of the Contract. The City reserves the right to require complete copies of all required policies and endorsements during the duration of the Contract and for a period of 365 days following City's acceptance of the work.

D. Other Insurance Provisions:

1. No policy required by this Contract shall prohibit Contractor from waiving any right of recovery prior to loss. Contractor hereby waives such right with regard to the indemnitees.
2. All insurance coverage amounts provided by Contractor and available or applicable to this Agreement are intended to apply to the full extent of the policies. Nothing contained in this Agreement limits the application of such insurance coverage. Coverage for an additional insured shall NOT be limited to the insured's vicarious liability. Defense costs must be paid in addition to coverage amounts.
3. Self-insured retentions above $10,000 must be approved by the City. At the City's option, Contractor may be required to provide financial guarantees.
4. City reserves the right to modify these insurance requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

3-1.18 Contract Execution: The fully executed Contract, original bonds and insurance certificates and endorsements required under the Contract shall be delivered to the City within ten calendar days of Contractor's receipt of the Notice of Award.

The Engineer will supply Contractor with up to ten sets of the Invitation for Bids and Project Plans. At least one complete set of the Invitation for Bids and Project Plans shall be kept at the construction site in good condition and made available to the Engineer at all times. Additional copies of the Invitation for Bids and Project Plans will be provided by the Engineer at Contractor's cost.

3-1.20 Failure to Execute Contract: Contractor's failure to deliver to the City the fully executed Contract within ten calendar days of Contractor's receipt of the Notice of Award shall be cause for the cancellation of the award and the forfeiture of the bid guaranty to the City. If the successful bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder. The refusal or failure by the second or third lowest responsible bidder to deliver to the City the fully executed Contract within ten calendar days of receipt of the Notice of Award to the respective bidder shall likewise be cause for the cancellation of the award and the forfeiture of the bid guaranty of the respective bidder. In its discretion, the City may then re-advertise the project or construct it by day labor.

3-1.21 Return of Bid Guarantees: Within ten days after the opening of bids, the City will return the bid guarantees to all bidders except the three lowest responsible bidders. The bid guarantees

of the three lowest responsible bidders will be retained until the Contract has been fully executed. In the event all bids are rejected, all bid guarantees will be returned to the respective bidders.

3-1.22 Subcontractors: The successful bidder shall furnish a list of all subcontractors as required under Sections 2-1.33C. The list shall include the name, business address, DIR registration number and the state contractor's license number of each subcontractor on the list and the names of the responsible managing employees whose names appear on the subcontractors' licenses.

4 SCOPE OF WORK

4-1.05 Changes and Extra Work: All changes to the Contract shall be made by written change order only.

All extra work shall be recorded by Contractor on a daily report signed by both the City and Contractor. The "daily reports" shall thereafter be considered the true record of extra work performed. A copy of the daily reports will be furnished to Contractor. Contractor is directed to Section 9-1.04 of this Invitation for Bids.

4-1.05C Compensation for Altered Quantities: Payment and compensation for altered quantities shall conform to the provisions of Section 9-1.06 of the Standard Specifications, except as modified herein.

5 CONTROL OF WORK

5-1.02 Contractor's Copies of Contract Documents: In the event of a conflict in any of the Contract Documents, the order of precedence from highest to lowest shall be as follows:

1. Special Provisions
2. Project Exhibit sheets entitled Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements, 2019-0038
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

5-1.05 Order of Work: The work as shown on the Project Plans and as specified in the Invitation for Bids shall be constructed in a sequence that is satisfactory to and approved by the Engineer.

Contractor shall prepare a work schedule per Section 8-1.02 of the Standard Specifications.

With the exception of trenching, all existing street, street light base, curb and gutter, storm drain, water line, and sewer line work shall be completed before any existing street paving is removed.

Full compensation for the conformance to the requirements of this section is included in the Contract price and no additional allowance will be made to Contractor for this work.

5-1.17 Character of Workers: Contractor is directed to Section 5-1.17 of the Standard Specifications which states:

> "If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work."

No additional compensation shall be granted to Contractor in the event City exercises any part of its rights under this section and any and all costs related to such exercise shall be borne by Contractor.

5-1.20 Cooperation with Other Entities: Attention is directed to Section 5-1.20 of the Standard Specifications.

Other construction including but not limited to utility, power, and pipe line relocation, may be in progress by other forces within and adjacent to the project area at the same time work is being performed under this Contract by Contractor.

Contractor shall cooperate with the forces performing other work, to the end that such forces may conduct their operations with as little inconvenience and delay as possible. Contractor shall grant such forces access to the project area as is reasonable and necessary to transport materials and equipment to the site of operations by the other forces.

5-1.20B(4)(a) Offsite Staging Areas and Construction Yards: Attention is directed to Santa Rosa City Code section 20-52.040, Temporary Use Permit.

A Temporary Use Permit shall be obtained for any offsite construction yard on private property to be used for any of the following:

a. Stockpiling of equipment and/or materials;

b. Staging of construction;
c. Placement of work trailers or mobile offices;
d. Storage of trench spoils; or
e. Other construction related activities not specifically enumerated above.

5-1.26 Lines and Grades: Contractor shall carefully preserve all bench marks, grade stakes, and all other survey markers. In the case of willful or careless destruction, Contractor shall bear the cost of replacing the markers.

Contractor shall contact the Engineer directly for coordination of survey staking. Written staking requests must be submitted at least two working days in advance of the date and time stakes are needed.

5-1.27B Examination and Audit: Pursuant to California Government Code section 8546.7, any contract with the City involving expenditures in excess of $10,000 shall be subject to the examination and audit of the California State Auditor for a period of three years after final payment is made to Contractor by City under this Contract. Any such examination and audit will be confined to those matters connected with the performance of this Contract.

5-1.30A Inspection: Contractor shall bear all costs associated with the re-inspection of any defective, rejected or unauthorized work as determined by the Engineer in Engineer's sole discretion. Such costs of re-inspection, including any costs incurred by the City for additional staff time or fees for third-party consultant inspectors, will be deducted from one or more progress payments hereunder.

5-1.36A Property and Facility Preservation: Attention is directed to Section 5-1.36 of the Standard Specifications.

At Contractor's sole expense, all fences, gates, landscaping, drainage ditches, sidewalks, irrigation systems, and any other improvements that are damaged, removed or destroyed because of Contractor's operations, shall be replaced in accordance with City Standards at a minimum and restored to the same or better condition. Concrete surface treatment and score marks shall match adjacent existing concrete improvements.

5-1.36E Obstructions: Attention is directed to Section 5-1.36 of the Standard Specifications and to the possible existence of underground gas mains, high voltage lines, telephone ducts, storm drains and water and sewers systems, the locations of which are not shown on the Project Plans. The determination of the location of these facilities and the cost of repair or replacement in the event of damage to such facilities are the sole responsibility of Contractor.

Should Contractor alter any public utility or private improvements to facilitate its operations or for its sole benefit, which alteration would not be otherwise required, Contractor shall make whatever arrangements are necessary with the owner or controlling authorities and shall bear all expenses in connection therewith. Any damages to any public utility or private improvement caused by Contractor shall be repaired by Contractor at its sole expense and to the full satisfaction of the Engineer or the controlling authority.

Any subsurface information and data furnished under any part of this Contract are not intended as a representation or warranty but are furnished for information only. It is expressly understood that the City will not be responsible for the accuracy thereof or for any deduction, interpretation or conclusion drawn therefrom by Contractor. The information is made available so that Contractor may have ready access to the same information available to the City and is not part of this Contract.

PRIOR TO STARTING ANY EXCAVATION, CONTRACTOR SHALL (AT LEAST TWO WORKING DAYS IN ADVANCE) CALL UNDERGROUND SERVICE ALERT (USA) toll free at (800) 227-2600

and provide USA with all necessary data relative to the proposed excavation. USA will accept calls and process information to participating agencies who have underground facilities in the area between the hours of 7:30 a.m. and 5:00 p.m. daily, except Saturdays, Sundays, and holidays. Between the hours of 5:00 p.m. and 7:30 a.m., calls will be recorded and then processed after 7:30 a.m. For emergency situations, after hours, and on Saturdays, Sundays and holidays, Contractor shall contact the owner of the affected facility.

Contractor shall coordinate all work with the appropriate City field personnel. When City work forces are required at the job site to perform Contract items of work, Contractor shall give a minimum of two working days advanced notification to the appropriate field office:

Water Division:	(707) 543-4200
Sewer Division:	(707) 543-4200
Street Division:	(707) 543-3880
Survey Division:	(707) 543-3834

5-1.43 Potential Claims and Dispute Resolution: "Claim" means a separate demand by Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following: (A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by the City under the Contract; (B) Payment by the City of money or damages arising from work done by, or on behalf of, Contractor pursuant to the Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; or (C) Payment of an amount that is disputed by the City.

Upon receipt of a Claim, the City shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed, provided, the parties may extend the 45 day time period by mutual agreement.

If the City needs approval from the City Council to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the Claim, and the Council does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a Claim, the City shall have up to three days following the next duly publicly noticed meeting of the City Council after the 45-day period, or extension expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. If the City fails to issue a written statement, the Claim shall be deemed rejected in its entirety.

If a Contractor disputes the City's written response, or if the City fails to respond to a Claim within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the City shall conduct a meet and confer conference within 30 days for settlement of the dispute. Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the City shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. Any disputed portion of the Claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with the City and the Contractor sharing the associated costs equally. The City and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

6 CONTROL OF MATERIALS

6-2.01 Source of Supply and Quality of Materials: All materials required to complete the work under the Contract shall be furnished by Contractor and shall be free of hazardous substances.

6-3.01 General: Statistical means will not be used by the City for determination of Standard Specification compliance. Whenever both operating range test results and Contract compliance requirements are specified in these special provisions, the operating range requirements shall apply to the individual test results.

6-3.01A Material Submittals: Upon award of the Contract by City, Contractor shall submit to the Engineer a list of all materials proposed to be used on this project and any supporting documentation and/or samples required and source of supply.

For material listed on the "Engineer's List of Approved Items" which is located in the Sewer and Water sections only of the City Standards, the Engineer shall be provided with the name of the manufacturer and model/part number for all material proposed for this project, unless that item has been replaced as shown on the Project Plans or in the Invitation for Bids.

For all other materials used on this project, regardless of the type of work, Contractor shall provide to the Engineer the name of the manufacturer and model/part number along with supporting documentation and/or samples that will allow the Engineer to determine the material's acceptability.

The Engineer reserves the right to reject any proposed material, whether on the City's "Engineer's List of Approved Items" or not. If the City obtains information indicating that a listed item is not performing satisfactorily or is found to be defective, that item will be rejected and Contractor shall submit a replacement for review at no additional cost to the City.

6-3.01B Material Guarantee: Before any contract is awarded, the bidder may be required to furnish samples of materials and detailed descriptions of equipment to be used in the construction of the project. The materials samples may be subjected to the tests provided for in the Standard Specifications or in this Invitation for Bids to determine their quality and fitness for the project. The successful bidder shall unconditionally guarantee project materials and workmanship for a period of one year from the date of recording of the Notice of Completion. The guarantee shall cover 100% of all costs of repairs within the one year period, including all costs of labor, materials, equipment, and incidentals. Except as may be otherwise provided in Section 3-1.05, the successful bidder shall provide a surety bond executed by a corporate surety authorized and admitted to transact a surety business in the state of California in the minimum amount of one-half of the Contract price to cover this guarantee.

6-3.05 Quality Assurance: California Test 216 (Relative Compaction) testing will be modified as follows: A mechanical compactor (Ploog Engineering Co. Model M 100 or equivalent) with 10-pound hammer and split compaction molds shall be used in lieu of the specified manual compaction equipment.

California Test 231 (Nuclear Gage Determination of In-Place Density) will be modified as follows: In-place density and relative compaction may be determined on the basis of individual test sites in lieu of the area concept, at the discretion of the Engineer.

6-4 Water Utility

6-4.01A Construction Water: All water required for the performance of the work shall be provided by Contractor. Prior to obtaining water from the City's water system, Contractor shall obtain a Water Use Permit from the City of Santa Rosa Water Department and rent a hydrant or bridge meter. Contractor is responsible for the cost of all water and the cost of all deposits, permits and fees.

Contractor is prohibited from operating gate valves or fire hydrants on the City system.

The acquisition of water from the City's water system through un-metered hydrants or other facilities is a violation of City ordinance and State law. The use of water from sources other than the City's water system must be approved by the Engineer in advance of the use.

Citations and fines will be levied for violation of these and other utility regulations and deductions will be made from payments consistent with Section 7-1.02A(1) of the Standard Specifications.

6-4.01B Water Utility Notification: Contractors or parties requiring work of any kind by the City of Santa Rosa Water Department forces shall request such services a minimum of 48 hours in advance of the time such services are desired. Work requests which will involve the City of Santa Rosa Water Department forces for more than eight hours or an extensive number of City parts shall be requested a minimum of seven calendar days in advance.

If it is necessary to terminate or disrupt utility service to any customer, Contractor shall make the request for such work by City forces an additional 72 hours (three additional working days for a total of five working days advance notice) in advance of the time such services are desired to allow affected customers a minimum of 72 hours' notice. Contractors who fail to keep field appointments will be billed for scheduled City of Santa Rosa Water Department crew standby time which was used and the Contractor shall bear the costs incurred by the City of Santa Rosa's Water Department for re-notification of customers.

City of Santa Rosa Water Department crews work a 9/80 schedule. This schedule may prohibit shutdowns for tie-ins on alternating Fridays. After hours work or weekend work may be performed if prior authorization from the Engineer is obtained.

Other than the hours specified in this Invitation for Bids, requests by Contractor for after hours or weekend work is to be avoided whenever possible. Any overtime costs incurred by City for such work shall be borne by Contractor.

Interruption of utilities service to commercial customers shall be coordinated with the customer to minimize disruption to the enterprise to the greatest extent practicable. After notification by the Contractor of the need, the City of Santa Rosa Water Department will contact all commercial customers and inform Contractor accordingly.

6-4.01C Water Facility Damage: All damage caused to the City's water system shall be immediately reported to the Engineer.

Damage caused to the City's water system by Contractor's operations shall be repaired by the Contractor at Contractor's sole expense in a manner satisfactory to the City of Santa Rosa Water Department. Such repairs shall not be charged to the City or any City project. All repair work shall be witnessed and approved by the City of Santa Rosa Water Department prior to backfilling the excavation. The City will require re-excavation if backfilling occurs prior to inspection, which costs shall be borne by Contractor.

Contractor is responsible for, at its sole cost and expense, the repair and remediation of damage to property and facilities caused by any of the following circumstances:

a. Contractor fails to make a written request for a markout or begins excavation without providing the City of Santa Rosa Water Department a reasonable opportunity to mark facilities;
b. Contractor destroys markouts;
c. Contractor fails to perform hand digging or probing for utilities near markouts; or
d. Contractor fails to use reasonable caution, regardless of whether markouts are present or clear. Reasonable caution includes any efforts to avoid damaging existing facilities, such as when excavating in the vicinity of water mains.

City may, in its discretion, opt to make the repairs for which Contractor is responsible with its own forces. In such cases, the repairs will be made at Contractor's expense in accordance with the emergency repair rate schedule of the City of Santa Rosa Water Department. The City may make repairs whenever restoration of service requires extraordinary speed or special equipment. Contractor will be billed accordingly and City shall have the right and option to withhold payment hereunder, or a portion thereof, for any such costs billed but not promptly paid by Contractor.

6-4.02 Salvage: All valves, hydrants, and other appurtenances of the water system that are the property of City and removed by Contractor shall be delivered to the City's Municipal Services Center (55 Stony Point Road) unless Contractor has obtained specific written approval from the City of Santa Rosa Water Department to otherwise dispose of the materials.

6-4.03 Trade Names and Alternatives: Unless otherwise specified, material and equipment specifications that identify a particular patent, trade name or manufacturer, may be satisfied through substitute materials and equipment accepted by the City. Contractor may offer substitute materials and equipment of equal or better quality to the City. Any such offer shall be made in writing to the Engineer at least four weeks in advance of the time Contractor wishes to order the materials or equipment. Contractor shall include sufficient data which, together with any other information the Engineer may require, will enable the Engineer to determine the acceptability of the materials and equipment. When the substitute materials or equipment necessitate changes to any part of the work, the information shall include drawings and details showing all such changes and Contractor shall perform these changes as a part of any acceptance of substitute materials or equipment. The use of substituted materials and equipment will be permitted only after written acceptance of the materials and equipment by the Engineer. Such acceptance shall not relieve the Contractor from full responsibility for the sufficiency, quality and performance of the substitute materials and equipment.

The City will not, under any circumstances, acknowledge or consider any offers to accept substitute materials or equipment between the dates of public notice of advertisement and the bid opening.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.02A(1) Forfeitures for Health and Safety Violations: Contractor shall comply with all applicable provisions of the Santa Rosa City Code and any failure to do so shall constitute a breach of the Contract. In the event of any violation of the Santa Rosa City Code that may impact public health and safety, including, but not limited to Chapter 17-12, "Storm Water" and Chapter 13-04, "Street Encroachments," City shall have the right to impose a charge against Contractor in an amount equal to $500.00 per violation per day. Prior to the imposition of any charge hereunder, City shall first provide a written notice to Contractor of the violation and setting forth a reasonable period of time for Contractor to cure the violation(s). In the event Contractor fails to cure any such violation within the time provided, City shall have the right, in addition to all other rights and remedies available to City, to deduct and withhold as a permanent forfeiture by Contractor the appropriate amounts from any payment otherwise due Contractor under this Contract.

7-1.02K(2) Wages: Pursuant to Labor Code sections 1770 *et seq*., each laborer or mechanic of Contractor or any subcontractor engaged in work on the project under this contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any subcontractor and such laborers and mechanics. A copy of the schedule of prevailing wage rates can be obtained online at www.dir.ca.gov or from the Department of Transportation and Public Works at 69 Stony Circle, Santa Rosa.

Any laborer or mechanic employed to perform work on the public works project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing wage rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by the worker.

The foregoing specified prevailing wage rates are minimum rates only, and Contractor may pay any wage rate in excess of the applicable rate.

Pursuant to Labor Code Section 1775, Contractor as a penalty to the owner shall forfeit not more than $200.00 for each calendar day, or a portion thereof, for each worker paid less than the prevailing wage rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

Contractor shall only provide prevailing wage reports upon written request from City. When requested, these prevailing wage reports must be redacted by the Contractor prior to providing them to City.

7-1.02K(4) Apprentices: Contractor agrees to comply with Chapter 1, Part 7, Division 2, sections 1777.5 *et seq*. of the California Labor Code. These sections require contractors and subcontractors to employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice work for each five hours of journeyman work (unless an exception is granted in accordance with Section 1777.5), and the contractors and subcontractors shall not discriminate among otherwise qualified employees as apprentices solely on the ground of sex, race, religion, creed, national origin, ancestry, or color. Only apprentices as defined in Labor Code section 3077, who are in training under apprenticeship standards and who have written apprentice agreements will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeable occupations.

7-1.02K(6)(a)(1) Notice to Vendors: Attention is directed to the current OSHA Standards. All equipment, tools and materials which are furnished and/or installed as part of this Contract shall meet or exceed the aforementioned standards in order to be considered acceptable.

7-1.02K(6)(b) Excavation Safety: When the digging or excavation occurs during project construction, Contractor shall:

a. Promptly notify City in writing of the following conditions before any such conditions are disturbed:

    1. Material that the Contractor believes may be hazardous waste as defined in Health and Safety Code section 25117 that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law;
    2. Subsurface or latent physical conditions at the site differing from those indicated in the Invitation for Bids; and
    3. Physical conditions at the site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in the type of work under the Contract.

b. The City will investigate the conditions and will issue a change order under the terms of the Contract if it finds that the conditions warrant it.

c. If a dispute arises between City and Contractor as to whether a change order is warranted, Contractor shall not be excused from any scheduled completion date provided for in the Contract but shall proceed with all work to be performed under the Contract.

7-1.02K(6)(b)(1) Trench Excavation Safety Plans: When the estimated cost for the excavation of any trench or trenches five feet or more in depth will exceed $25,000.00, Contractor shall submit to the Engineer in advance of excavation a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards established by the construction safety orders, or if the trench is anticipated to be greater than 20 feet, the plan shall be prepared by a registered civil or structural engineer.

A permit to do the above described work shall be obtained from the State of California, Division of Industrial Safety. Proof of such permit shall be submitted to the Engineer prior to starting the trench work.

Full compensation for complying with the provisions of this section shall be considered as included in the Contract price and no additional allowance will be made for the work.

7-1.02K(6)(d) Confined Space Safety: Any confined space entry for this project, including but not limited to manhole or water storage tank entry, will require a confined space entry permit pursuant to Cal/OSHA regulations as set forth in title 8 California Code of Regulations (CCR) sections 5157 or 5158. Confined space entry shall have the meaning ascribed in title 8 CCR sections 5157 and 5158. For any confined space entry for construction operations regulated by title 8 CCR section 1502, Contractor shall comply with title 8 CCR section 5158, “Other Confined Space Operations.” For any other confined space operations, Contractor shall comply with title 8 CCR section 5157, “Permit-Required Confined Spaces.”

Attention is directed to the technical specifications in the Special Provisions for information regarding entry to any City maintained confined space. Pursuant to title 8 CCR section 5157, Contractor is required to obtain any available information regarding hazards and operations for any City maintained confined spaces. The City maintained Confined Space Entry Manual is available

for viewing at the City of Santa Rosa Water Department or Transportation and Public Works Department office at 69 Stony Circle, Santa Rosa.

Contractor shall immediately inform the Engineer of any previously unidentified hazards confronted or created during confined space entry.

7-1.02K(6)(3) Order of the Health Officer of the County of Sonoma: Contractor shall comply with the Order of the Health Officer of the County of Sonoma N0. C19-09, dated May 1, 2020. Contractor must submit a project specific health and safety plan, with particular attention to the social distancing protocols and construction field safety work requirements, for Engineer approval.

7-1.02L(2)(a) Patents and Royalties: All fees, royalties, or claims for any patented invention, article, process or method that may be used upon or in any manner connected with the work under this Contract shall be paid by Contractor. Contractor and its sureties shall protect and hold harmless City and its officers, agents, and employees from any and all demands made for such fees royalties or claims brought or made by any third party, and before the final payment is made on the account of the Contract, Contractor shall, if requested by City, furnish acceptable proof of a proper release from all such claims and liabilities.

Should Contractor, its officers, agents, or employees, or any one of them be enjoined from furnishing or using any invention, article, material, or plans supplied or required to be supplied or used under the Contract, Contractor shall promptly substitute other articles, materials, or appliances in lieu thereof of equal efficiency, quality, finish, suitability, and market value, and satisfactory in all respects to the Engineer. In the event that the Engineer elects, in lieu of such substitution, to have supplied and to retain and use any such invention, article, materials, or plans as may be required to be supplied by the Contract, Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for City, its officers, agents, and employees, or any one of them to use such invention, article, materials, or appliance without being disturbed or in any way interfered with by any proceeding in law of equity on account thereof. Should Contractor neglect or refuse to make the substitution promptly or to pay such royalties and secure such licenses as may be necessary, then in that event the Engineer shall have the right to make such substitutions or City may pay such royalties and secure such licenses and charge Contractor even though final payment under the Contract may have been made.

7-1.02M(3) Mined Materials: California Public Contract Code section 20676 prohibits surface mining operators which are subject to the Surface Mining and Reclamation Act of 1975 (SMARA) from selling California mined construction material to the City unless the operator is identified in a list referred as the **3098 List**. The List, which is maintained by the Department of Conservation's Office of Mine Reclamation (OMR), changes throughout the year and can be viewed at the OMR website: http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm. To confirm whether or not a specific operator is on the List at any given time, Contractor shall call the OMR at (916)323-9198.

7-1.03A Maintaining Traffic: Attention is directed to Sections 7-1.04 of the Standard Specifications and to the following modifications thereof.

If construction is within City owned right-of-way, provisions shall be made for the safe passage of public traffic through the work site at all times consistent with the requirements of Santa Rosa City Code Chapter 13-04.

Except for projects to be performed under a minor contract, Contractor shall install and maintain project identification signs at each end of the project or as directed by the Engineer two weeks prior to any construction activity. City shall furnish the appropriate sign panels upon request from Contractor. To mount the sign panels, Contractor shall furnish and install 4" X 4" posts or mount by other appropriate methods as approved by the Engineer. These sign panels shall be returned to the City Corporation Yard at 55 Stony Point Road after completion of the project.

Two weeks prior to any construction activity, advance notice signs for road closures shall be furnished and installed by Contractor at each end of the project and shall remain in place throughout the duration of the subject closure. Details of panel construction and lettering shall be approved by the Engineer.
Contractor shall furnish, install, and maintain at its expense all barricades, signs, lights, and other devices necessary to adequately warn of any obstructions to the traveled and pedestrian way and provide flaggers as necessary for the safety of public traffic and pedestrians and to provide access to property adjacent to the work site and Contractor shall comply with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101, *et seq*.) (ADA) and any regulations and guidelines issued pursuant to the ADA.

Contractor shall comply with the current edition of the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all items related to traffic within the work site.

Rain and other occurrences that may cause the suspension or delay of the work shall in no way relieve Contractor of its responsibility to provide traffic control and public access through the work site as specified herein. At all times, Contractor shall keep at the work site such materials, forces and equipment as may be necessary to keep roads, streets, and driveways within the work site open to traffic and in good repair and shall expedite the passage of such traffic, using such forces and equipment as may be necessary.

Should Contractor fail, in the opinion of the Engineer, to provide all the materials, forces and equipment necessary to maintain traffic through the work site as set forth herein, City may take steps necessary to remedy any such failure, including but not limited to causing such work to be performed and/or suspending any further work under the Contract. Any such remedial cost and expense incurred by the City, plus an administrative charge of 15%, shall be immediately due and payable by Contractor and may be deducted from any amounts owed to Contractor hereunder. In the event there are insufficient sums owed to Contractor hereunder to cover the foregoing costs and charges, City shall have the right to pursue any other remedy to recover the same, including but not limited to, proceeding against any surety or bond in favor of City. City's rights under Section 7-1.02 are intended to be in addition to and not in lieu of any charges imposed by City against Contractor under Section 7-1.02A(1) above for violations of the Santa Rosa City Code.

Contractor shall be responsible for informing emergency response agencies operating within the area of the work of obstructions to either public or private roads caused by reason of Contractor's operations hereunder.

Contractor shall make provisions for the safe passage of pedestrians around the project work site at all times.

8 PROSECUTION AND PROGRESS

8-1.01A Assignments: Once awarded, this Contract shall not be transferred, assigned, or sub-contracted, except as herein expressly provided without the prior written consent of the City in the City's sole and absolute discretion. See Section 5-1.12 of the Standard Specifications.

8-1.04B Standard Start: Contractor shall begin work within ten calendar days after the date authorized in the Notice to Proceed and shall diligently prosecute the Contract.

8-1.05 Time: All work shall be completed by **October 15, 2020**.

See Section 01140 Work Restrictions.

Unless otherwise directed by Engineer, Contractor shall not conduct any activities that generate noise earlier than 7:00 a.m. or later than 7:00 p.m.

Contractor may work 6 days per week upon approval from the Engineer. No work on Sundays will be allowed.

8-1.10 Liquidated Damages: Contractor hereby agrees that Contractor shall pay to the City liquidated damages for each and every calendar day delay over and above the number of working days prescribed above for finishing the work in the amount shown in Section 8-1.10 of the Standard Specifications.

9 MEASUREMENT AND PAYMENT

9-1.04 Force Account Work: All work done on a force account basis shall be recorded daily on report sheets prepared by Contractor and signed by both the Engineer and Contractor. Such reports shall thereafter be considered the true record of force account work performed during the project. Such reports shall be furnished to the Engineer and a copy retained by Contractor.

All extensions of labor, equipment, and material costs shall be completed by Contractor and submitted to the Engineer within 30 days of the completion of the extra work. Completed and extended extra work reports received later than the times herein prescribed may be deemed invalid and rejected without payment at the discretion of the Engineer.

9-1.07 Payment Adjustments For Price Index Fluctuations: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

9-1.16 Progress Payments: Once each month for progress pay purposes, the City will prepare a written estimate of the total amount of completed work and accepted materials purchased by Contractor but not installed. The City shall retain five percent of such estimated value of the completed work and the unused materials and pay Contractor the balance after deducting all previous payments and all sums to be retained under the provisions of the Contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract or when, in the Engineer's judgment, the total value of the completed work since the last estimate is less than $500.00. No such estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

After Contract acceptance, the Engineer will prepare a written proposed final estimate of the proposed final quantities of work completed under the Contract and the value of such work and will submit such estimate to Contractor. The City shall retain five percent of such estimated value of the work done and shall pay to Contractor the balance after deducting all amounts to be retained under the provisions of the Contract.

The City may, at its option and at any time, retain out of any amounts due Contractor sums sufficient to cover any unpaid claims of City or others, provided that sworn statements of all non-City claims shall have been filed with the Director of Finance.

9-1.16E(6) Substitution of Securities for Withheld Amounts: Pursuant to Public Contract Code section 22300, securities may be substituted for any moneys withheld by City to ensure performance under this Contract, provided that substitution of securities provisions shall not be required in contracts in which there will be financing provided by the Farmer's Home Administration of the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 USC sections 1921 *et seq*.), and where federal regulations or policies or both do not allow the substitution of securities. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a state or federally chartered bank as the escrow agent, which shall then pay such moneys to Contractor. The Director of Finance is authorized to execute substitution of securities agreements on behalf of the City. The City will return the securities to Contractor upon satisfactory completion of the Contract as determined by City in its sole discretion and the resolution of all outstanding claims against the securities. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by Contractor and the

City, provided that the substituted security is equal to or not less than five percent of the Contract amount.

Security substitutions must be submitted by Contractor and approved by City prior to the time of the first progress payment to be made under the Contract. No other method of substituting securities for retention will be accepted. The security substitution shall be done only upon execution of an agreement satisfactory to City which includes the following provisions:

a. The amount of securities to be deposited;
b. The terms and conditions of conversion to cash in case of the default of Contractor; and
c. The procedure for return of securities upon completion of the Contract.

9-1.17D Final Payment and Claims: The processing of payment of the final estimate shall not be commenced less than 35 days after the date of recording of the Notice of Completion with the County Recorder's Office. Contractor is advised that it takes approximately ten days for a check to be issued following a request for payment.

Contractor shall submit its written statement of all claims for additional compensation under the Contract to the Engineer within 15 days after submission to Contractor of the proposed final estimate.

If Contractor does not file a claim within the 15 day period, or upon Contractor's approval, the Engineer will issue a final written estimate and the City shall pay to Contractor the entire sum due after deducting all previous payments, if any, and all amounts to be retained under the provisions of the Contract.

If Contractor files a claim within the 15 day period, the Engineer will furnish a semi-final estimate and pay the amount due under the semi-final estimate within 30 days. The semi-final estimate is conclusive as to the amount payable except as may be affected by claims and any amount retained. The Engineer shall then consider and investigate such claim and shall make such revision in the final quantities as the Engineer may find to be due and shall then make and issue a final written estimate. The City will pay the amount due, after deducting all previous payments, if any, and amounts to be retained under the provisions of the Contract.

Any and all prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The final estimate shall be conclusive and binding against both parties to the Contract on all questions relating to the performance of the Contract and the amount of work done thereunder and compensation therefor, except in the case of gross error.

9-1.17D(3) Final Determination of Claims: Claims filed by Contractor shall be in sufficient detail to enable the Engineer to determine the basis and amount of the Claims. Contractor shall also furnish reasonable documentation to the City to support Claims. If additional information is required by the Engineer, Contractor shall provide such information to the Engineer no later than the 15th day after receipt of the written request from the Engineer. If the 15th day falls on a weekend, holiday, or day City offices are closed, then the information shall be provided to the Engineer no later than close of the next business day. Failure to submit the requested information to the Engineer within the time specified will be sufficient cause for denying the Claim.

Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated Claim investigator or auditor shall have access to those records and any other records as may be reasonably required by the Engineer to determine the facts or contentions in each Claim. Failure to grant access to such records shall be sufficient cause for denying the Claims.

9-1.22 Arbitration: Any references to Arbitration in the Standard Specifications are deleted in their entirety.

Claims submitted by Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code sections 12650 *et seq*., the undersigned,

_____,
(Name)

_____ of
(Title)

_____
(Contractor)

hereby certifies that the claim for additional compensation made herein is supported by a true statement of the actual costs incurred and time expended on this project and is fully documented by records maintained by Contractor.

Dated _____

/s/_____

Subscribed and sworn before me this _____ day of

_____

_____
Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead expenses, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the City at its discretion.

Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by Contractor's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.

City of Santa Rosa

TECHNICAL SPECIFICATIONS

FOR

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

CONTRACT NO. **C02270**

May 2020

05/04/2020

carollo

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes Identification and summary description of the Project, the Work, location, activities by others, coordination, and early occupancy by Plant staff.

B. Related section:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 01140 - Work Restrictions.

1.2 THE PROJECT

A. The Work described as Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements, includes, but not limited to the following:
   1. The City will isolate the influent diversion box and the Contractor shall lock the influent discharge structure slide gate closed. Contractor shall barricade the emergency storage basins with signs and caution tape to prevent waste haulers from discharging to the basins which drains to the box. Contractor shall plug the pipe from Manhole No. 2, preventing incoming air from Manhole No. 2.
   2. Cleaning the diversion box as necessary for gate replacement, rehabilitation and coating work.
   3. Replacement of the diversion box sluice gate as shown on the demolition and mechanical drawings with a new gate as specified in Section 11294.
   4. Protective coating and concrete repair of the diversion box after the gate replacement as specified in Section 09998.
   5. Contractor shall isolate the waste hauler station from all incoming fluids. This includes contractor placing barricades with signs and caution tape preventing tanker trucks from discharging their contents into the station and directing them to discharge into the emergency holding basin.
   6. Cleaning the waste hauler station vault as necessary for rehabilitation and coating work.
   7. Protective coating and concrete repair of the waste hauler vault.
   8. Repair and reconstruction of existing improvements damaged by the Work, and incidentals for complete and usable facility.

B. Payment will be made at the contract lump sum price, which shall include full

compensation for furnishing all labor, materials, tools and equipment, utilities required for construction, temporary facilities including sheeting and shoring, traffic control, and all other facilities and services necessary for proper execution and the construction of the Laguna Treatment Plant Influent Diversion Box Gate and Coating Improvements work.

C. Comply with codes, ordinances, regulations, orders, and other legal requirements of public authorities having bearing on the performance of the Work.

1.3 LOCATION OF PROJECT

A. The Work is located at City of Santa Rosa, Laguna Treatment Plant (LTP), located at 4300 Llano Road, Santa Rosa, CA 95407.

1.4 ACTIVITIES BY OTHERS

A. Plant staff, utilities, and others may perform activities within Project area while the Work is in progress:
   1. Schedule the Work with Plant staff, utilities, and others to minimize mutual interference.

B. Activities by others which may affect performance of work include:
   1. Normal daily operation of the wastewater treatment plant by staff including maintenance and operation.

C. Cooperate with others to minimize interference and delays:
   1. When cooperation fails, submit recommendations and perform Work in coordination with work of others.

D. When the Work depends on proper execution or results upon work performed by others, inspect and promptly report apparent discrepancies or defects in work performed by others:
   1. Assume responsibility for work performed by others, except for defects reported as specified in this paragraph and defects, which may become apparent in work performed by others after execution of the Work.

1.5 COORDINATION OF WORK

A. Maintain overall coordination of the Work.

B. Obtain construction schedules from each subcontractor, and require each subcontractor to maintain schedules and coordinate modifications.

C. Coordinate with Laguna Treatment plant staff.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01140

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Requirements for sequencing and scheduling the Work affected by existing site and facility, work restrictions, and coordination between construction operations and plant operations.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 01110 - Summary of Work.

1.2 SUBMITTALS

A. Baseline Schedule with SRP tasks.

B. Shutdown Request Procedure (SRP) Form.

C. Shutdown Request Procedure (SRP) Log.

D. Progress Schedule with SRP tasks.

1.3 GENERAL CONSTRAINTS ON SEQUENCE AND SCHEDULING OF WORK

A. Wastewater projects:
   1. The Laguna Treatment Plant (LTP) is the City of Santa Rosa's only means of treating domestic and industrial wastewater prior to discharging to reuse system or surface discharge. Impairing the operational capabilities of this treatment plant will result in serious environmental damage and monetary fines.
   2. Conduct Work in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to treat the quality of raw wastewater to the water quality limitations specified in the discharge permit.
   3. The status of the treatment plant shall be defined as "operational" when it is capable of treating the entire quantity of wastewater received to the water quality limits specified in the discharge permit.

B. Work sequence and constraints:

1. Utilize description of critical events in work sequence in this Section as a guideline for scheduling and undertaking the Work.
2. Work sequence and constraints presented do not include all items affecting completion of the Work, but are intended to describe critical events necessary to minimize disruption of the existing facilities and to ensure compliance with National Pollutant Discharge Elimination System permit requirements.

C. Dry weather is defined as April 15th to October 15th each year.

D. Reference to days in the work restrictions shall be defined as calendar days.

1.4 SHUTDOWN AND CONSTRUCTION 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 in a minimum number of shutdowns.
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 sequencing 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 Engineer.
9. Engineer maintains the ability to abort on the day of the scheduled shutdown.

B. General maximum plant flow work limitations:
1. Activities that disrupt plant operations are prohibited during the following flow conditions, unless otherwise approved in writing by the Engineer:
a. Flow condition: Wet weather flows greater than 20 million gallons per day (mgd).

C. Unit process availability work limitations:
1. Shutdowns and tie-ins or other activities that disrupt plant operations are prohibited unless the following unit process availability conditions exist and unless otherwise approved in writing by the Engineer.

D. Shutdown activities:
1. Scheduling:
a. Perform between the hours of 2 a.m. and 8 a.m. or as directed by Engineer.
2. Unplanned shutdowns due to emergencies are not indicated in this Section.

E. Dewatering of existing process and disposal of residue:
1. When the Plant has turned the process unit over to the Contractor for modification or temporary use, the Contractor is responsible for costs and procedures required to dewater and dispose of liquid, solids, etc. in the process unit, as noted below:

a. Plant will drain and dewater tanks, as much as possible.
b. Drainage and disposal of process unit liquids, solids, etc. into another treatment process unit on the plant site may be allowed if approved in advance by the Engineer, and is conducted in accordance with Engineer's requirements.
c. Costs for dewatering, disposal of solids and residuals, and preparation of surfaces for the Work are Contractor's responsibility:
    1) Includes tipping fees for the removal and disposal of the grit/debris.
d. Dewatering of grit/debris to meet landfill requirements is the responsibility of the Contractor.
e. Contractor shall provide adequate time in schedules for draining and cleanup of basins and channels.

F. Process area construction constraints:
1. The following sequences and constraints shall be observed while working in and around each of the following process areas:
    a. High Strength Receiving Facility:
        1) Maintain access for the equipment to be operated.
    b. The use of tanker trucks that may utilize roadway adjacent to project work area.
    c. Material hauling operations:
        1) Contractor shall comply with restrictions regarding Contractor's use of site and premises as specified in Section 01110.
        2) Chemical deliveries may be made to the existing ferric chloride system, located to the North of the project work area.
        3) Waste hauler deliveries to the existing high strength receiving facility, unless modified herein.

1.5 SHUTDOWN REQUEST PROCEDURE (SRP)

A. SRP Instructions: See Appendix A, attached at the end of this Section.

B. Prepare SRP for the following conditions:
1. Shutdowns, diversions, and tie-ins to the existing facility.
2. Process start-up activities.
3. Power interruption and tie-ins.
4. Switch over between temporary and permanent facilities, equipment, piping, and electrical and instrumentation systems.
5. Process constraints requiring interruption of operating processes or utilities.
6. Road closures.

C. Other Work not specifically listed may require SRPs as determined necessary by the Contractor, or Engineer.

D. Submit Baseline Schedule, as specified in Section 01324C, with proposed SRPs.

E. Submit SRP Log at construction progress meetings.

F. No consideration will be given to claims of additional time and cost associated to preparing SRPs required by the Engineer to complete this work in a manner that facilitates proper operation of the facility and compliance with effluent discharge

criteria.

G. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices throughout the project duration regardless of whether there are active construction activities or not.

1.6 COMPLIANCE WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

A. The existing facility is operating under the terms of a National Pollutant Discharge Elimination System permit issued by the Regional Water Quality Control Board. This permit specifies the water quality limits that the plant must meet prior to discharge of effluent. A copy of the existing permit is on file for review at the treatment plant administrative office.

B. Perform work in a manner that will not prevent the existing facility from achieving the finished water quality requirements established by regulations.

C. Bear the cost of penalties imposed on the Engineer for discharge violations caused by actions of the Contractor.

1.7 REQUIREMENTS FOR OPERATION OF PLANT AND MAINTAINING CONTINUOUS OPERATION OF EXISTING FACILITIES

A. Facilities or conditions required to keep the existing plant operational include, but are not limited to, the following:
   1. Electrical power including transformers, distribution wiring, and motor control centers.
   2. Piping for conveyance of wastewater, chemical or water.
   3. Chemical storage, metering, conveyance, and control facilities.
   4. Plant water system.
   5. Plant air.
   6. Laboratory facilities.
   7. Office, toilets, and washrooms.
   8. Fencing and gates.
   9. Lighting.
   10. Heating, ventilation, and air conditioning.
   11. Instrumentation, meters, controls, and telemetry equipment.
   12. Safety equipment and features.
   13. Parking for Engineer employees and vehicles required for operation and maintenance of the plant.
   14. Storm drainage.
   15. Potable Water.
   16. Natural gas service.
   17. Sludge hauling trucks.
   18. Chemical delivery trucks.
   19. Waste hauling trucks.

B. Conduct the Work and provide temporary facilities required to keep the existing plant continuously operational.

C. Do not remove or demolish existing facilities required to keep the existing plant operational at the capacities specified until the existing facilities are replaced by temporary, new, or upgraded facilities or equipment:

1. Test replacement facilities to demonstrate operational success prior to removing or demolishing existing facilities.

1.8 OPERATIONS AND MAINTENANCE ACCESS

A. Provide safe, continuous access to process control equipment for plant operations personnel.

1.9 UTILITIES

A. New yard utilities were designed using existing facility drawings:
1. Field verification of utilities locations was not performed during design.
2. Services crossed or located nearby by new yard utilities may require relocation and possible shutdowns.
3. Pipe alignments as indicated on the Drawings.

1.10 COORDINATION OF WORK

A. Maintain overall coordination of the Work.

B. Obtain construction schedules from subcontractors and suppliers and assume responsibility for correctness.

C. Incorporate schedules from subcontractors and suppliers into Progress Schedule to plan for and comply with sequencing constraints.

1.11 WORK BY OTHERS

A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.12 WORK SEQUENCE AND CONSTRAINTS

A. General:
1. The Suggested Work Sequence and Constraints presented herein do not necessarily include all items affecting the completion of the Work but are intended to describe in general the critical events necessary to minimize disruptions of the existing facilities and to ensure compliance with the NPDES permit requirements. Utilize the description of critical events in the Work Sequence and Constraints in this Section as a guideline for scheduling and completing the Work. Additional Constraints may be imposed during the Work depending on Contractor's sequence of work.
2. No more than one process, piping system, or electrical system may be removed from service at any one time, unless indicated otherwise by the Engineer.
3. Any element not listed herein but requiring a shutdown or closure (including road closures) shall have maximum shutdown duration of 4 hours for planning

purposes. Once these unforeseen shutdowns have been identified, confirm allowed shutdown durations with Engineer prior to starting the work.

4. Unless noted otherwise or as determined by the Engineer, the term "Substantially Complete" referenced in this Section for any item shall be defined as when structural, mechanical, HVAC, electrical, instrumentation, and

   other incidental Work necessary to render that item of Work complete and ready for operation by the Engineer at the Engineer's discretion.
5. Unless indicated otherwise, provide 14 days written notice, 3 days written confirmation, and a 24-hour final written notice to the Engineer for review and acceptance prior to: (a) beginning demolition of each existing tank, structure, or equipment; (b) draining a tank or structure prior to beginning work adjacent to or inside that tank or structure:
   a. The 3 days written confirmation shall be accompanied with a completed Shutdown Request Form (Appendix A) to be filled out by the Contractor.
   b. The 24-hour final written notice shall also identify any major deviations, if any, to the Shutdown Request. Major deviations that cannot be reasonably accommodated by Engineer may result in denial of the Shutdown Request, and any costs associated with delays that occur as a result of this denial shall be borne solely by the Contractor.
6. Temporary Safety measures: Provide guardrail, lighting, ventilation, and other temporary facilities required for plant staff to safely operate and maintain the LTP facility for the duration of the construction.

B. Key Project Elements – Sequence Constraints:
   1. Contractor shall submit a demolition plan and sequence with his preliminary schedule submittal that follows the constraints outlined herein. Plan and sequence shall be submitted within 5 days of Notice to Proceed, review by Engineer shall be shown as 5 days in schedule, and accepted prior to the start of any demolition work. Only temporary facility installation may proceed after Notice to Proceed is provided by Engineer, prior to demolition plan approval.
   2. Influent Diversion Box Sluice Gate Replacement and Coating Improvements – Specific Constraints and Restriction for the replacement of existing sluice gate and coating improvements are outlined below:
      a. Contractor shall field verify the details of the existing sluice gate installation within 15 days of Notice to Proceed.
      b. Contractor shall submit detailed shop drawings for the sluice gate replacement including gate, connection to existing wall sleeve and replacement operator within 15 days of Notice to Proceed, in order to have gate, operator and accessories fabricated and procured for installation as noted below.
      c. Demolition and gate replacement shall be completed as follows:
         1) Influent Diversion Box inspection with plant staff and Engineer shall be completed within 15 days after Notice to Proceed.
         2) Influent Diversion Box Sluice Gate demolition shall be completed within 30 days of Notice to Proceed.
         3) Influent Diversion Box protective coating and concrete repair shall be completed within 20 days of gate replacement demolition.
         4) Influent Diversion Box Sluice Gate replacement shall be completed no later than October 15, 2020 at the latest.
         5) Sluice gate operation and testing shall be verified by Contractor and

Engineer prior to October 15, 2020.

3. Waste Hauler Vault Coating Improvements - Specific Constraints and Restriction for the waste hauler vault repair and coating are outlined below:
   a. Waste hauler vault repair and coating must be completed after the influent diversion box protective coating and concrete repair, and by October 15, 2020.
4. Specific responsibilities for this work are outlined below:
   1) Plant will isolate influent diversion box prior to demolition.
   2) Plant will replumb south screen washer drain prior to work in the diversion box.
   3) Contractor shall verify the box and waste hauler vault are isolated.
   4) Contractor shall be responsible for draining (or venting) prior to demolition.
   5) Contractor shall be responsible for cleaning influent diversion box and waste hauler vault.
   6) The diversion box and waste hauler vault are classified as a confined space, and confined space procedures shall be followed for all work with in both structures.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

APPENDIX A
"Shutdown Request Procedure" (SRP)
Instructions and Forms

Definition and Purpose

"Shutdown Request Procedure (SRP)" is a detailed document submitted by the Contractor to request process shutdown(s), utility tie-in(s), work in areas that may risk unanticipated outages, or flow diversions to accommodate site construction activities during a project. Such activities may include (but are not limited to) new tie-ins to utilities or structures, mechanical modifications to process piping or equipment, demolition, bulkhead installation, and cleaning processes.

The SRP provides a detailed plan to the Engineer and Engineer that describes specific aspects of the work including purpose, time of execution, and anticipated impacts on treatment processes. The SRP also includes contingency measures and provisions for rapid closure in the event that shutdown or work progress difficulties are encountered. Information from relevant trades associated with the requested shutdown, diversion, or tie-in is also included.

The Engineer should use the information within the SRP to define operational procedures and methods to safely and successfully assist the Contractor.

SRP Process Summary

WHO	STEP	TIMING
Contractor	1. Identify SRPs needed on SRP Log and Baseline Schedule.	7 days prior to Preconstruction Scheduling Meeting.
Contractor, Engineer, Engineer	2. Pre-SRP Meeting.	More than 28 days prior to work.
Contractor	3. Submits SRP.	No later than 28 days prior to work.
Engineer	4. Reviews SRP.	
Engineer	5. SRP finalized.	7 days prior to work.
Contractor	6. Complete Readiness Checklist.	5 days prior to work.
Contractor	7. Complete Safety Checklist.	Just prior to commencing work.
Contractor	8. Complete Work.	
Contractor	9. Update SRP Log and Progress Schedules.	Monthly.

SRP Process Detail

STEP 1. Identifies SRPs needed on SRP Log and Baseline Schedule.

Contractor submits a preliminary list of anticipated project SRPs on SRP Log. SRPs identified but not limited to those shutdowns, diversions, or tie-ins described in the Contract Documents. Incorporate SRPs as tasks in Baseline Schedule. Date scheduled SRPs to coincide with the appropriate construction activities.

STEP 2. Pre-SRP Meeting.

Contractor requests a Pre-SRP Meeting with the Engineer and Engineer to discuss the nature of the shutdown, diversion, or tie-in, and to gather the information necessary to complete the SRP Form. The pre-SRP meeting may be waived by the Engineer or Engineer if the work is deemed to be minor.

STEP 3. Submits SRP.

Contractor completes the SRP Form and submit 3 copies for approval to the Engineer's Project Manager (OPM).

STEP 4. Reviews SRP.

OPM distributes SRP Form for review by the Engineer's Construction Coordinator, O&M Representative, and Engineer's Project Representative. Review SRP Form for completeness, accuracy, compliance with both the construction schedule, constraints defined in contract documents, and to ensure that the requested work does not negatively impact plant operations or other concurrent project activities. Additional information may be requested to better understand the nature of and method for completing the Work.

STEP 5. SRP finalized.

Once the SRP is agreed to by all parties, the SRP will be finalized by signature. Copies are distributed to the Engineer, and Contractor.

STEP 6. Complete Readiness Checklist.

Contractor verifies everything is ready for the work.

STEP 7. Complete Safety Checklist.

Contractor ensures safety.

STEP 8. Complete work.

Contractor complete work.

STEP 9. Update SRP Log and Progress Schedules.

Contractor updates SRP Log weekly and distributes at the regularly scheduled construction progress meetings.

SHUTDOWN REQUEST PROCEDURE (SRP) FORM

Engineer: City of Santa Rosa Date:

Contractor: City Contract No.: C02270

Project Name: Laguna Treatment Plant - Influent Diversion Box Gate Replacement and Coating Improvements Submittal No.:

Submittal Title: Spec/Dwg. Reference:

SRP #	Task Title *(Provide <10 word title)*:	Submittal Date: *(No later than 28 days prior to work)*

SCHEDULE OF WORK ACTIVITY START: *(Date/Time)* END: (Date/Time)

REQUESTOR:

PRIMARY POINT OF CONTACT: PHONE/PAGER:

SECONDARY POINT OF CONTACT: PHONE/PAGER:

NOTIFY ☐ Control Room, Phone ☐ Security, Phone

BUILDING: LOCATION OF WORK FLOOR/LEVEL:

DESCRIPTION OF WORK: *(Provide sufficient details on process isolation, work sequencing, and safety (i.e., control of significant hazards unique to the work) to demonstrate an understanding of the work and how it will be completed within the constraints, and its impact on the processes and facility.)*

Task Summary:

Processes Affected:

Trades Affected:

WORK PLAN:

Work Sequencing:

Process Isolation:

Spill Prevention Plan:

Contingency Plans:

CRITICAL EQUIPMENT/TOOLS: *(pumps and discharge hoses with correct fittings, blind flanges and pipe plugs, no-hub fittings, properly sized electrical service components, generators, portable lighting, chlorine for potable water pipe breaks, etc.)*

☐	Acoustic Ceiling/or Walls Access	☐	Excavation Permit	☐	Lock Out/Tag Out
☐	Chemical Use Approval	☐	Fire Sprinkler Impairment	☐	Life Safety Systems
☐	Confined Space Permit	☐	Flammable Materials	☐	Roof Protocol
☐	Critical Lift Plan	☐	Flush / Discharge	☐	Work After Dark
☐	Energized Electrical Work	☐	High Pressure Test	☐	
☐	Elect. Panel Schedules	☐	Hot Work/Open Flame	☐	

EXISTING SERVICE(S) AT RISK:

☐	Breathing Air	☐	Elect Normal	☐	Process Access	☐	Telephones
☐	Chemical Distribution	☐	Fire Protection	☐	Safety Showers	☐	UPS
☐	City Water	☐	HVAC	☐	SCADA	☐	VAX/DATA
☐	Communication	☐	Inert Gas	☐	Security	☐	
☐	Domestic Drain	☐	Instrument - Air	☐	Solvent Drain	☐	
☐	Elect-Bus Duct	☐	Life Safety System	☐	Specialty Gases	☐	
☐	Elect Emergency	☐	Natural Gas	☐	Storm Drain	☐	

REVIEWER'S INSTRUCTIONS / COMMENTS:

☐ PREJOB BRIEFING MUST BE COMPLETED PRIOR TO COMMENCING WORK:

	Full Name (printed)	Signature	Phone	Date
Submitted By				
System Engineer				
Reviewer (if needed)				
Reviewer (if needed)				
Reviewer (if needed)				
Reviewer (if needed)				

READINESS CHECKLIST
(5 days prior to work)

Checklist provided as a guide but is not all inclusive.

1. Confirm all parts and materials are on site: _____
   _____
2. Review work plan: _____
   _____
3. Review contingency plan: _____
   _____

SAFETY CHECKLIST
(Just prior to commencing work)

Checklist provided as a guide but is not all inclusive.

1. Location awareness:
   a. Emergency exits: _____
   b. Emergency shower and eyewash: _____
   c. Telephones and phone numbers: _____
   d. Shut-off valve: _____
   e. Electrical disconnects: _____
2. Inspect work area:
   a. Take time to survey the area you are working in. Ensure that what you want to do will work. Do you have enough clearance? Is your footing secure? Do you have adequate lighting and ventilation? Are surrounding utilities out of the way for you to perform your work?
3. MSDS (Material Safety Data Sheets):
   a. Understand the chemicals and substances in the area you are working in by reading the MSDS.
4. Lockout/Tagout Procedure:
   a. Lockout/tagout energy sources before beginning work.
   b. Make sure all valves associated with the work are locked out and tagged out on each side of the penetration.
   c. Make sure the lines are depressurized.
   d. Make sure all signs & caution tape are setup to direct the waste hauler truck drivers to discharge into the correct locations.
5. Overhead work:
   a. Use appropriate personal protective equipment; i.e., safety harness, lifeline, etc.
   b. Select appropriate tie-off points; i.e., structurally adequate, not a pipe or conduit, etc.
   c. Spotter assigned and in position.
   d. Pipe rack access; i.e., check design capacity, protective decking or scaffolding in place, exposed valves or electrical switches identified and protected.
6. Safety equipment:
   a. Shepherd's hook.
   b. ARC flash protection.
   c. Fire extinguisher.
   d. Other: _____.
7. Accidents:
   a. Should accidents occur, do not shut off and do not attempt to correct the situation, unless you are absolutely positive that your action will correct the problem and not adversely affect other people or equipment.
8. Review process start-up documents:
   a. In the event the system is shutdown, the Control Center should have a working knowledge of the process start-up procedures in order to deal effectively with unforeseen events.
9. Evacuation procedures:
   a. Do not obstruct evacuation routes.
   b. Take time to survey the area for evacuation routes.

Shutdown Request Procedure (SRP) Log
Sample

SRP Number	Task Title	Date Requested	Date Approved	Date Work Planned	Work Completed (yes/no)
001					
002					
003					

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Requirements and procedures for submittals.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 01770 - Closeout Procedures.

1.2 DEFINITIONS

A. Certificates: Describe certificates that document affirmations by the Contractor or other entity that the work is in accordance with the Contract Documents.

B. Extra stock materials: Describe extra stock materials to be provided for the Engineer's use in facility operation and maintenance.

C. Maintenance material submittals: Use this article to categorize maintenance materials submittals requiring no A/E action other than confirmation of receipt under an explanatory heading.

D. Manufacturer's instructions: Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; manufacturer's instructions are not prepared especially for the Work.

E. Product data: Product data usually consists of manufacturers' printed data sheets or catalog pages illustrating the products to be incorporated into the project.

F. Samples: Samples are full-size actual products intended to illustrate the products to be incorporated into the project. Sample submittals are often necessary for such characteristics as colors, textures, and other appearance issues.

G. Spare parts: Describe spare parts necessary for the Engineer's use in facility operation and maintenance; identify the type and quantity here, but include the actual characteristics of the spare parts in Product as part of the specification of the product.

H. Shop drawings: Shop drawings are prepared specifically for the project to illustrate

details, dimensions, and other data necessary for satisfactory fabrication or construction that are not shown in the contract documents. Shop drawings could include graphic line-type drawings, single-line diagrams, or schedules and lists of products and their application.

I. Submittals: Submittals are samples, product data, shop drawings, and others that demonstrate how Contractor intends to conform with the Contract Documents.

J. Tools: Tools are generally defined as items such as special wrenches, gauges, circuit setters, and other similar devices required for the proper operation or maintenance of a system that would not normally be in the Engineer's tool kit.

1.3 GENERAL INSTRUCTIONS

A. Provide submittals that are specified or reasonably required for construction, operation, and maintenance of the Work.

B. Provide submittal information from only 1 manufacturer for a specified product. Submittals with multiple manufacturers for 1 product will be rejected without review.

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 1 submittal per specification section, but a single submittal may not cover more than 1 specification section.
   2. The only exception to this requirement is when 1 specification section covers the requirements for a component of equipment specified in another section.
   3. 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. Edit all submittals so that the submittal specifically applies to only the equipment furnished. Neatly cross out all extraneous text, options, models, etc. that do not apply to the equipment being furnished, so that the information remaining is only applicable to the equipment being furnished.

E. Prepare submittals in the English language. Do not include information in other languages.

F. Present measurements in customary American units (feet, inches, pounds, etc.).

G. Show dimensions, construction details, wiring diagrams, controls, manufacturers, catalog numbers, and all other pertinent details.

H. Indicate project designated equipment tag numbers from P&IDs for submittal of devices, equipment, and assemblies.

I. Submittals in electronic media format:
   1. General: Provide all information In PC compatible format using Windows operating system as utilized by the Engineer.
   2. Text: Provide text documents and manufacturer’s literature using current

version of Adobe Acrobat (i.e. PDF extension) as utilized by the Engineer.

3. Graphics: Provide all graphic submittals (drawings, diagrams) utilizing current version of Adobe Acrobat (i.e. PDF extension) as utilized by the Engineer.
4. Contractor using other software shall be required to provide to the Engineer conclusive evidence of 100 percent data transfer compatibility.
5. Must be clear and legible, and of sufficient size for presentation of information:
   a. Minimum page size will be 8 1/2 inches by 11 inches.
   b. Maximum page size will be 11 inches by 17 inches.

1.4 SUBMITTAL ORGANIZATION

A. Fully indexed with a tabbed divider for every component.

B. 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.

C. Organize submittals in exactly the same order as the items are referenced, listed, and/or organized in the specification section.

D. 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.

E. Consolidate electronic format submittals with multiples pages into a single file.

1.5 SUBMITTAL COVER SHEETS

A. Submittal Transmittal Form is provided in Appendix A of this Section:
   1. Substitute forms require Engineer approval based on forms providing the same information, statements, and certifications.
   2. Submittal Number Field: Required submittal numbering format: A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: “XXX”: where “XXX” is the sequential number assigned by the Contractor. Resubmittal shall have the following format: ”XXX-Y”: where “XXX” is the originally assigned submittal number and the “Y” is a sequential letter assigned for resubmittals, i.e., A, B, or C being 1st, 2nd, and 3rd resubmittals, respectively. Submittal 025-B for example is the second resubmittal of submittal 25.
   3. “From” Field: Provide name and address of company responsible for preparation of submittal. This could be General Contractor, subcontractor, supplier, manufacturer, etc.
   4. “General Contractor Reviewer” Field: Verify that the General Contractor has reviewed the submittal by signature.

B. Contractor sign and date submittals indicating review and approval:
   1. Signature indicates Contractor certifies that they have satisfied submittal review responsibilities and constitutes Contractor's written approval of submittal.
   2. Submittals without Contractor's signature will be returned to the Contractor un-reviewed. Subsequent submittal of this information will be counted as the first

resubmittal.

C. Attachments:
   1. Specification section: Include with each submittal a copy of the relevant specification section, including relevant addendum updates:
      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. Drawings: 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.

D. 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 Contract Documents and actual field conditions.

1.6 SUBMITTAL CONTENT

A. Shop Drawings:
   1. Contractor to field verify elevation, coordinates, and pipe material for pipe tie-in prior to the preparation of shop drawings.
   2. Details:
      a. Fabrication drawings: drawn to scale and dimensioned.
      b. Front, side, and, rear elevations, and top and bottom views, showing all dimensions.
      c. Locations of conduit entrances and access plates.
      d. Component layout and identification.
      e. Weight.
      f. Finish.
      g. Temperature limitations, as applicable.
      h. Nameplate information.

B. Product Information:
   1. Product Data:
      a. Details:
         1) Supplier name and address.
         2) Subcontractor name and address.
      b. Include:
         1) Catalog cuts.
         2) Bulletins.
         3) Brochures.

4) Manufacturer's Certificate of Compliance: signed by product manufacturer along with supporting reference data, affidavits, and tests, as appropriate.
5) Manufacturer's printed recommendations for installation of equipment.
6) Quality photocopies of applicable pages from manufacturer's documents.

2. Completely fill out a Motor Data Sheet, as specified in Section 16222, for every motor furnished:
   a. Submit one copy of the Motor Data Sheet to the Engineer for review as part of the associated equipment submittal.
3. Samples:
   a. Details:
      1) Submit labeled samples.
      2) Samples will not be returned.
      3) Provide samples from manufacturer's standard colors, materials, products, or equipment lines:
         a) Clearly label samples to indicate any that represent non-standard colors, materials, products, or equipment lines and that if selected, will require an increase in Contract Time or Contract Price.
4. Minor or incidental products and equipment schedules:
   a. Details:
      1) Shop Drawings of minor or incidental fabricated products will not be required, unless requested.
      2) Submit tabulated lists of minor or incidental products showing the names of the manufacturers and catalog numbers, with Product Data and Samples as required to determine acceptability.

C. Design calculations:
   1. Details:
      a. Defined in technical sections.
      b. Calculations must bear the original seal and signature of a Professional Engineer or Structural Engineer where required licensed in the state where the project is located and who provided responsible charge for the design.

D. Qualifications Statements:
   1. Details:
      a. Defined in technical sections.
      b. Licensing documentation.
      c. Certification documentation.
      d. Education documentation.

E. Quality assurance/control submittals:
   1. Mill test reports:
      a. Details:
         1) Submit certified copies of factory and mill test reports.
         2) Do not incorporate Products in the Work which have not passed testing and inspection satisfactorily.
         3) Pay for mill and factory tests.
   2. Test reports:

a. Details:
    1) Include the following information:
        a) A description of the test.
        b) List of equipment used.
        c) Name of the person conducting the test.
        d) Date and time the test was conducted.
        e) Ambient temperature and weather conditions.
        f) All raw data collected.
        g) Calculated results.
        h) Clear statement if the test passed or failed the requirements stated in Contract Documents.
        i) Signature of the person responsible for the test.

3. Factory Acceptance Test:
    a. Details: Include complete test procedure and all forms to be used during test.
4. Certificates:
    a. Details: Defined in technical sections.
5. Manufacturers' field reports:
    a. Details: Certificate of proper installation.
6. Test Plans:
    a. Details: Defined in technical sections.

F. Project management submittals:
1. Applications for payment.
2. Schedule.
3. Shutdown, testing and other operation submittals.
    a. Lock out / Isolation plan for each phase of work.
    b. Testing plan for diversion box, including gate leakage (water) test.

1.7 SUBMITTAL PROCEDURE

A. Contractor: Email submittal to City designated construction manager:
1. Provide PDF document submittal as below:
2. Timeliness: Schedule and make submissions in accordance with the requirements of the individual specification sections and in such a sequence as to cause no delay in Work.
3. Contractor assumes risk of expense and delays when proceeding with work related to required submittals without review and acceptance.

B. 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 Contract Documents or Laws and Regulations.
    b. Engineer's review of submittals shall not release Contractor from Contractor's responsibility for performance of requirements of Contract Documents. Neither shall Engineer's review release Contractor from fulfilling purpose of installation nor from 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 Contract Documents.

d. Engineer's review does not extend to:
    1) Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.
    2) Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.
    3) Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.
e. Engineer can accept or reject any exception at their sole discretion.

2. Review timeframe:
    a. Except as may be provided in technical specifications, a submittal will be returned within **14** 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 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.
        2) Engineer's will provide decision on request:
            a) Written agreement by Engineer to reduce submittal review time will be made only for unusual situations.
            b) Written rejection of request.
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 Engineer's failure to return submittal within time indicated and accepted by Engineer.
4. Review responses: 1 copy of submittal will be returned to Contractor with one of the following reviewer's response:
    a. Reviewed: No corrections noted:
        1) Contractor may proceed with the work described in the submittal.
    b. Resubmittal not required: See comments and make corrections noted:
        1) Contractor shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required.
        2) Resubmit only the portion of package necessary to respond to Engineer's comments.
    c. Correct and resubmit: See comments and make corrections noted:
        1) Contractor shall incorporate the review comments into a complete revised package, and resubmit it for review.
    d. Rejected: See comments:
        1) Contractor shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.

e. Receipt acknowledged: Filed for record:
   1) Contractor has no further action required.

C. Contractor: Prepare resubmittal, if applicable:
   1. Clearly identify each correction or change made.
   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 throughout the submittal:
      a. Acceptable responses to 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 Engineer.
      b. Reviews and re-submittals:
         1) Suppliers shall provide re-submittals which include responses to all submittal review comments separately and at a level of detail commensurate with each comment.
         2) Supplier responses shall indicate how the supplier resolved the issue pertaining to each review comment. Responses such as "acknowledged" or "noted" are not acceptable.
         3) Re-submittals 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 re-submittals 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. Re-submittal timeframe:
      a. Contractor shall provide re-submittal within 15 days.
      b. When a re-submittal cannot be returned within the specified period, Contractor shall notify Engineer in writing.
   4. Review costs:
      a. Costs incurred by Engineer as a result of additional reviews of a particular submittal after the second time it has been reviewed shall be borne by Contractor.
      b. Reimbursement to Engineer will be made by deducting such costs from Contractor's subsequent progress payments.

1.8 CLOSEOUT SUBMITTALS

A. Provide closeout submittals as specified in Section 01770.

PART 2 PRODUCTS Not Used.

PART 3 EXECUTION Not Used.

END OF SECTION

APPENDIX A

CONTRACTOR SUBMITTAL TRANSMITTAL FORM

Engineer: **Submittal Number:**

Contractor: **Package Number:**

Date: **Contract Number: C02270**

TO:	
From: Submittal Preparer Name & Phone #	
Contact Person Name & Phone #	
SPECIFICATION NO.	**SUBJECT OF SUBMITTAL / EQUIPMENT SUPPLIER**

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 following deviations (list deviations):

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 accepted 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 01410

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Regulatory authorities and codes.

1.2 AUTHORITIES HAVING JURISDICTION

A. Building Department: City of Santa Rosa.

B. Fire Department: Santa Rosa Fire Department.

1.3 APPLICABLE CODES

A. California Code of Regulations (CCR), California Building Standards Code, CCR Title 24:
   1. Building code:
      a. California Building Code (CBC), Title 24, Part 2 – 2013.
   2. Electrical code:
      a. California Electrical Code (CEC), Title 24, Part 3 – 2013.
   3. Existing building code:
      a. California Existing Building Code (CEBC), Title 24, Part 10 – 2013.
   4. Fire code:
      a. California Fire Code (CFC), Title 24, Part 9 – 2013.
   5. Green building standards code:
      a. California Green Building Standards Code (Cal Green), Title 24, Part 11 – 2013.
   6. Historical building code:
      a. California Historical Building Code (CHBC), Title 24, Part 8 – 2013.
   7. Mechanical code:
      a. California Mechanical Code (CMC), Title 24, Part 4 – 2013.
   8. Plumbing code:
      a. California Plumbing Code (CPC), Title 24, Part 5 – 2013.
   9. Energy code:
      a. California Energy Code (CEC), Title 24, Part 6 – 2013.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01424

ABBREVIATIONS AND ACRONYMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Abbreviations and meanings.

1.2 INTERPRETATIONS

A. Interpret abbreviations by context in which abbreviations are used.

1.3 ABBREVIATIONS

A. Abbreviations used to identify reference standards:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ABC	Associated Air Balance Council
AATCC	American Association of Textile Chemists and Colorists.
ABPA	Acoustical and Board Products Association
ACGIH	American Conference of Government Industrial Hygienists
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ADC	Air Diffusion Council
ABMA	American Bearing Manufacturers' Association (formerly AFBMA, Anti-Friction Bearing Manufacturers' Association)
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturers' Association
AHRI	Air-Conditioning, Heating, and Refrigeration Institute
AI	Asphalt Institute
AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association International, Inc.
AMG	Arizona Masonry Guild
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASAHC	American Society of Architectural Hardware Consultants ASCE American Society of Civil Engineers

ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	ASTM International
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWSC	American Welding Society Code
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America
BSI	Building Stone Institute
Caltrans	California Department of Transportation
Cal-OSHA	California Occupational Safety and Health Administration
CCR	California Code of Regulations
CFR	United States Code of Federal Regulations
CLFMI	Chain Link Fence Manufacturers Institute
CPSC	U.S. Consumer Product Safety Commission
CRA	California Redwood Association
CRI	Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards
CSA	CSA International
CSI	Construction Specifications Institute
CTI	Ceramic Tile Institute
DHI	Door and Hardware Institute
EIFS	Exterior Insulation and Finish System
EJCDC	Engineers Joint Contract Documents Committee
EPA	United States Environment Protection Agency
FDA	Food and Drug Administration
FGMA	Flat Glass Marketing Association
FHWA	Federal Highway Administration
FIA	Factory Insurance Association
FM	FM (Factory Mutual) Global
FS	Federal Specifications
FTI	Facing Tile Institute
GA	Gypsum Association
HI	Hydraulic Institute
HMMA	Hollow Metal Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ICC	International Code Council
ICEA	Insulated Cable Engineer’s Association

IEEE	Institute of Electrical and Electronics Engineers
ISA	International Society of Automation
ISO	International Organization for Standardization
JIC	Joint Industrial Council
MAG	Maricopa Association of Governments
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MS	Military Specifications
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International
NAPA	National Asphalt Pavement Association
NAVFAC	Department of the Navy Facilities Engineering Command
NBHA	National Builders Hardware Association
NCMA	National Concrete Masonry Association
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NETA	International Electrical Testing Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NMWIA	National Mineral Wool Insulation Association
NPCA	National Paint and Coatings Association
NRCA	National Roofing Contractors Association
NSF	NSF International
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturer's Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDCA	Paint and Decorating Contractors of America
PDI	Plumbing and Drainage Institute
PEI	Porcelain Enamel Institute
PS	Product Standard
RCSC	Research Council on Structural Connections
RILEM	International Union of Testing and Research Laboratories for Materials and Structures
RTI	Resilient Tile Institute
SAE	SAE International
SCPA	Structural Clay Products Association
SDI	Steel Door Institute

SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Society for Protective Coatings
TABB	Testing, Adjusting, and Balancing Bureau
TCA	Tile Council of America
UL	Underwriters Laboratories, Inc.
UNS	Unified Numbering System
USDA	United States Department of Agriculture
USACE	U.S. Army Corps of Engineers
VA	Vermiculite Association
WCLA	West Coast Lumberman's Association
WCLIB	West Coast Lumber Inspection Bureau
WPA	Western Pine Association
WPOA	Western Plumbing Officials Association
WRC	Welding Research Council
WSCPA	Western States Clay Products Association
WWPA	Western Wood Products Association

B. Abbreviations used in Specifications and Drawings: a year or years (metric unit)

A	ampere or amperes
am	ante meridian (before noon)
ac	alternating current
ac-ft	acre-foot or acre-feet
atm	atmosphere
AWG	American Wire Gauge
bbl	barrel or barrels
bd	board
bhp	brake horsepower
BIL	basic impulse insulation level
bil gal	billion gallons
BOD	biochemical oxygen demand
Btu	British thermal unit or units
Btuh	British thermal units per hour
bu	bushel or bushels
BV	bed volume(s)
C	degrees Celsius
cal	calorie or calories
cap	capita
cd	candela or candelas
cfm	cubic feet per minute
Ci	curie or curies

CIPP	Cured-in-Place Pipe
cm	centimeter or centimeters
cmu	concrete masonry unit
CO	carbon monoxide
Co.	Company
CO_2	carbon dioxide
COD	chemical oxygen demand
Corp.	Corporation
counts/min	counts per minute
cu	cubic
cu cm	cubic centimeter or centimeters
cu ft	cubic foot or feet
cu ft/day	cubic feet per day
cu ft/hr	cubic feet per hour
cu ft/min	cubic feet per minute
cu ft/sec	cubic feet per second
cu in	cubic inch or inches
cu m	cubic meter or meters
cu yd	cubic yard or yards
d	day (metric units)
day	day (English units)
db	decibels
D/d	column diameter to particle diameter ratio
DB	dry bulb (temperature)
dc	direct current
diam	diameter
DO	dissolved oxygen
DS	dissolved solids
EBCT	empty bed contact time
emf	electromotive force
fpm	feet per minute
F	degrees Fahrenheit
ft	feet or foot
fc	foot-candle or foot candles
ft/day	feet per day
ft/hr	feet per hour
ft/min	feet per minute
ft/sec	feet per second
g	gram or grams
G	gravitational force
gal	gallon or gallons
gal/day	gallons per day
gal/min	gallons per minutes
gal/sec	gallons per second
gfd	gallons per square foot per day
g/L	grams per liter
gpd	gallons per day

gpd/ac	gallons per day per acre
gpd/cap	gallons per day per capita
gpd/sq ft	gallons per day per square foot
gph	gallons per hour
gpm	gallons per minute
gpm/ft^2	gallons per minute per square foot
gps	gallons per second
g/cm^3	grams per cubic centimeter
h	hour or hours (metric units)
ha	hectare or hectares
hp	high point
hp	horsepower
hp-hr	horsepower-hour or horsepower-hours
hr	hour or hours (English units)
Hz	hertz
ID	inside diameter
ihp	indicated horsepower
Inc.	Incorporated
inch	inch
inches	inches
inches/sec	inches per second
J	joule or joules
JTU	Jackson turbidity unit or units
k	kips
K	kelvin
K	thermal conductivity
kA	kiloampere
kcal	kilocalorie or kilocalories
kcmil	thousand circular mils
kg	kilogram or kilograms
kip	kilopound or kilopounds
km	kilometer or kilometers
kN	kilonewton or kilonewtons
kPa	kilopascal or kilopascals
ksi	kips per square inch
kV	kilovolt or kilovolts
kVA	kilovolt-ampere or kilovolt-amperes
kW	kilowatt or kilowatts
kWh	kilowatt hour
L	liter or liters
lb/1000 cu ft	pounds per thousand cubic foot lb/acre-ft pounds per acre-foot
lb/ac	pounds per acre
lb/cu ft	pounds per cubic foot
lb/day/cu ft	pounds per day per cubic foot

lb/day/acre	pounds per day per acre
lb/sq ft	pounds per square foot
L/D Ratio	Ratio of filter height to filter media particle diameter
lin	linear, lineal
lin ft	linear foot or feet
lm	lumen or lumens
lmh	liters per square meter per hour
log	logarithm (common)
ln	logarithm (natural)
lx	lux
m	meter or meters
M	molar (concentration)
mA	milliampere or milliamperes
max	maximum
mCi	millicurie or millicuries
meq	milliequivalent
meq/mL	milliequivalents per milliliter
MFBM	thousand feet board measure
mfr	manufacturer
mg	milligram or milligrams
mgd/ac	million gallons per day per acre
mgd	million gallons per day
mg/L	milligrams per liter
mrem	millirem
μF	microfarad or microfarads
Mil	0.001 inch (used for coating thickness)
mile	mile
mil. gal	million gallons
miles	miles
min	minimum
min	minute or minutes
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	millimeter or millimeters
mol wt	molecular weight
mol	mole
Mpa	megapascal or megapascals
mph	miles per hour
MPN	most probable number
MPT	National Pipe Thread, male fitting
mR	milliroentgen or milliroentgens
Mrad	megarad or megarads
mV	millivolt or millivolts
MW	megawatt or megawatts
μg/L	micrograms per liter
μm	micrometer or micrometers
µS/cm	microSeimens per centimeter
N	newton or newtons
N	normal (concentration)

ND	not detected
No.	number
Nos	numbers
NPT	National Pipe Thread
NRC	noise reduction coefficient NTU or ntu nephelometric turbidity unit
oc	on center
OD	outside diameter
ORP	oxidation-reduction potential
OT	ortho-tolidine
OTA	ortha-tolidine-arsenite
oz	ounce or ounces
oz/sq ft	ounces per square foot
Pa	pascal or pascals
pl	plate or property line
pm	post meridiem (afternoon)
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
pr	pair
psf/hr	pounds per square foot per hour
psf	pounds per square foot
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVC	polyvinyl chloride
qt	quart or quarts
R	radius
R	roentgen or roentgens
rad	radiation absorbed dose
RH	relative humidity
rpm	revolutions per minute
rps	revolutions per second
s	second (metric units)
S	Siemens (mho)
scfh	standard cubic feet per hour
SDI	sludge density index or silt density index
sec	second (English units)
SI	International System of Units
sp	static pressure
sp gr	specific gravity
sp ht	specific heat
sq	square
cm^2 or sq cm	square centimeter or centimeters
sq ft	square feet or foot
sq inch	square inch
sq inches	square inches

km^2 or sq km	square kilometer or kilometers m^2 or
sq m	square meter or meters
mm^2 or sq mm	square millimeter or millimeters
sq yd	square yard or yards
SS	suspended solids
STC	Sound Transmission Class
SVI	sludge volume index
TDS	total dissolved solids
TEFC	totally enclosed, fan-cooled
TKN	total Kjeldahl nitrogen
TLM	median tolerance limit
TOC	total organic carbon
TOD	total oxygen demand
TOW	top of weir
TS	total solids
TSS	total suspended solids
TVS	total volatile solids
U	U Factor/U Value
U	Coefficient of Heat Transfer
U	heat transfer coefficient
UNS	Uniform Numbering System
US	United States
V	volt or volts
VA	volt-ampere or volt-amperes
W	watt or watts
WB	wet bulb
wg	water gauge
wk	week or weeks
WRT	water remediation technologies
wt	weight
yd	yard or yards
yr	year or years (English unit)

C. Abbreviations used on Drawings: As listed on Drawings or in Specifications.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Quality control and control of installation.
   2. Tolerances.
   3. References.
   4. Mock-up requirements.
   5. Authority and duties of Engineer's representative or inspector.
   6. Sampling and testing.
   7. Testing and inspection services.
   8. Contractor's responsibilities.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

H. When specified, products will be tested and inspected either at point of origin or at Work site:
   1. Notify Engineer in writing well in advance of when products will be ready for

testing and inspection at point of origin.

2. Do not construe that satisfactory tests and inspections at point of origin is final acceptance of products. Satisfactory tests or inspections at point of origin do not preclude retesting or re-inspection at Work site.

I. Do not ship products which require testing and inspection at point of origin prior to testing and inspection.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When Manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM): E 329 - Standard for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

B. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

C. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

D. Obtain copies of standards where required by product specification sections.

E. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

1.5 MOCK-UP REQUIREMENTS

A. Tests will be performed under provisions identified in this Section and identified in respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be comparison standard for remaining Work.

D. Where mock-up has been accepted by Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by Engineer.

1.6 AUTHORITY AND DUTIES OF ENGINEER'S REPRESENTATIVE OR INSPECTOR

A. Engineer's Project Representative employed or retained by ENGINEER is authorized to inspect the Work.

B. Inspections may extend to entire or part of the Work and to preparation, fabrication, and manufacture of products for the Work.

C. Deficiencies or defects in the Work which have been observed will be called to Contractor's attention.

D. Inspector will not:
   1. Alter or waive provisions of Contract Documents.
   2. Inspect Contractor's means, methods, techniques, sequences, or procedures for construction.
   3. Accept portions of the Work, issue instructions contrary to intent of Contract Documents, or act as foreman for Contractor. Supervise, control, or direct Contractor's safety precautions or programs; or inspect for safety conditions on Work site, or of persons thereon, whether Contractor's employees or others.

E. Inspector will:
   1. Conduct on-site observations of the Work in progress to assist Engineer in determining when the Work is, in general, proceeding in accordance with Contract Documents.
   2. Report to Engineer whenever Inspector believes that Work is faulty, defective, does not conform to Contract Documents, or has been damaged; or whenever there is defective material or equipment; or whenever Inspector believes the Work should be uncovered for observation or requires special procedures.

1.7 SAMPLING AND TESTING

A. General:
   1. Prior to delivery and incorporation in the Work, submit listing of sources of materials, when specified in sections where materials are specified.
   2. When specified in sections where products are specified:
      a. Submit sufficient quantities of representative samples of character and quality required of materials to be used in the Work for testing or examination.
      b. Test materials in accordance with standards of national technical organizations.

B. Sampling:
   1. Furnish specimens of materials when requested.
   2. Do not use materials which are required to be tested until testing indicates satisfactory compliance with specified requirements.
   3. Specimens of materials will be taken for testing whenever necessary to determine quality of material.
   4. Assist Engineer in preparation of test specimens at site of work, such as soil samples and concrete test cylinders.

C. Testing:
   1. ENGINEER will employ and pay for services of independent testing laboratory to perform routine tests of materials to confirm compliance with requirements of Contract Documents:

a. Mill tests, soil compaction test, and other specified tests shall be paid for by Contractor.

2. When protesting failed tests of material in place or to be used, take additional specimens and have specimens tested:
   a. When original test proves to have been in error, file claim for reimbursement of direct costs for sampling and testing.

D. Test standards:
   1. Perform sampling, specimen preparation, and testing of materials in accordance with specified standards, and when no standard is specified, in accordance with standard of nationally recognized technical organization.
   2. Physical characteristics of materials not particularly specified shall conform to standards published by ASTM, where applicable.
   3. Standards and publication references in Contract Documents shall be edition or revision in effect on date stipulated in the Contract Documents.

1.8 TESTING AND INSPECTION SERVICES

A. Contractor will employ and pay for specified services of an independent firm to perform Contractor quality control testing as required in the technical specifications for various work and materials.

B. Engineer will employ and pay for specified services of an "Engineer's independent testing firm" to perform testing and inspection as required in the technical specifications for various work and materials to confirm Contractor's compliance with Contract Documents. If Engineer independent testing firm is not properly certified to perform specialty inspections required by the building department, Engineer will employ and pay for a quality specialty inspection firm to perform required testing and inspection.

C. The Engineer's independent testing firm will perform tests, inspections and other services specified in individual specification sections and as required by or requested by the Engineer.

D. The qualifications of laboratory that will perform the testing, contracted by the Engineer or by the Contractor, shall be as follows:
   1. Has authorization to operate in the state where the project is located.
   2. Meets "Recommended Requirements for Independent Laboratory Qualification," published by American Council of Independent Laboratories.
   3. Meets requirements of ASTM E 329.
   4. Laboratory Staff: Maintain full time specialist on staff to review services.
   5. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to National Bureau of Standards (NBS) or accepted values of natural physical constants.
   6. Will submit copy of report of inspection of facilities made by Materials Reference Laboratory of NBS during most recent tour of inspection, with memorandum of remedies of deficiencies reported by inspection.

E. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing inspections and source quality control as required by Engineer.

F. Reports will be submitted by Engineer's independent testing firm to Contractor, and Engineer in triplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents. Each report shall include:
   1. Date issued.
   2. Project title and number.
   3. Testing laboratory name, address, and telephone number.
   4. Name and signature of laboratory inspector.
   5. Date and time of sampling or inspection.
   6. Record of temperature and weather conditions.
   7. Date of test.
   8. Identification of product and specification section.
   9. Location of sample or test in Project.
   10. Type of inspection or test.
   11. Results of tests and compliance with Contract Documents.
   12. Interpretation of test results, when requested by Engineer.

G. Contractor shall cooperate with Engineer's independent testing firm, furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested:
   1. Notify Engineer and Engineer's independent testing firm 48 hours prior to expected time for operations requiring testing.
   2. Make arrangements with Engineer's independent testing firm and pay for additional samples and tests required for Contractor's use.

H. Limitations of authority of testing Laboratory: Engineer's independent testing firm or Laboratory is not authorized to:
   1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency or laboratory may not approve or accept any portion of the Work.
   3. Agency or laboratory may not assume duties of Contractor.
   4. Agency or laboratory has no authority to stop the Work.

I. Testing and employment of an Engineer's independent testing firm or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

J. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same Engineer's independent testing firm on instructions by Engineer. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

K. The Engineer's independent testing firm responsibilities will include:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.

6. Perform additional tests required by Engineer.
7. Attend preconstruction meetings and progress meetings.

L. Engineer's independent testing firm individual test reports: After each test, Engineer's independent testing firm will promptly submit copies electronically . When requested by Engineer, the Engineer's independent testing firm will provide interpretation of test results. Include the following:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Certified test results stamped and signed by a registered Engineer in the State of California.
10. Summary of conformance with Contract Documents.

M. Engineer's independent testing firm will provide monthly report of certification to identify all work performed for special inspections and other contract requirements on this project. The following certified monthly report at a minimum will include but not limited to:
1. Results of testing.
2. Testing logs.
3. Outstanding deficiencies.
4. Various statistical data.
5. Testing curves (up to 4 types) as required by the Engineer.

1.9 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with Engineer's independent testing firm or laboratory personnel and provide access to construction and manufacturing operations.

B. Secure and deliver to Engineer's independent testing firm or laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

C. Provide to Engineer's independent testing firm or laboratory and Engineer preliminary mix design proposed to be used for concrete, and other materials mixes which require control by testing laboratory.

D. Furnish electronical copies of product test reports.

E. Furnish incidental labor and facilities:
1. To provide access to construction to be tested.
2. To obtain and handle samples at Work site or at source of product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. Notify Engineer's independent testing firm or laboratory 48 hours in advance of when

observations, inspections and testing is needed for laboratory to schedule and perform in accordance with their notice of response time.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01610

PROJECT DESIGN CRITERIA

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Project design criteria such as temperature and site elevation.

1.2 PROJECT DESIGN CRITERIA

A. All equipment and materials for the project are to be suitable for performance in a wastewater treatment plant environment and under following conditions:
   1. Design temperatures are:
      a. Outdoor temperatures: 32 to 105 degrees Fahrenheit.
      b. Indoor temperatures for the following buildings:
         1) Process areas: 32 to 105 degrees Fahrenheit.
         2) Electrical rooms: 32 to 105 degrees Fahrenheit.
   2. Design groundwater elevation: 4 to 7 feet below grade.
   3. Moisture conditions: Defined in individual equipment sections.
   4. Site elevation: Approximately 85 to 90 feet above mean sea level.
   5. Marine environment with coastal fog and sea salt spray.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Contract closeout requirements including:
   1. Final cleaning.
   2. Waste disposal.
   3. Touch-up and repair.
   4. Disinfection of systems.
   5. Record drawing submittal
   6. Punchlist procedures.
   7. Final completion.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.

1.2 REFERENCES

A. American Water Works Association (AWWA).

1.3 FINAL CLEANING

A. Perform final cleaning prior to inspections for Final Acceptance.

B. Employ skilled workers who are experienced in cleaning operations.

C. Use cleaning materials which are recommended by manufacturers of surfaces to be cleaned.

D. Prevent scratching, discoloring, and otherwise damaging surfaces being cleaned.

E. Clean debris in drainage systems.

F. Broom clean exterior paved surfaces and rake clean other surfaces of site work:
   1. Police yards and grounds to keep clean.

G. Remove dust, cobwebs, and traces of insects and dirt.

H. Clean grease, mastic, adhesives, dust, dirt, stains, fingerprints, paint, blemishes, sealants, plaster, concrete, and other foreign materials from sight-exposed surfaces, and fixtures and equipment.

I. Probes, elements, sample lines, transmitters, tubing, and enclosures have been cleaned and are in like-new condition.

1.4 WASTE DISPOSAL

A. Arrange for and dispose of surplus materials, waste products, and debris off-site:
   1. Prior to making disposal on private property, obtain written permission from Owner of such property.

B. Do not create unsightly or unsanitary nuisances during disposal operations.

C. Maintain disposal site in safe condition and good appearance.

D. Complete leveling and cleanup prior to final acceptance of the Work.

1.5 TOUCH-UP AND REPAIR

A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for Final Acceptance.

B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

1.6 CLOSEOUT DOCUMENTS

A. Submit following Closeout Submittals upon Substantial Completion and at least 7 days prior to submitting Application for Final Payment:
   1. Project Record Documents.
   2. Operation and Maintenance Manuals.
   3. Evidence of Payment and Release of Liens as outlined in Conditions of the Contract.
   4. Release of claims as outlined in Conditions of the Contract.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain at Project site, available to Engineer and Design Engineer, 1 copy of the Contract Documents, shop drawings, and other submittals in good order:
   1. Mark and record field changes and detailed information contained in submittals and change orders.
   2. Record actual depths, horizontal and vertical location of underground pipes, duct banks, and other buried utilities. Reference dimensions to permanent surface features.
   3. Identify specific details of pipe connections, location of existing buried features located during excavation, and the final locations of piping, equipment, electrical conduits, manholes, and pull boxes.
   4. Identify location of spare conduits including beginning, ending, and routing through pull boxes and manholes. Record spare conductors, including number and size,

within spare conduits and filled conduits.

5. Provide schedules, lists, layout drawings, and wiring diagrams.

6. Make annotations in electronic format or hardcopy format with erasable colored pencil conforming to the following color code:

Additions	Red
Deletions	Green
Comments	Blue
Dimensions	Graphite

B. Maintain documents separate from those used for construction:
   1. Label documents "RECORD DOCUMENTS."

C. Keep documents current:
   1. Record required information at the time the material and equipment is installed and before permanently concealing.

D. Deliver Record Documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

E. Record Documents will be reviewed monthly to determine the percent complete for the monthly pay application.

F. During progress meetings, Record Documents will be reviewed to ascertain that changes have been recorded.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PUNCHLIST INSPECTION

A. When each portion of the Work is, in the opinion of the Contractor, complete in all respects, the Contractor shall call for a punch-list inspection.

B. Inspection Procedures: On receipt of a request for inspection, the City's Engineer will schedule the Inspection. The Engineer will then perform a preliminary, walk- through. If, in the judgment of the Engineer, the project is not sufficiently complete in all respects, the Engineer will so advise the Contractor and discontinue the inspection:
   1. The Engineer will repeat inspection when requested and assured that the work has been completed.
   2. Results of the completed inspection will form the basis of requirements for final acceptance punch-list.

3.2 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for certification of acceptance of final completion submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Engineer.

B. Re-inspection Procedure: The Engineer will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, (punch- list), has been completed, except items whose completion has been delayed because of circumstances acceptable to the City:

1. Upon completion of re-inspection, the Engineer will prepare and submit to the City, a recommendation of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final completion. See additional requirements for final completion in the General Specifications.

END OF SECTION

SECTION 03055

ADHESIVE-BONDED REINFORCING BARS AND ALL THREAD RODS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Bonding reinforcing bars and all thread rods in concrete using adhesives as specified.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 01410 - Regulatory Requirements.

1.2 REFERENCES

A. American National Standards Institute (ANSI):
   1. Standard B212.15 - Carbide Tipped Masonry Drills and Blanks for Carbide Tipped Masonry Drills.

B. ASTM international (ASTM):
   1. C 881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

C. ICC Evaluation Service, Inc. (ICC-ES):
   1. AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.

D. Society for Protective Coatings (SSPC):
   1. Surface Preparation Standards (SP):
      a. SP-1 - Solvent Cleaning.

1.3 SUBMITTALS

A. Product Data: Furnish technical data for adhesives, including:
   1. Manufacturer's printed installation instructions (MPII).
   2. Independent laboratory test results.
   3. Handling and storage instructions.

B. Quality control submittals:

1. Adhesive manufacturer's past project experience data on at least 3 similar projects supplied with proposed products within the last 3 years.
2. Special inspection: Provide detailed step-by-step instructions for the special inspection procedure in accordance with the building code as specified in Section 01410.
3. ICC Evaluation Service, Inc., Evaluation Services Report in compliance with the AC308-Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.
4. Installer qualifications: Submit evidence of successful completion of certification program for each installer of work described in this Section.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Installer qualifications:
      a. All individuals performing the work described in this Section shall be certified by a qualified organization to install adhesive anchors by following the MPII. Those organizations deemed to be qualified are:
         1) ACI-CRSI Adhesive Anchor Installer Certification Program.
         2) An adhesive anchor manufacturer’s certification program, subject to acceptance by the Engineer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Storage and protection:
   1. Store adhesives and adhesive components on pallets or shelving in a covered-storage area.
   2. Control temperature above 60 degrees Fahrenheit and dispose of product if shelf life has expired.
   3. If stored at temperatures below 60 degrees Fahrenheit, test components prior to use to determine if they still meet specified requirements.

1.6 PROJECT CONDITIONS

A. Seismic design category: D.

PART 2 PRODUCTS

2.1 GENERAL

A. Like items of materials: Use end products of one manufacturer in order to achieve structural compatibility and singular responsibility.

2.2 ADHESIVE FOR SELF-CONTAINED CARTRIDGE SYSTEM

A. Adhesive shall have a current ICC Evaluation Service report documenting acceptance under AC308 for use with cracked concrete and for the seismic design categories specified.

B. Materials:
   1. In accordance with ASTM C 881, Type IV, Grade 3, Class B or C depending on site conditions.
   2. 2-component, 100 percent solids, insensitive to moisture.
   3. Cure temperature, pot life, and workability: Compatible with intended use and environmental conditions.

C. Packaging:
   1. Furnished in side-by-side cartridges with resin and hardener components isolated until mixing through manufacturer's static mixing nozzle. Nozzle designed to thoroughly blend the components for injection from the nozzle directly into prepared hole.
   2. Container markings: Include manufacturer's name, product name, batch number, mix ratio by volume, product expiration date, ANSI hazard classification, and appropriate ANSI handling precautions.

D. Manufacturers: One of the following or equal:
   1. Hilti, Inc., Tulsa, OK: RE 500-SD.
   2. Simpson Strong-Tie Company, Inc., Pleasanton, CA: SET-XP.

2.3 ALL THREAD RODS

A. All thread rods:
   1. Stainless steel:
      a. Units descaled, pickled, and passivated as specified in "Fabrication" in this Section.
      b. Threaded rods and nuts to be the products of a single manufacturer/fabricator to ensure proper fit without galling. Ship threaded rods with properly fitting nuts attached.
      c. Alloy: Type 316/316L:
         1) Bolts: ASTM A 193, Grade B8M, Class 1, heavy hex.
         2) Nuts: ASTM A 194, Grade 8M, heavy hex.
         3) Washers: Type 316 stainless steel.

2.4 REINFORCING BARS

A. Not Used

PART 3 EXECUTION

3.1 GENERAL

A. Execution of this work is restricted to those installers certified through a qualified certification program described under Quality Assurance and accepted by the Engineer.

B. The work shall be performed in strict accordance with the accepted MPII and the following instructions. Where the accepted MPII and the following instructions

conflict, the MPII shall prevail.

C. Provide adhesive packaged as follows:
   1. Disposable, self-contained cartridge system capable of dispensing multiple adhesive components in the proper mixing ratio, and fit into a manually or pneumatically operated caulking gun.
   2. Dispense components through a mixing nozzle that thoroughly mixes components.

3.2 HOLE SIZING AND INSTALLATION

A. Drilling holes:
   1. Determine location of reinforcing bars or other obstructions with a non-destructive indicator device, and mark locations with construction crayon on the surface of the concrete.
   2. Do not damage or cut existing reinforcing bars, electrical conduits, or other items embedded in the existing concrete without acceptance by Engineer.

B. Hole drilling equipment:
   1. Electric or pneumatic rotary impact type with medium or light impact.
   2. Drill bits: Carbide-tipped in accordance with ANSI B212-15 unless otherwise recommended by the manufacturer or required as a “condition of use” in the ICC Evaluation Report submitted.
   3. Hollow drill bits with flushing air systems are preferred. Air supplied to hollow drill bits shall be free of oil, water, or other contaminants that will reduce bond.
   4. Where edge distances are less than 2 inches, use lighter impact equipment to prevent microcracking and concrete spalling during drilling process.

C. Hole diameter: Reinforcing bar diameter or all thread rod diameter plus 1/8 inch.

D. Obstructions in drill path:
   1. If an existing reinforcing bar or other obstruction is hit while drilling hole, stop drilling hole and fill the hole with drypack mortar. Relocate the hole to miss the obstruction and drill another hole. Repeat the above until the hole has been drilled to the required depth.
   2. Avoid drilling an excessive number of holes in an area of a structural member, which would excessively weaken the structural member and endanger the stability of the structure. Drypack holes which hit obstructions and allow drypack to reach strength equal to the existing concrete before drilling adjacent holes. Epoxy grout may be substituted for drypack when acceptable to Engineer.
   3. When existing reinforcing steel is encountered during drilling and when acceptable to Engineer, enlarge the hole by 1/8 inch, core through the existing reinforcing steel at the larger diameter, and resume drilling at original hole diameter.
   4. Bent bar reinforcing bars: Where edge distances are critical, and striking reinforcing steel is likely, and if acceptable to Engineer, drill hole at 10 degree angle or less from axis of reinforcing bar or all thread rod being installed.

E. Install reinforcing bars and all thread rods to depth, spacing, and locations as indicated on the Drawings:

1. Do not install adhesive-bonded all-thread rods or reinforcing bars in overhead applications.

F. Cleaning holes:
   1. Insert long air nozzle into hole and blow out loose dust. Use compressed air that is free of oil, water, or other contaminants that will reduce bond.
   2. Use a stiff bristle brush to vigorously brush hole to dislodge compacted drilling dust.
   3. Repeat step 1.
   4. Repeat above steps as required to remove drilling dust or other material that will reduce bond. The hole shall be clean and dry.

G. Cleaning reinforcing bars and all thread rods:
   1. Solvent clean reinforcing bar and all thread rods over the embedment length in accordance with SSPC SP-1 Solvent Cleaning. Provide an oil and grease free surface to promote bonding of adhesive to steel.
   2. Clean reinforcing bars and all thread rods over embedment length to bare metal. The reinforcing bars and all thread rods shall be free of oil, grease, paint, dirt, mill scale, rust, or other coatings that will reduce bond.

H. Filling hole with adhesive:
   1. Fill hole with adhesive before inserting the reinforcing bar or all thread rod. Fill hole with adhesive starting from bottom of hole. Fill hole without creating air voids.
   2. Fill hole with sufficient adhesive so that excess adhesive is extruded out of the hole when the reinforcing bar or all thread rod is inserted into the hole.
   3. Do not install adhesive prior to receiving adhesive manufacturer's onsite training.

3.3 MANUFACTURERS' SERVICES

A. Furnish manufacturer's representative to conduct jobsite training for proper installation, handling, and storage of adhesive, for personnel who will perform actual installation. Engineer may attend training sessions.

END OF SECTION

SECTION 03600

GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Cement grout.
   2. Cement mortar.
   3. Dry-pack mortar.
   4. Epoxy grout.
   5. Grout.
   6. Non-shrink epoxy grout.
   7. Non-shrink grout.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. C 109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-inch or 50-millimeter cube specimens).
   2. C 230 - Standard Specification for Flow Table for Use In Tests of Hydraulic Cement.
   3. C 531 - Standard Test Method for Liner Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
   4. C 579 - Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes.
   5. C 939 - Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
   6. C 942 - Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory.
   7. C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
   8. C 1181 - Standard Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts.

B. International Concrete Repair Institute (ICRI):
   1. 310.2R – Selecting and specifying Concrete Surface Preparations for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

1.3 SUBMITTALS

A. Cement grout:
   1. Mix design.
   2. Material submittals.

B. Cement mortar:

1. Mix design.
2. Material submittals.

C. Non-shrink epoxy grout:
1. Manufacturer's literature.

D. Non-shrink grout:
1. Manufacturer's literature.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to jobsite in their original, unopened packages or containers, clearly labeled with manufacturer's product identification and printed instructions.

B. Store materials in cool dry place and in accordance with manufacturer's recommendations.

C. Handle materials in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. Non-shrink epoxy grout:
1. Manufacturers: One of the following or equal:
a. Five Star Products, Inc., Five Star Epoxy Grout.
b. BASF Construction Chemicals, Masterflow 648 CP Plus.
c. L&M Construction Chemicals, Inc., EPOGROUT.
2. Non-shrink epoxy grout shall be 100 percent solid, premeasured, prepackaged system containing 2-component thermosetting epoxy resin and inert aggregate.
3. Maintain flowable consistency for at least 45 minutes at 70 degrees Fahrenheit.
4. Shrinkage or expansion: Less than 0.0006 inches per inch when tested in accordance with ASTM C 531.
5. Minimum compressive strength: 10,000 pounds per square inch at 24 hours and 14,000 pounds per square inch at 7 days when tested in accordance with ASTM C 579, Method B.
6. Compressive creep: Not exceed 0.0027 inches/per inch when tested under 400 pounds per square inch constant load at 140 degrees Fahrenheit in accordance with ASTM C 1181.
7. Coefficient of thermal expansion: Not exceed 0.000018 inches per inch per degree Fahrenheit when tested in accordance with ASTM C 531, Method B.

B. Non-shrink grout:
1. Manufacturers: One of the following or equal:
a. Five Star Products, Inc., Five Star Grout.
b. BASF Construction Chemicals, Masterflow 928.
c. L&M Construction Chemicals, Inc., CRYSTEX.
2. In accordance with ASTM C 1107.
3. Preportioned and prepackaged cement-based mixture.

4. Contain no metallic particles such as aluminum powder and no metallic aggregate such as iron filings.
5. Require only addition of potable water.
6. Water for pre-soaking, mixing, and curing: Potable water.
7. Free from emergence of mixing water from within or presence of water on its surface.
8. Remain at minimum flowable consistency for at least 45 minutes after mixing at 45 degrees Fahrenheit to 90 degrees Fahrenheit when tested in accordance with ASTM C 230:
    a. If at fluid consistency, verify consistency in accordance with ASTM C 939.
9. Dimensional stability (height change):
    a. In accordance with ASTM C 1107, volume-adjusting Grade B or C at 45 degrees Fahrenheit to 90 degrees Fahrenheit.
    b. Have 90 percent or greater bearing area under bases.
10. Have minimum compressive strengths at 45 degrees Fahrenheit to 90 degrees Fahrenheit in accordance with ASTM C 1107 for various periods from time of placement, including 5,000 pounds per square inch at 28 days when tested in accordance with ASTM C 109 as modified by ASTM C 1107.

2.2 MIXES

A. Cement grout:
1. Use same sand-to-cementitious materials ratio for cement grout mix that is used for concrete mix.
2. Use same materials for cement grout that are used for concrete.
3. Use water-to-cementitious materials ratio that is no more than that specified for concrete.
4. For spreading over surfaces of construction or cold joints.

B. Cement mortar:
1. Use same sand-to-cementitious materials ratio for cement mortar mix that is used for concrete mix.
2. Use same materials for cement mortar that are used for concrete.
3. Use water-to-cementitious materials ratio that is no more than that specified for concrete being repaired.
4. At exposed concrete surfaces not to be painted or submerged in water: Use sufficient white cement to make color of finished patch match that of surrounding concrete.

C. Dry-pack mortar:
1. Proportions by weight: 1 part portland cement to 2 parts concrete sand.

D. Epoxy grout:
1. Consist of mixture of epoxy or epoxy gel and sand.
    a. Sand: Clean, bagged, graded, and kiln-dried silica sand.
2. Proportioning:
    a. For horizontal work: Consist of mixture of 1 part epoxy with not more than 2 parts sand.
    b. For vertical or overhead work: Consist of 1 part epoxy gel with not more than 2 parts sand.

E. Grout:
   1. Mix in proportions by weight: 1 part portland cement to 4 parts concrete sand.

F. Non-shrink epoxy grout:
   1. Mix in accordance with manufacturer's installation instructions.

G. Non-shrink grout:
   1. Mix in accordance with manufacturer's installation instructions such that resulting mix has flowable consistency and is suitable for placing by pouring.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations, and loose material or foreign matter likely to reduce bond or performance of grout or mortar.

3.2 PREPARATION

A. Surface preparation for grouting other baseplates:
   1. Remove grease, oil, dirt, dust, curing compounds, laitance, and other deleterious materials that may affect bond to concrete and bottoms of baseplates.
   2. Roughen concrete surfaces in contact with grout to ICRI CSP-6 surface profile or rougher:
      a. Remove loose or broken concrete.
   3. Metal surfaces in contact with grout: Grit blast to white metal surface.
   4. Apply concrete bonding agent prior to placemenmt of grouts or motar.

3.3 INSTALLATION

A. Mixing:
   1. Cement grout:
      a. Use mortar mixer with moving paddles.
      b. Pre-wet mixer and empty out excess water before beginning mixing.
   2. Cement mortar:
      a. Use mortar mixer with moving paddles.
      b. Pre-wet mixer and empty out excess water before beginning mixing.
   3. Dry-patch mortar:
      a. Use only enough water so that resulting mortar will crumble to touch after being formed into ball by hand.
   4. Non-shrink epoxy grout:
      a. Keep temperature of non-shrink epoxy grout from exceeding manufacturer's recommendations.
   5. Non-shrink grout:
      a. May be drypacked, flowed, or pumped into place. Do not overwork grout.
      b. Do not retemper by adding more water after grout stiffens.

B. Placement:

1. Cement grout:
    a. Exercise care in placing cement grout because it is required to furnish structural strength, impermeable water seal, or both.
    b. Do not use cement grout that has not been placed within 30 minutes after mixing.
2. Cement mortar:
    a. Use mortar mixer with moving paddles.
    b. Pre-wet mixer and empty out excess water before beginning mixing.
3. Epoxy grouts:
    a. Wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grout.
4. Non-shrink epoxy grout:
    a. Mix in complete units. Do not vary ratio of components or add solvent to change consistency of mix.
    b. Pour hardener into resin and mix for at least 1 minute and until mixture is uniform in color. Pour epoxy into mortar mixer wheelbarrow and add aggregate. Mix until aggregate is uniformly wetted. Over mixing will cause air entrapment in mix.
5. Non-shrink grout:
    a. Add non-shrink cement grout to premeasured amount of water that does not exceed the manufacturer's maximum recommended water content.
    b. Mix in accordance with manufacturer's instructions to uniform consistency.

C. Curing:
1. Cement based grouts and mortars:
    a. Keep continuously wet for minimum of 7 days. Use wet burlap, soaker hose, sun shading, ponding, and in extreme conditions, combination of methods.
    b. Maintain above 40 degrees Fahrenheit until it has attained compressive strength of 3,000 pounds per square inch, or above 70 degrees Fahrenheit for minimum of 24 hours to avoid damage from subsequent freezing.
2. Epoxy based grouts:
    a. Cure grouts in accordance with manufacturers' recommendations:
        1) Do not water cure epoxy grouts.
    b. Do not allow any surface in contact with epoxy grout to fall below 50 degrees Fahrenheit for minimum of 48 hours after placement.

D. Grouting other baseplates:
1. General:
    a. Use non-shrink grout as specified in this Section.
    b. Baseplate grouting shall take place from one side of baseplate to other in continuous flow of grout to avoid trapping air in grout.
    c. Maintain hydrostatic head pressure by keeping level of grout in headbox above bottom of baseplate. Fill headbox to maximum level and work grout down.
    d. Vibrate, rod, or chain non-shrink grout to facilitate grout flow, consolidate grout, and remove trapped air.
2. Forms and headboxes:
    a. Build forms using material with adequate strength to withstand placement of grouts.
    b. Use forms that are rigid and liquidtight. Caulk cracks and joints with elastomeric sealant.

c. Line forms with polyethylene for easy grout release. Coating forms with 2 coats of heavy-duty paste wax is also acceptable.
d. Headbox shall be 4 to 6 inches higher than baseplate and shall be located on one side of baseplate.
e. After grout sets, remove forms and trim back grout at 45 degree angle from bottom edges of baseplate.

3.4 FIELD QUALITY CONTROL

A. Non-shrink epoxy grout:
1. Test for 24-hour compressive strength in accordance with ASTM C 579, Method B.

B. Non-shrink grout:
1. Test for 24-hour compressive strength in accordance with ASTM C 942.

END OF SECTION

SECTION 05190

MECHANICAL ANCHORING AND FASTENING TO CONCRETE AND MASONRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Cast-in anchors and fasteners:
      a. Anchor bolts.
   2. Post-installed steel anchors and fasteners:
      a. Concrete anchors.
   3. Appurtenances for anchoring and fastening:
      a. Isolating sleeves and washers.
      b. Thread coating for threaded stainless steel fasteners.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 01330 - Submittals.
      b. Section 01410 - Regulatory Requirements.
      c. Section 01450 - Quality Control.
      d. Section 01610 - Project Design Criteria.
      e. Section 03055 - Adhesive-Bonded Reinforcing Bars and All Thread Rods.

1.2 REFERENCES

A. American Concrete Institute (ACI):
   1. 355.2 – Qualification of Post-Installed Mechanical Anchors in Concrete & Commentary.

B. American National Standards Institute (ANSI):
   1. B212.15 - Cutting Tools - Carbide-tipped Masonry Drills and Blanks for Carbide-tipped Masonry Drills.

C. American Welding Society (AWS):
   1. D1.1 - Structural Welding Code - Steel.
   2. D1.6 - Structural Welding Code - Stainless Steel.

D. ASTM International (ASTM):
   1. A 29 – Standard Specification for Steel Bars, Carbon and Alloy, Hot-Wrought,

General Requirements for.

2. A 36 - Standard Specification for Carbon Structural Steel.
3. A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
4. A 108 - Standard Specification for Steel Bars, Carbon and Alloy, Cold Finished.
5. A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
6. A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
7. A 193 - Standard Specification for Alloy Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
8. A 194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
9. A 240 - Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
10. A 308 - Standard Specification for Steel Sheet, Terne (Lead-Tin Alloy) Coated by the Hot-Dip Process.
11. A 496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
12. A 563 - Standard Specification for Carbon and Alloy Steel Nuts.
13. B 633 - Standard Specification for *Electrodeposited* Coatings of Zinc on Iron and Steel.
14. B 695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
15. E 488 - Standard Test Methods for Strength of Anchors in Concrete Elements.
16. F 436 - Standard Specification for Hardened Steel Washers.
17. F 1554 - Standard Specification for Anchor Bolts, Steel, 36, 55 and 105-ksi Yield Strength.

E. International Code Council Evaluation Service, Inc. (ICC-ES):
   1. AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements.

1.3 DEFINITIONS

A. Built-in anchor: Headed bolt or assembly installed in position before filling surrounding masonry units with grout.

B. Cast-in anchor: Headed bolt or assembly installed in position before placing plastic concrete around.

C. Overhead installations: Fasteners installed on overhead surfaces where the longitudinal axis of the fastener is more than 60-degrees above a horizontal line so that the fastener resists sustained tension loads.

D. 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.

E. Post-installed anchor: Fastener or assembly installed in hardened concrete or finished

masonry construction, typically by drilling into the structure and inserting a steel anchor assembly.

F. Terms relating to structures or building environments as used with reference to anchors and fasteners:
   1. Corrosive locations: Describes interior and exterior locations as follows:
      a. Locations used for delivery, storage, transfer, or containment (including spill containment) of chemicals used for plant treatment processes.
      b. Exterior and interior locations at the following treatment structures:
         1) Wastewater treatment facilities: Liquids stream:
            a) Headworks and grit facilities.
            b) Primary clarifiers and primary clarifier flow splitting boxes.
   2. Wet and moist locations: Describes locations, other than “corrosive locations,” that are submerged, are immediately above liquid containment structures, or are subject to frequent wetting, splashing, or wash down. Includes:
      a. Exterior portions of buildings and structures.
      b. Liquid-containing structures:
         1) Locations at and below the maximum operating liquid surface elevation.
         2) Locations above the maximum operating liquid surface elevation and:
            a) Below the top of the walls containing the liquid.
            b) At the inside faces and underside surfaces of a structure enclosing or spanning over the liquid (including walls, roofs, slabs, beams or walkways enclosing the open top of the structure).
      c. Liquid handling equipment:
         1) Bases of pumps and other equipment that handles liquids.
      d. Indoor locations exposed to moisture, splashing or routine wash down during normal operations, including floors with slopes toward drains or gutters.
      e. Other locations indicated on the Drawings.
   3. Other locations:
      a. Interior dry areas where the surfaces are not exposed to moisture or humidity in excess of typical local environmental conditions.

1.4 SUBMITTALS

A. General:
   1. Submit as specified in Section 01330.
   2. Submit information listed for each type of anchor or fastener to be used.

B. Action submittals:
   1. Product data:
      a. Cast-in anchors:
         1) Manufacturer’s data including catalog cuts showing anchor sizes and configuration, materials, and finishes.
      b. Post-installed anchors:
         1) For each anchor type, manufacturer’s data including catalog cuts showing anchor sizes and construction, materials and finishes, and load ratings.

2. Samples:
   a. Samples of each type of anchor, including representative diameters and lengths, if requested by the Engineer.
3. Certificates:
   a. Cast-in anchors:

1) Mill certificates for steel anchors that will be supplied to the site.

b. Post-installed anchors:

1) Manufacturer's statement or certified test reports demonstrating that anchors that will be supplied to the site comply with the materials properties specified.

4. Test reports:

a. Post-installed anchors: For each anchor type used for the Work:

1) Current ICC-ES Report (ESR**)** demonstrating:

a) Acceptance of that anchor for use under the building code specified in Section 01410.

b) That testing of the concrete anchor included the simulated seismic tension and shear tests of AC193, and that the anchor is accepted for use in Seismic Design Categories C, D, E, or F and with cracked concrete.

5. Manufacturer's instructions:

a. Requirements for storage and handling.

b. Recommended installation procedures including details on drilling, hole size (diameter and depth), hole cleaning and preparation procedures, anchor insertion, and anchor tightening.

c. Requirements for inspection or observation during installation.

6. Qualification statements:

a. Post-installed anchors: Installer qualifications:

1) Submit list of personnel performing installations and include date of manufacturer's training for each.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Post installed anchors shall be in accordance with building code specified in Section 01410.

2. Installers: Post-installed mechanical anchors:

a. Conduct a training session with the manufacturer's authorized technical representative for the project on-site:

1) Training shall cover the complete installation process for each type of anchor to be used and shall include, but not be limited to hole drilling procedures and techniques; hole preparation and cleaning; bolt installation; and bolt proof loading and torqueing.

2) Use only trained and qualified personnel for anchor installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver post-installed anchors in manufacturer's standard packaging with labels visible and intact. Include manufacturer's installation instructions.

B. Handle and store anchors and fasteners in accordance with manufacturer's recommendations and as required to prevent damage.

C. Protect anchors from weather and moisture until installation.

1.7 PROJECT CONDITIONS

A. Seismic Design Category (SDC) for structures is D.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. General:
   1. Furnish threaded fasteners with flat washers and hex nuts fabricated from materials corresponding to the material used for threaded portion of the anchor:
      a. Cast-in anchors: Provide flat washers and nuts as listed in the ASTM standard for the anchor materials specified.
      b. Post-installed anchors: Provide flat washers and nuts supplied for that product by the manufacturer of each anchor.
   2. Size of anchors and fasteners, including diameter and length or minimum effective embedment depth: As indicated on the Drawings or as specified in this Section. In the event of conflicts, contact Engineer for clarification.
   3. Where anchors and connections are not specifically indicated on the Drawings or specified, their material, size and form shall be equivalent in quality and workmanship to items specified.

B. Materials:
   1. Provide and install anchors of materials as in this Section.

2.2 CAST-IN ANCHORS AND FASTENERS – Not Used

2.3 FASTENERS – ADHESIVE

A. Epoxy bonding of reinforcing bars, all thread rods, and threaded inserts in concrete: As specified in Section 03055.

B. All bars, threaded rods, and inserts shall be 316 Stainless steel.

2.4 POST-INSTALLED ANCHORS AND FASTENERS – MECHANICAL - Not Used

2.5 APPURTENANCES FOR ANCHORING AND FASTENING

A. Isolating sleeves and washers:
   1. Manufacturers: One of the following or equal:
      a. Central Plastics Company, Shawnee, Oklahoma.
      b. Corrosion Control Products, PSI Inc., Gardena, CA.
   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: The inside diameter of all washer 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. 2 insulating washers are required for each bolt.
      b. Two 1/8-inch thick steel washers for each bolt.
      c. G3 Phenolic:
         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.

B. Thread coating. For use with threaded stainless steel fasteners:
1. Manufacturers: One of the following or equal:
a. Never Seez Compound Corporation, Never-Seez.
b. Oil Research, Inc., WLR No. 111.

PART 3 EXECUTION

3.1 EXAMINATION

A. 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.

3.2 INSTALLATION: GENERAL

A. Where anchors and fasteners are not specifically indicated on the Drawings or specified, make attachments with materials specified in this Section.

B. Substitution of anchor types:
1. Post-installed anchors may not be used as an alternative to cast-in / built-in anchors at locations where the latter are indicated on the Drawings.
2. Cast-in/built-in anchors may be used as an alternative to post-installed mechanical anchors at locations where the latter are indicated on the Drawings.

C. Protect products from damage during installation. Take special care to protect threads and threaded ends.

D. Accurately locate and position anchors and fasteners:
1. Unless otherwise indicated on the Drawings, install anchors perpendicular to the surfaces from which they project.
2. Install anchors so that at least 2 threads, but not more than 1/2 inch of threaded rod, projects past the top nut.

E. Interface with other products:
1. Where steel anchors come in contact with dissimilar metals (aluminum, stainless steel, etc.), bolt with stainless steel bolts and separate or isolate dissimilar metals using isolating sleeves and washers.
2. Prior to installing nuts, coat threads of stainless steel fasteners with thread coating to prevent galling of threads.

3.3 INSTALLATION: CAST-IN ANCHORS – Not Used

3.4 INSTALLATION: POST-INSTALLED ADHESIVE ANCHORS

A. Epoxy and acrylic adhesive bonding of reinforcing bars, all thread rods, and internally threaded inserts in concrete: As specified in Section 03055.

3.5 INSTALLATION: POST-INSTALLED MECHANICAL ANCHORS – Not Used

3.6 FIELD QUALITY CONTROL

A. Contractor shall provide quality control over the Work of this Section as specified in Section 01450:
   1. Expenses associated with work described by the following paragraphs shall be paid by the Contractor.

B. Post-installed anchors:
   1. Review anchor manufacturer's installation instructions and requirements of the Evaluation Service Report (hereafter referred to as "installation documents") for each anchor type and material.
   2. Observe hole-drilling and cleaning operations for conformance with the installation documents.
   3. Certify in writing to the Engineer that the depth and location of anchor holes, and the torque applied for setting the anchors conforms to the requirements of the installation documents.

3.7 FIELD QUALITY ASSURANCE

A. Engineer will provide on-site observation and field quality assurance for the Work of this Section:
   1. Expenses associated with work described by the following paragraphs shall be paid by the Engineer.

B. Field inspections and special inspections:
   1. Required inspections: Observe construction for conformance to the approved Contract Documents, the accepted submittals, and manufacturer's installation instructions for the products used.
   2. Record of inspections:
      a. Maintain record of each inspection.
      b. Submit copies to Engineer upon request.
   3. Statement of special inspections: At the end of the project, prepare and submit to the Engineer and the authority having jurisdiction inspector's statement that the Work was constructed in general conformance with the approved Contract Documents, and that deficiencies observed during construction were resolved.

C. Special inspections: Anchors cast into concrete and built into masonry:
   1. Provide special inspection during positioning of anchors and placement of concrete around the following anchors:
      a. Anchor bolts.
      b. Anchor rods.
   2. During placement, provide continuous special inspection at each anchor location to verify that the following elements of the installation conform to the requirements of the Contract Documents:
      a. Anchor:

1) Type and dimensions.
2) Material: Galvanized steel, Type 304 stainless steel, or Type 316 stainless steel as specified in this Section or indicated on the Drawings.
3) Positioning: Spacing, edge distances, effective embedment, and projection beyond the surface of the construction.
4) Reinforcement at anchor: Presence, positioning, and size of additional reinforcement at anchors indicated on the Drawings.

3. Following hardening and curing of the concrete or masonry surrounding the anchors, provide periodic special inspection to observe and confirm the following:
   a. Base material (concrete or grouted masonry):
      1) Solid and dense concrete or grouted masonry material within required distances surrounding anchor.
      2) Material encapsulating embedment is dense and well-consolidated.

D. Special Inspections: Post-installed mechanical anchors placed in hardened concrete and in grouted masonry:
   1. Provide special inspection during installation of the following anchors:
      a. Concrete anchors.
      b. Sleeve anchors.
      c. Screw anchors.
   2. Unless otherwise noted, provide periodic special inspection during positioning, drilling, placing, and torqueing of anchors:
      a. Provide continuous special inspection for post-installed anchors in "overhead installations" as defined in this Section.
   3. Requirements for periodic special inspection:
      a. Verify items listed in the following paragraphs for conformance to the requirements of the Contract Documents and the Evaluation Report for the anchor being used. Observe the initial installation of each type and size of anchor, and subsequent installation of the same anchor at intervals of not more than 4 hours:
         1) Any change in the anchors used, in the personnel performing the installation, or in procedures used to install a given type of anchor, shall require a new "initial inspection."
      b. Substrate: Concrete or masonry surfaces receiving the anchor are sound and of a condition that will develop the anchor's rated strength.
      c. Anchor:
         1) Manufacturer, type, and dimensions (diameter and length).
         2) Material (Type 304 stainless steel, or Type 316 stainless steel).
      d. Hole:
         1) Positioning: Spacing and edge distances.
         2) Drill bit type and diameter.
         3) Diameter, and depth.
         4) Hole cleaned in accordance with manufacturer's required procedures. Confirm multiple repetitions of cleaning when recommended by the manufacturer.
         5) Anchor's minimum effective embedment.
         6) Anchor tightening/installation torque.
   4. Requirements for continuous special inspection:
      a. The special inspector shall observe all aspects of anchor installation,

except that holes may be drilled in his/her absence provided that he/she confirms the use of acceptable drill bits before drilling, and later confirms the diameter, depth, and cleaning of drilled holes.

E. Field tests:
   1. Engineer's Representative may, at any time, request testing to confirm that materials being delivered and installed conform to the requirements of the Specifications:
      a. If such additional testing shows that the materials do not conform to the specified requirements, the Contractor shall pay the costs of these tests.
      b. If such additional testing shows that the materials do conform to the specified requirements, the Engineer shall pay the costs of these tests.
   2. Field testing: Post-Installed Anchors:
      a. Proof load testing:
         1) In addition to performing special inspections, the Engineer's Representative may select up to 20 percent of each type and size of post-installed mechanical anchor for proof-load testing for pullout or shear. Tests shall be non-destructive whenever possible.
         2) Perform tension testing in accordance with ASTM E 488. Apply proof loads using a calibrated hydraulic ram.
      b. Torque load testing:
         1) Using a calibrated torque wrench, apply manufacturer's recommended installation torque.
      c. Acceptance criteria:
         1) Minimum anchor embedment, proof load for pullout and shear, and torque shall be as specified in this Section.
         2) Anchors that fail to resist their designated proof load or installation torque requirements shall be regarded as non-performing.
         3) If more than 10 percent of the tested anchors fail to achieve their specified torque or proof load, all anchors of the same diameter and type as the failed anchors shall be tested.
         4) Remediate non-performing anchors as specified in "non-conforming work."

3.8 NON-CONFORMING WORK

A. Remove miss-aligned or non-performing anchors.

B. Fill empty anchor holes and repair failed anchor locations as specified in Section 03600 using high-strength, non-shrink, non-metallic grout.

C. If more than 10 percent of all tested anchors of a given diameter and type fail to achieve their specified torque or proof load, the Engineer will provide directions for required modifications. Make such modifications, up to and including replacement of all anchors, at no additional cost to the Engineer.

END OF SECTION

SECTION 09998

CONCRETE STRUCTURE CORROSION PROTECTIVE COATING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Coating systems used for interior of diversion box and waste hauler vault rehabilitation.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
   2. C1583 - Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-Off Method).
   3. D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
   4. D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
   5. D4414 - Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
   6. D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
   7. D4787 - Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.
   8. D6132 - Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage.
   9. D7234 - Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.

B. NACE International (NACE).
   1. NACE RPO 188-99 Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates

C. Society for Protective Coatings (SSPC):
   1. SSPC-SP 1 – Solvent Cleaning
   2. SSPC-SP 5 - White Metal Blast Cleaning
   3. SSPC-SP 10 - Near White Metal Blast Cleaning
   4. SSPC-SP 12 Surface Preparation and Cleaning of Metals by Water jetting prior to Recoating.
   5. SSPC SP-13/NACE No. 6 – Surface Preparation of Concrete.
   6. SSPC-PA 9 - Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages.

1.3 DEFINITIONS

A. Specific coating terminology used in this Section is in accordance with definitions contained in ASTM D16, ASTM D3960, and the following definitions:
   1. Coating systems.
      a. "Coating" (or "coatings") and "lining" (or "linings") are used interchangeably. Similarly, "to coat" is used interchangeably with "to line" (or other variations of these words).
      b. "Manhole" means "sewer structure" and encompasses sewer manholes, and other sewer structures.
         1) It also encompasses sewer pipes (or portions thereof) that are located within the sewer structure, but does not include sewer pipes (or portions thereof) that are located outside of the limits of the structure.
      c. "Existing manholes" means those manholes that are (or were) not constructed as part of this project work.
      d. "Rehabilitating" existing manholes by applying corrosion protective coating shall include the following activities:
         1) Cleaning the manhole and removing corroded/deteriorated materials from the manhole and preparing the manhole in accordance with the approved coating systems manufacturer's specifications.
         2) Applying 1 of the approved coating systems, as specified in this Section.
         3) Testing the finished surface coating, as required in this Section.
         4) Other related activities, as noted in this Section.
   2. Dry film thickness (DFT).
      a. The thickness of 1 fully-cured continuous application of coating.
   3. Certified applicator:
      a. Person who is certified by the approved coating system manufacturer, assigned by Contractor to apply the specified coating system.

1.4 SUBMITTALS

A. Submittals: As specified in Section 01330 - Submittal Procedures.

B. Manufacturer's certification of applicator.

C. Manufacturer's written warranty.

D. Manufacturer's certification program training course outline.
   1. Certification program must include an annual renewal.

E. Product data.

F. Contractor Certification Letter stating that:
   1. Contractor accepts responsibility for products and the installation of the products as specified in this Section.

G. Spark test certification for each manhole.

H. Qualifications for spark testing.

1. Contractor shall show that the spark tester equipment has a current calibration certificate following accordance with ASTM D4787 for the procedure, at 100 volts minimum per mil coating thickness.

I. Adhesion test certification for each test.
   1. Contractor shall show that the adhesion testing equipment has a current calibration certificate in accordance with ASTM D7234 for the test.

J. Coating system application plan.

K. Submit product data to Engineer prior to delivering materials to job site.

L. Manufacturer's application instructions including:
   1. Special equipment.
   2. Surface preparation recommendations, including repairs and re-profiling.
   3. Primer type, where required.
   4. Maximum dry and wet film thickness.
   5. Curing methods.
   6. Minimum and maximum curing time between coats, including atmospheric conditions for each.
   7. Curing time before submergence in liquid.
   8. Thinner to be used with coating material.
   9. Ventilation requirements.
   10. Minimum atmospheric conditions for applying coating.
   11. Allowable application methods.
   12. Maximum allowable moisture content of substrate.
   13. Maximum storage life.
   14. Define material to stop the infiltration and confirm compatibility of water-infiltration materials with the protective coating system.
   15. Define repair and fill material.

1.5 PRODUCT STORAGE AND HANDLING REQUIREMENT

A. Deliver materials to the job site in their original, unopened containers.

B. Container marking: Manufacturer's name, coating type, batch number, date of manufacture, storage life, and special handling directions.

C. Store materials in enclosed structures protected from weather, excessive heat and excessive cold.

D. Store flammable materials in accordance with state and local codes.

E. Materials exceeding the storage life recommended by the manufacturer are subject to rejection by Engineer.
   1. Remove rejected materials from the site and replace at no additional cost to Owner.

1.6 QUALITY CONTROL

A. Coating system application plan:
   1. Quality Control Procedures:
      a. Detailed duties of the Applicator's Superintendent.
      b. Detailed duties of the Manufacturer's Representative.
      c. Training program outline qualifying personnel in the correct storage and handling of coating materials, and the necessary safety requirements.
      d. List of application and testing equipment to be used, including inspections confirming satisfactory condition of equipment.
      e. Detailed procedures and methods for surface preparation including repair and re-profiling if required, application of primer and/or underlayment (if needed), and final coating, and testing.
   2. Criteria for acceptance of the preparation of concrete and manhole surfaces.
   3. Plan for sewage diversion (when required) or flow control.
   4. Method and material for sealing active leaks.
   5. Detailed plan of surface preparation, including repair and re-profiling.
   6. Details of application of primer and finish coats, including required curing times.
   7. Detailed environmental provisions such as shading from the sun.
   8. Detailed scheduling provisions for environmental considerations such as working at night.
   9. Testing procedures:
      a. Dry film thickness testing in accordance with ASTM D6132.
      b. Spark testing in accordance with ASTM D4787.
      c. Adhesion testing in accordance with ASTM D4541 and D7234.
      d. Wet Film thickness in accordance with ASTM D4414.
      e. Vacuum testing in accordance with ASTM C1244.

B. Certified applicator:
   1. Provide Manufacturer's certification that coating system applicator is trained and qualified to install the coating system, as specified in this Section.
      a. Provide evidence that the personnel performing the coating application on this Project received the Manufacturer's training for certification for coating system, as specified in this Section.
      b. Provide name of Applicator's Superintendent who will take full responsibility for the quality of the work.
      c. Approved applicator:
         1) Must be approved by and have completed a training program by the manufacturer and have a minimum of 5 years application experience with the coating system as specified in this Section.
         2) Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM and NACE standards together with pull testing and vacuum testing to assure a high quality project.
         3) Applicator shall use an adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts.
            a) These workmen shall be completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section, and have a minimum of 4 years of experience each in the coating restoration of underground structures.

b) No more than 1 inexperienced apprentices will be allowed for each 4-man crew.

4) The superintendent must have a minimum of 5 years of experience in coating restoration.

5) Applicator shall use approved specialty equipment adequate in size, capacity, and number sufficient to accomplish the work of this Section in a timely manner.

C. Manufacturer's specification containing instructions and quality control procedures meeting the following requirements:

1. Must be written and published by the manufacturer for the purpose of giving complete instruction for the use and application of the proposed coating system for the conditions for which the coating is specified in this Section.
2. Clearly and completely state limitations, exceptions, precautions, and requirements that may adversely affect the performance of the coating system.
   a. Temperature and humidity limitations for minimum and maximum conditions are to be included.
   b. If the manufacturer's requirements differ from requirements specified in this Section, clearly note where deviations are required.
      1) Requires Engineer approval of deviations.

1.7 WARRANTY

A. Provided Manufacturers standard warranty as modified herein.

B. Special warranty:

1. Provide maintenance warranty from Contractor to cover workmanship and materials for each access manhole or structure coated with an approved corrosion protective coating renewed yearly for a period of not less than 5 years from the date of final acceptance of the project.
   a. Submit warranty to Engineer prior to and as a condition of Project final acceptance.
   b. Warranty also applies to repair materials, primers, or other products used in the application.
   c. The warranty shall also be unconditional in nature covering any type of failure in the coating and agreeing to repair or replace it at no cost to Owner at any point during the 5-year period.
2. Coating failure is defined as blistering, cracking, embrittlement, or softening, or failure to adhere to the substrate.
3. Testing performed by the Owner during construction (e.g., spark testing, adhesion testing, and/or other testing) does not in any way modify the warranty, nor relieve the Contractor's responsibility for responding and correcting defects during the warranty period.

PART 2 PRODUCTS

2.1 MANUFACTURERS – CONCRETE REPAIR

A. Repair products shall be used to fill voids or bugholes, smooth transitions between

components, replace lost mortar in masonry structures, smooth rough surfaces, and rebuild severely deteriorated substrates and/or to remediate infiltration prior to the installation of the coating product(s).

1. Repair materials must be supplied by the coating product(s) manufacturer or shall be expressly approved by the coating product(s) manufacturer in writing for compatible with the specified coating product(s).
2. All materials shall be mixed, applied, and cured in accordance with the manufacturer's recommendations.
3. Repair product physical properties shall be substantiated through submittal of accredited third party testing results and shall be representative of the actual field applied product and cure mechanism(s) to be employed in the field.

B. 100% solids, solvent-free epoxy grout; specifically the specified coating product(s) (Section 2.3 C.) enhanced with Raven 200 polyolefin fiber filler or other approved aggregate.

C. Factory blended, rapid setting, high-early strength, non-shrink, calcium aluminate repair mortar to be trowel or pneumatically spray applied to the entire surface.
   1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-6150-140 fax.
   2. Product: Raven 705CA Cement Mortar (to match coating) or equal having the following characteristics:
      a. Product Type: Calcium aluminate mortar
      b. Tensile Strength, psi (ASTM C496):>600
      c. Compressive Strength, psi (ASTM C109): >8,000 @ 28 days
      d. Flexural Strength, psi (ASTM C293): >900
      e. Shrinkage @ 90% R. H., % (ASTM C596): 0
      f. Adhesion to Concrete, psi (ASTM C882): >2000 psi
      g. Adhesion to Concrete, psi (ASTM D7234): >150 psi
      h. Freeze/Thaw (ASTM C666): 100 Cycles, no visible damage
      i. Density of wet mix: 129 – 139 lbs./ft^3.
      j. Applied Density: 135 lbs/ft^3 (+/- 5 lbs).

D. Factory blended, high strength, non-shrink, cementitious repair mortar to be troweled or otherwise manually applied to repair/fill minor surface defects from featheredge to ¼" in thickness.
   1. Manufacturer: Raven Lining Systems
   2. Product: Raven 710 – Cement Mortar (to match coating) or equal having the following characteristics:
      a. Product Type: Calcium aluminate mortar
      b. Compressive Strength, psi (ASTM C109): >5,000 @ 28 days
      c. Shrinkage @ 90% R. H., % (ASTM C596): 0
      d. Adhesion to Concrete, psi (ASTM C882): >1600 psi
      e. Adhesion to Concrete, psi (ASTM D7234): >150 psi

E. Factory blended, high-early strength, non-shrink, cementitious repair mortar to be trowel applied to fill large voids or repair bench and inverts.
   1. Manufacturer: Raven Lining Systems
   2. Product: Raven 700 Cement Mortar (to match coating) or equal having the following characteristics:

a. Product Type: Calcium aluminate mortar
b. Compressive Strength, psi (ASTM C109): >1,800 @ 24 hours
c. Adhesion to Concrete, psi (ASTM C882): >1600 psi
d. Adhesion to Concrete, psi (ASTM D7234): >150 psi
e. Density of wet mix: 100 – 110 lbs./ft^3.

F. Factory blended, non-shrink, hydraulic cement to be used for infiltration remediation.
1. Manufacturer: As applicable
2. Product: Hydraulic cement having the following characteristics:
a. Product Type: Hydraulic cement
b. Compressive Strength, psi (ASTM C109): >1,000 @ 1 hour, >2500 psi @ 24 hours
c. Shrinkage @ 90% R. H., % (ASTM C596): 0

G. Hydrophobic or Hydrophilic injectable urethane chemical grout to be used for the remediation of high volume infiltration or crack repair and/or soil stabilization and void filling.
1. Manufacturer: As applicable
2. Product: Urethane chemical grout as appropriate for infiltration, crack repair and soil stabilization.

2.2 MANUFACTURERS – CONCRETE COATING

A. Coating product shall be applied to all interior surfaces to protect the host substrate and repair materials from all forms of chemical or bacteriological attack typically found in municipal sanitary sewer systems and to impart a degree of structural enhancement.

B. Coating product physical properties shall be substantiated through submittal of accredited third party testing results and shall be representative of the actual field applied product and cure mechanism(s) to be employed in the field.

C. 100% Solids, Solvent-Free, Ultra-High Build Epoxy Coating to be spray applied to all interior surfaces of exposed concrete or as otherwise detailed.
1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-6150-140 fax.
2. Product: Raven 405 or equal, 100% solids, solvent-free ultra high-build epoxy system exhibiting the following characteristics:
a. Product Type: amine cured epoxy
b. VOC Content (ASTM D2584): 0%
c. Compressive Strength, psi (ASTM D695): 18,000 (minimum)
d. Tensile Strength, psi (ASTM D638): 7,500 (minimum)
e. Flexural Modulus, psi (ASTM D790): 700,000 (minimum)
f. Adhesion to Concrete, psi/mode of failure (ASTM D4541/7234): 200 psi (minimum) with substrate (concrete) failure
g. Chemical Resistance (ASTM D543/G20) immersion service for:
1) Municipal sanitary sewer environment
2) Sulfuric Acid, 30%
3) Sodium Hydroxide, 10%

4) Sodium Hypochlorite, 12.5%

h. Successful Pass: Sanitation District of L.A. County Coating Evaluation Study and SSPWC 210.2.3.3 (Greenbook “Pickle Jar” Chemical Resistance test)

D. Coating product primer to be applied as recommended by the coating product manufacturer as installation conditions warrant.
1. Manufacturer: Raven Lining Systems.
2. Product: Raven 155 or equal, Water borne epoxy primer having the following characteristics:
a. Product Type: amine cured, waterborne epoxy primer

E. 100% Solids, Solvent-Free, Ultra-High Build Epoxy Coating to be manually or spray applied to interior surfaces of exposed concrete below the typical flow line; specifically designed for accelerated cure and suitable for release of flow in less than 45 minutes at normal service temperatures or as otherwise detailed.
1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-6150-140 fax.
2. Product: Raven 405 FS or equal, 100% solids, solvent-free ultra high-build epoxy system.

2.3 DESCRIPTION

A. Coating system includes underlayment material (if needed) and surface coating material.

B. Sprayable or trowelable formulations of the listed products listed are acceptable.
1. Apply "sprayable" product by an airless sprayer specially designed for use in the spray of the specified system. The equipment must be approved for use by the manufacturer.
2. Trowel finish final surface coating layer before setting.
3. Do not re-use or apply rebounded, spilled, or over-sprayed material.

C. Apply coating systems according to manufacturer's instructions and as specified in this Section.

D. Provide materials from a single coating system manufacturer, both underlayment and surface coating, in each manhole installation.

E. Apply coating system to exposed brick, concrete, grout, mortar, and cementitious surfaces within the manhole, including unlined concrete and PVC pipes within the manhole, bench-to-pipe transitions, bench, risers, cones, adjusting rings, etc.

F. If flowing sewage is present, install flow through bypass plugs in incoming pipes up to 15 inches in diameter in order to direct the flow away from the invert to allow the lining of the invert area.

G. Manholes with pipes above 15 inches may be bypassed, installed with flow through bypass plugs, or coated down to the liquid line in accordance with the Engineer's direction. If coating down to the liquid line, a termination key cut shall be installed above

the liquid line and filled with coating.

H. Remove the ladder rungs prior to coating operations.

I. Do not coat metallic manhole frame and cover, or stainless steel slide gate components.

J. A termination key cut shall be installed below the frame and filled with coating.

2.4 ENVIRONMENTAL CONDITIONS

A. Install products furnished specified in this Section in sanitary sewer manholes.

B. Products will be exposed to the extremes in temperatures and humidity. Contractor shall consult the coating manufacturer for limits on ambient conditions and shall make the manufacturer's recommendations available onsite for the applicator and Engineer.

C. Products will be exposed to corrosive, abrasive and reactive liquids and gasses associated with sewers.

D. Products will be immersed or intermittently immersed in sewer.

E. Product surfaces are subject to splashing of sewer.

2.5 COATING SYSTEMS

A. Provide coating systems compatible with the concrete surface preparation methods as specified in this Section.

B. Apply coatings within a maximum of 2 months of manufacture date, unless the manufacturer's requirements are more stringent or otherwise approved in writing by the Engineer.

C. Thicknesses specified in this Section are the minimum dry film thickness required and do not include the primer or resurfacing material thickness, unless otherwise noted.
   1. Minimum thickness: 250 mils for concrete.
   2. Provide greater thickness where recommended by the manufacturer.

D. Apply primer as recommended by the manufacturer for each installation.

E. Provide defect filler and repair materials as recommended by the manufacturer for each installation to ensure a bond at the molecular level in order to prevent migration of bacteria and sewer gases through the monolithic system.

F. Provide manhole infiltration control material as recommended by the manufacturer for each installation.
   1. Manhole infiltration control material will be covered under the same warranty as the rest of the coating system.

PART 3 EXECUTION

3.1 CLEANING AND PREPARATION

A. Contractor and Manufacturer's Representative inspect surfaces specified to receive coating system prior to surface cleaning and preparation.
   1. Notify Engineer of any noticeable disparity in the surfaces that may interfere with the proper preparation, or application of the coating system.

B. Surface preparation of manhole to be coated:
   1. Remove dust, loose particles, corroded or damaged materials, oils, grease, curing compounds, chemical contaminants, paints, and insecticide coatings, prior to application of the approved coating.
   2. Caution: Manhole cleaning and preparation activities (e.g., water blasting and/or abrasive blasting) may cause damage to certain materials and finishes.
      a. Contractor is solely responsible to protect portions of the manhole (including appurtenances and attachments) that are not slated for such cleaning and preparation activities from damage and shall be responsible to repair any damage caused by the cleaning and preparation activities.
   3. Clean by high-pressure cold water blast:
      a. Minimum 3000 PSI pump pressure at 4 GMP.
      b. With or without sand injection.
   4. Clean by low-pressure hot water blast:
      a. Minimum 2500 PSI pump pressure at 4 GMP.
      b. Hot water temperature 225 degree F.
   5. Additional manhole cleaning methods may be used, subject to Engineer approval, as necessary to properly clean and prepare the manhole for the coating system.
      a. Other methods are high-pressure water jetting, shot blasting, grinding, mechanical removal methods, chemical cleaning, detergent cleaning, hot water blasting, and acid etching.
      b. Neutralize substrate and wash off residue when chemical cleaning or acid-etching are used.
      c. Neutralize the surface with mild chlorine solution to diminish microbiological bacteria growth prior to final rinse and coating system.
   6. Chemicals:
      a. In conformance with local, state and federal laws and regulations.
      b. Submit chemical information to Engineer, prior to their use.
   7. Suitably prepared manhole:
      a. Loose, soft, discolored, or otherwise deteriorated material removed from the manhole.
      b. Expose aggregate.
      c. Water vapor transmission test shall be as required by the coating manufacturer. Manufacturer recommended parameters shall be available on site for the applicator and Engineer.
      d. Engineer is not obligated but may use 1 or more of the following observations/tests to determine manhole substrate preparation suitability:
         1) Visual appearance of sound concrete (or brick and/or mortar), free from discolored, white, chalky and cracked areas.
         2) Aural observations: Exhibit the characteristic sound of solid, competent concrete (or brick) when struck with a metal hammer or similar metal

tool. Care will be taken not to fracture sound concrete.

3) Mechanical abrasion tests: Cannot be scraped off with the claw of a hammer or similar metal tool.
4) pH testing: Minimum pH of 7 tested by applying wetted litmus paper to the surface of the substrate.
5) Phenolphthalein testing: Concrete competency indicated by purple color when a few drops of phenolphthalein are applied to the surface of the concrete.

8. Preparation rejected:
   a. Engineer has authority to require additional cleaning effort as required to adequately prepare the manhole.
      1) Increase water blasting pressure.
      2) Acid etching of the concrete surface to create the desired texture.
      3) Mechanical removal of deteriorated concrete or other substrate materials in existing manholes.

C. Manhole step removal:
   1. Cut manhole steps flush with wall surface, unless otherwise directed by the Engineer.
   2. Voids or holes remaining from removal of the steps: Fill and trowel flush with wall using manhole patching material approved by Manufacturer.

D. Debris removal:
   1. Remove dirt, rocks, rust, spalled masonry (including mortar, concrete, and brick), roots, sludge, grease grit, and other deleterious materials and debris from the interior of the junction structure and access manholes.
   2. Collect cleaning operations debris within the manhole and dispose of at a plant designated dumpster.

E. Defects:
   1. Eliminate visible water infiltration or seepage through seams in the existing manhole walls using material defined by Manufacturer and approved by the Engineer.
   2. Grout with a watertight, expansive grout approved by Manufacturer, the area between the manhole and the manhole ring and any other area that might exhibit movement or cracking due to expansion and contraction.
   3. Restore the manhole profile surface to original thickness and replace corroded or missing reinforcement.
      a. Propose manhole profile restoration and replacement procedures for Engineer review and approval.

3.2 INSTALLATION

A. Manufacturer's Representative must be present during the first 25 percent of Project's installations or as deemed necessary by the Engineer and Owner.

B. Application of first coating layer:
   1. Not more than 2 hours after manhole cleaning and preparation activities.
   2. Excess of 2 hours after manhole cleaning and preparation activities requires repeating water rinsing.

3.3 SAFETY AND VENTILATION REQUIREMENTS

A. Safety and ventilation requirements in accordance with applicable Federal, State, and local regulations.

3.4 SEWAGE FLOW AND DIVERSION

A. Use whatever means necessary to prevent foreign material from entering the sewer lines and/or sewer flows, including diversion box and waste hauler vault.

B. Remove any material from the sewer lines that enters the sewer lines, including diversion box and waste hauler vault, due to Contractor operations at no additional cost to the Owner.

3.5 SURFACE DEFECT REPAIR

A. Repair surface defects including tie holds, honeycombing, or otherwise defective concrete or brick.

B. Fill voids, holes, and rough or irregular surfaces as recommended by the coating manufacturer. Use epoxy mastic or concrete bonding agent as recommended by the manufacturer.

C. Test prepared surfaces after cleaning but prior to application of the coating system to determine a neutral pH of 7 and moisture content of the concrete, as required according to manufacturer's recommendations.

D. Ensure that the moisture content of the surface is in accordance with the coating manufacturer's recommendations and/or requirements.

E. If moisture content of the surface is not in accordance with the coating manufacturer's recommendations and/or requirements, bring surface up to the coating manufacture's recommendations and/or requirements at no additional cost to Owner.

F. Use repair and fill material recommended by the coating manufacturer and approved by the Engineer.
   1. Clean areas to be patched in accordance with manufacturer recommendations.
   2. Remove minor honeycombed or otherwise defective areas to solid concrete to a depth of at least 1 inch.
      a. Cut edges perpendicular to concrete surface.
   3. Apply a bonding agency as recommended by the manufacturer.
   4. Repair concrete with honeycombing which exposes reinforcing steel or with defects that affect structural strength.
      a. Propose repair method to Engineer for review and approval.
   5. Finish patches on exposed surfaces to match the adjoining surfaces after they have set.
   6. Provide finishes equal in workmanship, texture, and general appearance to that of adjacent undamaged concrete.

7. Cement must be cured before coating.

3.6 LINER/COATING APPLICATION

A. Surface coating application:
   1. Do not apply finish coat until other work in the area is complete and until the previous primer or underlayment coat has been inspected, unless otherwise specified.
      a. Request approval authorization at Inspection Hold Points specified in this Section.
   2. Apply coatings in strict accordance with the manufacturer's requirements and recommendations and any specific Owner requirements.
   3. Mix surface coating in a clean, dry mixing container.
   4. Ensure pump, hoses, gun, tip, and pressure tanks are properly matched for the coating to be applied.
   5. Ensure application equipment has been properly cleaned prior to application of coating.
   6. The equipment shall be specially designed to accurately ratio and apply the specified materials and shall be regularly maintained and in proper working order using a log book.
   7. Test spray pattern for uniformity of distribution.
   8. Coating color:
      a. Contrasting color for prime and finish coat, as applicable.
      b. Final coat color as chosen by the Engineer, if different colors are available.
   9. Employ whatever means necessary (e.g., humidity control, temperature control, additional blasting, mechanical surface preparation, etc.) to ensure strong adherence of the surface coating layer to underlying and overlying layers and proper curing of the surface coating layer.
   10. Control time between applications of the various layers to ensure proper bond between layers, if the surface coating is applied in 2 or more layers.
   11. All specified surfaces will be lined with the epoxy system to provide a minimum dry film thickness of 250 mils concrete, depending on the depth of deterioration after cleaning, in order to protect and restore the manhole.
      a. Engineer will verify and measure dry film thickness.
      b. The cured surfacing shall be monolithic with proper sealing of connections to uncoated surfaced areas and shall be placed and cured in 1 application if possible.
      c. If multiple coats are required to achieve the specified thickness, the recoat time cannot exceed manufacturer recommended hours or the surface must be power washed with trisodium phosphate (TSP) at 4,000 pounds per square inch in order to remove amine blush prior to recoating.
   12. Discard compound that has begun to set.
      a. Do not recover compound that has begun to set by adding additional liquid.
   13. Allow drying time between coats as recommended by manufacturer.
   14. Cure coatings in strict accordance with the manufacturer's recommendations, prior to putting into service.

3.7 INSPECTION HOLD POINTS

A. At certain stages in the coating application process, request approval from the Engineer to proceed with the next stage of the installation.
   1. Provide 24-hour notice that approval of an Inspection Hold Point is needed.
   2. Engineer will respond to the approval request within 24 hours.
   3. Failure to receive authorization from the Engineer at one of the designated Inspection Hold Points may prevent the acceptance of the Work by the Engineer on behalf of the Owner.

B. At each manhole, the Engineer will inspect and approve/reject the Work completed to-date at the completion of the following designated Inspection Hold Points for each manhole before the Contractor can commence work on the next Hold Point:
   1. Completion of the cleaning and surface preparation activities.
   2. Completion of void-filling activities and underlayment application (if needed), prior to surface coating application, with the associated adhesion testing of the underlayment layer.
   3. Completion of the surface coating installation prior to testing.
   4. Passing spark testing of the final surface coating.
   5. Passing adhesion testing of the finished coating system.
   6. Final clean-up and inspection.

3.8 ADHESION TESTING

A. Perform adhesion testing in-place and in accordance with ASTM D7234 and as specified in this Section.

B. Engineer will select manholes to be subjected to adhesion testing and specific test locations within each manhole.

C. Engineer will be present to observe each adhesion test.

D. Perform adhesion testing at 2 different stages:
   1. Test adhesion of underlayment layer to underlying substrate before applying surface coating layer.
      a. Test after underlayment layer has cured for a minimum of 4 hours but before surface coating has been applied over underlayment layer.
   2. Test adhesions in the coating system after the surface coating layer has been applied.
      a. Test after finished coating system has adequately cured, as recommended by coating manufacturer, but no more than 4 days.

E. Testing frequency:
   1. Provide at least 3 adhesion tests on every concrete structure rehabilitated. Placement of adhesion test should be 1 at lower, 1 in middle, and 1 at top.
   2. Incomplete tests, described below, do not count in determining compliance with the minimum number of tests required.
      a. Adhesion test failure due to error in performance of adhesion testing (e.g., glue failure with dolly coming off prematurely).
      b. Failure in coating system before required full test pressure is applied (e.g., a

"not pass" test result).

F. Materials and equipment:
   1. Contractor responsible for providing the following materials and equipment:
      a. DeFelsko Positest Adhesion Tester Model AT-CM.
         1) Provide certification that adhesion tester equipment has a current calibration.
      b. DeFelsko dollies: 20 millimeter diameter.
         1) Each adhesion test: 1 dolly, not re-usable.
      c. Adhesive for DeFelsko dollies.
      d. Equipment and tools to core drill around the test location, as specified in this Section.
      e. Log book for recording test data.
         1) Contractor shall record date and time, manhole ID, test location in manhole, coating thickness, pulling stress (pounds per square inch), and failure mode.

G. Testing process:
   1. Glue the dolly to the surface of the manhole at the test location selected by the Engineer.
      a. Optional to lightly sand coating surface with sandpaper at the test location to improve dolly adhesion.
   2. Allow adhesive to set over night.
      a. Test dolly for adhesion to surface of manhole by pulling on it by hand.
         1) If the dolly comes off, re-adhere dolly using different glue, if necessary.
   3. Drill to penetrate through the layers to be tested, but do not penetrate more than 1/16-inch into the underlying substrate.
      a. Core drill manhole surface around the perimeter of dolly using a circle-cutting "hole saw" type drill bit that leaves the center of the drill area intact.
      b. Provide diameter of drilled circle equal, plus or minus 1/8-inch, to test dolly diameter.
   4. Attach adhesion testing machine to dolly.
   5. Test to a minimum 350 pounds per square inch pulling stress for 30 seconds.
      a. Pulling Stress= Pulling Force/(Test Sample Cross-Sectional Area Perpendicular to Applied Force).
      b. DeFelsko adhesion testing machine gauge will read 150 pounds per square inch, which when corrected for dolly diameter equates to 150 pounds per square inch pulling stress.
      c. If delamination or any other failure occurs, the sample failed.
      d. If the dolly comes off the surface of the coating and no other delamination or failure occurs between or within any of the coating system layers and/or the underlying concrete substrate, test is deemed incomplete and the test shall be repeated.
      e. After successful completion of minimum test, continue to raise applied pressure in increments of 50-100 pounds per square inch, hold for 30 seconds and document data. Continue testing to failure and record failure mode and stress.
      f. Engineer may require additional testing and/or remedial action on failed test

at no additional cost to Owner.

1) Remedial action may include removing entire coating system, coating system components installed in manhole to that point, re-cleaning of manhole, re-application of coating system to required surfaces, and re-testing.

6. Mechanically grind down test locations to underlying substrate and re-apply the underlayment and/or coating system, whatever has been installed up to that point in the manhole, as specified in this Section, to patch the area. Wipe off dust and particulates, which act as a bond breaker.
   a. Do not use acetone, MEK or other chemical solvents to dissolve the underlayment or coating system as a substitute for mechanical grinding down of the test area.
7. Contractor shall provide certification that the testing met the minimum requirements of 350 pounds per square inch pulling stress.

3.9 SPARK TESTING

A. Perform spark testing on fully installed coating system in accordance with ASTM D4787 on coated surfaces of each manhole.

B. Engineer will be present to observe and approve each spark test.

C. Provide equipment and materials required for spark testing.
   1. Provide certification that spark testing equipment has a current calibration.

D. Testing process:
   1. Properly clean and prepared manhole.
   2. Engineer will identify grounding bolt installation location around circumferential perimeter of the manhole approximately 12 inches below top point of structure.
   3. Drill a hole no larger than 1/2-inch diameter that penetrates a minimum of 2 inches into the concrete (or other manhole wall surface type). An adhesion test hole can also serve as a location to install the bolt.
   4. Install 3/8-inch diameter stainless steel expansion bolt into the hole.
      a. Bolt penetration minimum: 2 inches into manhole wall.
      b. Bolt exposure minimum length: 1 inch.
      c. Bolt exposure maximum length: 2 inches.
      d. Bolt exposed end: Hex-head end.
      e. The various layers of the coating system shall be installed securely up to and around the base of the bolt to seal the bolt penetration off as a pathway for corrosion.
      f. Bolt will be used during the spark testing to provide grounding.
   5. Do not test with squeegee-type test wand or wet sponge.
   6. Test with wire brush-type test wand with a minimum test voltage of 100 volts per mil (where 1 mil = 1/1000 inch) of finished surface coat thickness.
      a. For example, use minimum 25,000 volts for surface coat thickness of 1/4 inch (250 mils).
      b. Use installed stainless steel bolt as a grounding rod for the spark testing equipment.
   7. Perform quality control test to assure proper functioning of spark testing

equipment, if required by Engineer.

a. Frequency: 1 test may be required for each manhole.
b. Drill a hole through the coating system into the underlying concrete substrate to demonstrate that the spark testing equipment can "find" the hole.
c. Patch and repair the hole as recommended by the coating manufacturer.
d. Unless otherwise determined by the Engineer, any adjustments to the spark testing methodology (e.g., adjusting the grounding method, increasing the test voltage, etc.) required to "find" the known holiday (hole) shall remain in effect for the remainder of the spark testing of that manhole.

8. Spark test entire coated surface of the manhole.
9. Treatment of imperfections found in the coating system using spark testing at no additional cost to Owner.
   a. Grind down and refill.
   b. Do not use acetone, MEK or other chemical solvents to dissolve the underlayment or coating system as a substitute for mechanical grinding down of the imperfection.
   c. Re-test repaired areas until all portions of manhole pass the spark test as specified in this Section.
10. Provide certification for each manhole stating that the coating is free of holes or other imperfections.

3.10 MANUFACTURER'S REPRESENTATIVE

A. Authorized to act on behalf of manufacturer regarding technical and commercial issues.

B. Provide coating installations field inspections.

C. Witness and verify, in writing, that applicator followed the approved Coating System Application plan, as specified in this Section.

3.11 CLEANUP

A. Remove surplus materials, protective coverings, and accumulated rubbish.

B. Thoroughly clean surfaces and repair overspray, splashes, splatters, or other coating-related damage.

C. Clean, repair, and refinish surfaces damaged by clean-up activities to the original or required condition.

END OF SECTION

SECTION 11294

HEAVY-DUTY FABRICATED STAINLESS STEEL SLIDE GATES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Heavy-duty fabricated stainless steel slide gate to be mounted in existing box using existing wall thimble.

B. Related Sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      Section 13446 - Manual Actuators.

1.2 REFERENCES

A. American Water Works Association (AWWA):
   1. C560 - Cast-Iron Slide Gates.
   2. C561 - Fabricated Stainless Steel Slide Gates.

B. ASTM International (ASTM):
   1. A276 - Standard Specification for Stainless Steel Bars and Shapes.
   2. B584 - Standard Specifications for Copper Alloy Sand Castings for General Application.
   3. D1248 - Standard Specification for Polyurethane Plastics Extrusion Materials for Wire and Cable.
   4. D2000 - Standard Classification for Rubber Products in Automotive Applications.
   5. D4020 - Standard Specification for Ultra-High Molecular-Weight Polyethylene Molding and Extrusion Materials.

1.3 DEFINITIONS

A. Slenderness ratio (l/r): The largest ratio obtained by dividing the unsupported length of the stem by the radius of gyration of the stem cross section.

B. Design head: Depth from surface of water to centerline of gate. Use value specified in the gate schedule.

C. Seating head: Pressure applied to gate slide from weight of water column above gate

centerline that forces gate slide into seat.

D. Unseating head: Pressure applied to gate slide from weight of water column above gate centerline that forces gate slide away from seat.

E. Substantially similar:
   1. Similar in size, design head, and service.
   2. Utilizes the proposed design for critical components including guides and seals.

1.4 DESIGN REQUIREMENTS

A. Except as modified or supplemented as specified in this Section, all gates and operators shall conform to the requirements of AWWA C561, latest edition.

B. Gate components:
   1. Frames:
      a. Design for the design head scheduled with a minimum safety factor of 5 with regard to ultimate tensile, compressive, and shear strength.
      b. Self-contained gates: Where frames extend above the operating floor, design to be self-supporting so that no further reinforcing or support is required.
   2. Stem: Select stem diameter, stem guide quantity and stem guide spacing based on following criteria:
      a. Slenderness ratio (l/r): Shall not exceed 200.
      b. Maximum diameter: Provide stem guides at a spacing to maintain stem diameter of 2 inches or less.
      c. Tensile strength: Suitable to withstand the force generated by the operator with the application of a 200 pound force applied to the crank or handwheel or a 250 foot-pound torque applied to the wrench nut.
      d. Compressive strength:
         1) Suitable to withstand buckling due to the force generated by the operator with the application of an 80 pound force applied to the crank or handwheel or a 100 foot-pound torque applied to the wrench nut.
         2) Determine buckling load using Euler Column formula in accordance with AWWA C 561, where C = 2.
   3. Thrust nut: Suitable to withstand thrust developed by operator with the application of a 40 pound force on the crank or handwheel with safety factor of 5. Base design on ultimate strength of material used.
   4. Yokes for self-contained gates:
      a. Design yoke using design loading criteria for stem with safety factor of 5 based on the ultimate strength of the material used.
      b. Maximum deflection at design load: Not to exceed 1/360th of the span.
   5. Slide:
      a. Deflection shall be less than or equal to 1/1000 of the span of the gate or 1/16 inch, whichever is less, when under the design head.
      b. Design for the maximum design head specified with a minimum safety

factor of 5 with regard to ultimate tensile, compressive, and shear strength.

1.5 PERFORMANCE REQUIREMENTS

A. Maximum allowable leakage shall be 0.10 gallons per minute per foot of sealing perimeter, the allowable limits set forth in AWWA C561. Leakage testing shall be conducted in accordance with AWWA C561.

1.6 SUBMITTALS

A. Submit as specified in Section 01330 - Submittal Procedures.

B. Calculations:
   1. Gate opening and closing thrust forces that will be transmitted to the support structure with operator at extreme positions and load.
   2. Torque required to open and close the gate, including maximum torque at any point along gate travel. Indicate thrust value and stem factor.
   3. Breakaway torque from seat. Indicate thrust value and stem factor.

C. Manufacturer's operation and maintenance manuals, 3 hardcopy sets in tabbed binders.

D. Manufacturer's installation instructions.

E. Commissioning submittals:
   1. Provide Manufacturer's Certificate of Installation and Functionality Compliance.

F. Shop drawings:
   1. Layout and installation drawings for each gate size and type.
   2. Existing wall thimbles layout.
   3. Manual actuator
   4. Size and material of all anchorage components and fasteners.
   5. Submit calculations and design data substantiating conformance with the Drawings and Specifications.
   6. Gate opening and closing thrust forces that will be transmitted to the support structure with operator at extreme positions and load.
   7. Torque required to open and close the gate, including maximum torque at any point along gate travel. Indicate thrust valve and stem factor.
   8. Breakaway torque from seat. Indicate thrust valve and stem factor.

1.7 WARRANTY

A. Provide Manufacturer's standard warranty as specified.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: One of the following or equal.
   1. Golden Harvest, Series GH-100.
   2. H. Fontaine, Series 20.
   3. Waterman Ind., Sentinel, III.
   4. Rodney Hunt Co., Series 600.
   5. Whipps, Inc., Series 900.

B. Operator: Provided by manufacturer of slide gates.

2.2 MATERIALS

A. Stainless steel: ASTM A276, Type **316**:
   1. Components or structural shapes which are welded: ASTM A276, Type **316L**.
   2. All wetted and unwetted parts including all fasteners and hardware, except as specified in this Section, shall be stainless steel.

B. Ultra-high molecular weight polyethylene: ASTM D1248 and D4020.

C. Neoprene: ASTM D2000, Grade 2 BC 510.

D. Manganese bronze: ASTM B584, UNS Number C86500 or Alloy 432.

E. Silicon bronze: ASTM B584 UNS Number C87300.

2.3 COMPONENTS

A. Slide:
   1. Type 316L stainless steel.
   2. Rectangular or square.
   3. Fabricated with a flat plate reinforced with formed plates or structural members.

B. Frame:
   1. Construct gate frame of Type 316L stainless steel structural members or formed plate welded to form a rigid 1-piece frame.
   2. Mounting: To match existing gate.
   3. Adjustable ultra-high molecular weight polyethylene pressure pads.
   4. Flush bottom type unless otherwise indicated on the Drawings.
   5. Allow replacement of top, side, and bottom seals without removing the gate frame from concrete or wall thimble.
   6. Machine surfaces matching with thimble. Provide seal between gate frame and thimble that will meet leakage performance requirements.
   7. Embedded gates: Extend frame to provide access to pressure pad adjusting screws (For seal design alternatives A and B only).

C. Yoke for self-contained gates:
   1. Type 316L stainless steel.
   2. Extend guides and frame so that bottom of yoke is at least 12 inches above top of slide at full open position.
   3. Bolt or weld to frame.

4. Provide mounting plate on top of yoke to mount operator.
5. Design yoke to allow removal of gate slide. a.

D. Guides:
1. Type 316L stainless steel with ultra-high molecular weight polyethylene insert in contact with gate.
2. Minimum face width of 1 inch.
3. Length: To support the slide fully in the open position.
4. Anchor bolts shall not pass through the guides and seals.

E. Seals:
1. Designed to achieve the specified leakage requirements.
2. Sealing and sliding surfaces shall provide a low coefficient of friction with the surface of the slide.
3. Field replaceable without removing gate from concrete or wall thimble.
4. Anchor bolts shall not pass through the guides and seals.
5. J-bulb seals are not acceptable.
6. Minimum seating surface width: 3/4 inch in contact with slide.
7. Bottom seal:
   a. Resilient neoprene, minimum durometer of 45.
   b. Attached to the bottom of the slide or embedded in gate frame invert.
8. Side and top seals:
   a. Provide one of the seal design alternatives listed below.
   b. Seal design alternative A:
      1) UHMWPE fixed sealing surfaces that surround the clear opening.
      2) Held in place in the guide with Type 316 stainless steel fasteners.
      3) Seal compression shall be maintained by UHMWPE field adjustable pressure pads mounted to the slide with Type 316 stainless steel fasteners.
   c. Seal design alternative B:
      1) Neoprene crown seal with UHMWPE bearing bars.
      2) Attached to the slide with Type 316 stainless steel fasteners.
      3) Crown seal shall be actuated by water pressure in either the seating or unseating direction.
      4) Primary contact with the slide shall be through the UHMWPE bearing bar. The neoprene shall not be solely relied upon for the contact seal.
      5) Seal compression may be maintained by UHMWPE field adjustable pressure pads mounted to the guide with Type 316 stainless steel fasteners.
   d. Seal design alternative C:
      1) UHMWPE self-adjusting type seals: Utilize a continuous compression cord to ensure contact between the seals and the slide.
      2) Side seals:
         a) Attach to frame using one of the following approaches.
            (1) Held in place between the front and back angles of the guide with Type 316 stainless steel bolts passing through the guide and seal along the length of the guide.
            (2) Held in place between front and back of a formed, 1 piece, rigid channel guide. Attach seals to frame using Type 316 stainless

steel bolts.

b) Design and installation shall provide access to and removal of the bolt to allow removal of the side seal without removing the gate from the concrete.

3) Top Seal: UHMWPE self-adjusting type seal with double compression cord.

F. Stem:
1. Type 316 stainless steel.
2. Machine cut or rolled threads.
3. Stem couplings:
   a. Silicon bronze or Type 316 stainless steel.
   b. Threaded and keyed to stem or threaded and bolted to stem.
4. Stem guides:
   a. Type 316 stainless steel.
   b. Split collar.
   c. Adjustable in 2 directions.
   d. Ultra-high molecular weight polyethylene bushing.
5. Provide manganese bronze stop collar on stem above actuator.
6. Drill and connect stem to slide structural sections with Type 316 stainless steel bolts.
7. Minimum Stem Diameter: 1-1/2 inch.
8. Coordinate the selection of the gate stem configuration with the gate operator and operating speed.
   a. The selected gate stem configuration shall provide the most efficient combination of stem diameter/pitch/lead and keep the operating temperature at the stem nut to a minimum during operation.
   b. For motorized applications, if the proposed gate stem configuration would result in any deviation from the operating rise rate specified in Section 13447 - Electric Actuators, submit proposed deviation for approval by the Engineer.

G. Operating nut:
1. Locate at operator level.
2. Material: Manganese bronze.

H. Gate operators: As specified in Section 13446 - Manual Actuators.

I. Bolts, nuts, and fittings: Type 316 stainless steel.

J. Anchor bolts:
1. Type 316 stainless steel.

2.4 WALL THIMBLES

A. Utilize the existing wall thimble, as indicated on the drawings

2.5 FINISHES

A. Stainless steel:

1. Shot blast gates and wall thimbles after fabrication to remove weld splatter and to polish scratches.
2. Clean the entire surface to produce an even color and sheen.

B. Operators, stands, and other accessory equipment: Surface preparation, factory prime, field prime, and finish coats, 100% high solids epoxy.

2.6 FABRICATION

A. Shop assembly:
1. Gates shall be factory assembled, adjusted, and tested.
2. Mount all accessories and appurtenances including, but not limited to, motor operators and limit switches so that the complete system may be tested at the factory.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mount gate plumb in both vertical planes and level in horizontal plane on existing thimble.

B. Coat seating surfaces between frame and wall thimble with a waterproof plastic compound or provide EPDM gasket prior to tightening frame studs.

C. Utilize existing stem penetration sleeve in diversion box for stem installation.

D. Face mounted gates:
1. Use existing wall thimbles, mount gate to wall thimble utilizing existing stud anchors. If existing studs cannot be reused, provide new with anchor bolts in accordance with manufacturer's recommendations.

3.2 COMMISSIONING

A. As specified in Section 01756 - Commissioning and this Section.

B. Manufacturer services:
1. Provide certificates:
   a. Manufacturer's Certificate of Installation and Functionality Compliance.
2. Manufacturer's Representative onsite requirements:
   a. Installation: **1** trip, **1** day minimum.
   b. Functional Testing and Maintenance Training: **1** trips, 1 day minimum each.

C. Functional testing:
1. Equipment:
   a. Test witnessing: Witnessed.
   b. Leakage tests:
      1) Conduct in accordance with AWWA C 561. Comply with specified

allowable leakage limits

2) After gate installation and checking, run gates through at least 2 full cycles from the closed position to full open position and back to the closed position.

3.3 SCHEDULE

A. The Slide Gate Schedule is included on the following page. The Slide Gate Schedule is not a take-off list.

HEAVY-DUTY FABRICATED STAINLESS STEEL SLIDE GATE SCHEDULE

Gate Tag Number or Mark Number	Drawing Number	Location	Opening Size W X H (inches)	Wall Opening Shape	Gate Opening Direction	Type of Closure[1]	Gate Design Pressure[2]		Gate Mounting[3]	Type of Frame[4]	Stem Type[5]	Type of Operator[6]	Minimum Gate Travel (inch)
							Seating (feet)	Unseating (feet)					
SG14101	See Exhibits	Diversion Box	48-inch	Square	Up	STD	13	13	Existing FWT	SC	RS	CO	48-inch

Notes:

(1) Closure: DO = Downward Opening; FB = Flush Bottom; STD = Standard.

(2) Gate design pressure applied at centerline of gate.

(3) Mounting: FM = Face Mounted; EC = Inside Existing Channel; EMB = Embedded; SP = Spigot back; FWT = "F" Wall Thimble; EWT = "E" Wall Thimble; See Typical Details P716 and P717 for additional installation details.

(4) Frame: SC = Self-Contained; NSC = Non-Self Contained; F = Flatback; FL = Flange back.

(5) Stem: RS = Rising Stem; NRS = Non-Rising Stem.

(6) Operator: CO = Hand crank operator with 2-inch AWWA nut for portable operator; HW = Handwheel; HC = Hand crank; MO = Motor Operator; MOD = Modulating Motor Operator; HO = Hydraulic Operator; MHO = Manual Hydraulic Operator (Hand Pump); BS = Bench Stand; FS = Floor Stand; IFS = Interconnect Floor Stand; PS = Pedestal Support.

END OF SECTION

SECTION 13446

MANUAL ACTUATORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Gate actuators.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
   3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
      a. Section 05190 - Mechanical Anchoring and Fastening To Concrete And Masonry.

1.2 REFERENCES

A. Aluminum Association (AA):
   1. DAF-45 - Designation System for Aluminum Finishes.

B. American Water Works Association (AWWA).

1.3 SUBMITTALS

A. Shop drawings: Include shop drawings for hydraulic gate lifts with shop drawings for gates as integrated units.

1.4 QUALITY ASSURANCE

A. Provide valve actuators integral with valve or gate, except for valve actuators utilizing T-wrenches or keys, and portable actuators intended to operate more than 1 valve.

B. Provide similar actuators by 1 manufacturer.

C. Provide gates and hand operating lifts by 1 manufacturer.

1.5 MAINTENANCE

A. Extra materials:
   1. Hand crank operator for floor stand: Furnish one hand crank for each floor stand.
   2. Key operated valve keys or wrenches: Furnish a minimum 4 keys with 4-foot

shafts and 3-foot pipe handles or wrenches with 4-foot shafts and 3-foot handles for operating key operated valves.

PART 2 PRODUCTS

2.1 GATE ACTUATORS

A. Stem covers:
   1. Ultraviolet light resistant, clear butyrate plastic or polycarbonate pipe:
      a. Capped on the upper end.
      b. Either threaded into the top of the gate operators or held in place by bolt-down aluminum brackets.
      c. Capable of covering threaded portion of greased stems that project above actuators when gates or valves are opened or closed.

B. Stem cover flanges, pipes and caps:
   1. After fabrication, etch and anodize to produce the following chemical finishes in accordance with AA publication DAF-45:
      a. A 41 - Clear Anodic Coating.
      b. C 22 - Medium Matte Finish.

C. Gate stem covers: Concentric with stem.

D. Position indicators:
   1. Tail rods on hydraulic cylinders, or dial indicators with clear full-open and closed position indicators, calibrated in number of turns or percentage of opening.

E. Manual actuator size:
   1. Sized to deliver maximum force required under most severe specified operating condition, including static and dynamic forces, seat and wedge friction, and seating and unseating forces with safety factor of 5, unless otherwise specified.

F. Actuator size: Capable of supporting weight of suspended shafting unless carried by bottom thrust bearings; shaft guides with wall mounting brackets.

G. Provisions for alternate operation: Provide tool less removal of crank, for alternate operation with portable gate actuator (drill) with a shaft adapter.

H. Operation: Counterclockwise to open with suitable and adequate stops, capable of resisting at least twice normal operating force to prevent overrun of valve or gate in open or closed position.

I. Open direction indicator: Cast arrow and legend indicating direction to rotate actuator on handwheel, chain wheel rim, crank, or other prominent place.

J. Worm gear actuators: Provide gearing on worm gear actuators that is self-locking with gear ratio such that torque in excess of 160 foot-pounds will not need to be applied to operate valve at most adverse conditions for which valve is designed.

K. Traveling nut actuators: Capable of requiring maximum 100 foot-pounds of torque when operating valve under most adverse condition; limit stops on input shaft of manual actuators for fully open and closed positions; non-moving vertical axis of operating nut when opening or closing valve.

2.2 HAND-CRANKED GEARED ACTUATORS

A. Type: Single removable crank; fully enclosed.

B. Mounting: Floor and bench stand. Unless otherwise indicated on the Drawings position actuator 36 inches (nominal) above top of walkway surface.

C. Operating nut: When scheduled for portable actuators.

D. Geared lifts: 2-speed with minimum ratio of 4 to 1.

E. Teeth on gears, spur pinions, bevel gears, and bevel pinions: Cut.

F. Lift nuts: Cast manganese bronze.

G. Exterior surfaces on cast-iron lift parts: Smooth.

H. Bearings above and below flange on lift nuts: Ball or roller; capable of taking thrust developed by opening and closing of gates under maximum operating head; with bronze sleeve bearings and sufficient grease fittings for lubrication of moving parts, including bearings and gears.

I. Crank rotation indicator: Cast arrow with word OPEN in prominent location readily visible indicating correct rotation of crank to open gate.

J. Hand cranks: 15-inch radius; requiring maximum 25 pounds pull to operate gate at maximum operating head; with:
   1. Revolving brass sleeves.
   2. Gears, spur pinions, bevel gears, and bevel pinions with cut teeth.
   3. Cast manganese bronze lift nuts.
   4. Cast-iron lift parts with smooth exterior surfaces.

K. Indicator: Dial position type mounted on gear actuator; enclosed in cast-iron or aluminum housing with clear plastic cover; marked with fully open, 3/4, 1/2, 1/4, and closed positions.

2.3 FLOOR STAND

A. Manufacturers: by slide gate Manufacturer.

B. Floor stand assemblies: Heavy-duty cast-iron, suitable for mounting specified actuator.

2.4 BENCH STANDS

A. Manufacturers: by slide gate Manufacturer.

B. Bench stands: Handwheel actuators or hand crank, geared actuators conforming to hand-cranked geared actuator requirements, except capacity to be mounted on haunch, wall bracket, or self-contained gate yoke.

2.5 ACCESSORY EQUIPMENT

A. Wall brackets or haunches: As required by gate design.

B. Stems: Stainless steel; sized to match output of actuator; minimum gate or valve operating stem diameter; maximum 200 slenderness ratio.

C. Stem couplings: Stainless steel; internally threaded to match stem; lockable to stem by set screw.

D. Stem guides: Cast-iron with silicon bronze bushing; maximum 200 slenderness ratio; capable of being mounted with wall bracket; adjustable in 2 directions.

E. Wall brackets: Cast-iron, capable of withstanding output of actuator, adjustable in 2 directions.

F. Stem stuffing boxes: Cast-iron, with adjustable gland and packing.

G. Fasteners: Type 316 stainless steel.

H. Anchor bolts: As specified in Section 05190 except that the material shall be Type 316 stainless steel.

I. Geared valve actuators: Provided with cut gears, either spur or worm; sized to operate valves at most adverse design condition; with maximum 40-pound pull at handwheel or chain wheel rim.

J. Geared valve traveling nut actuators: Acceptable only where specified or indicated on the Drawings.

K. Accessory equipment for valves and gates requiring remote actuators: Operating stems, stem couplings, stem guides, wall brackets, and stem stuffing boxes.

PART 3 EXECUTION

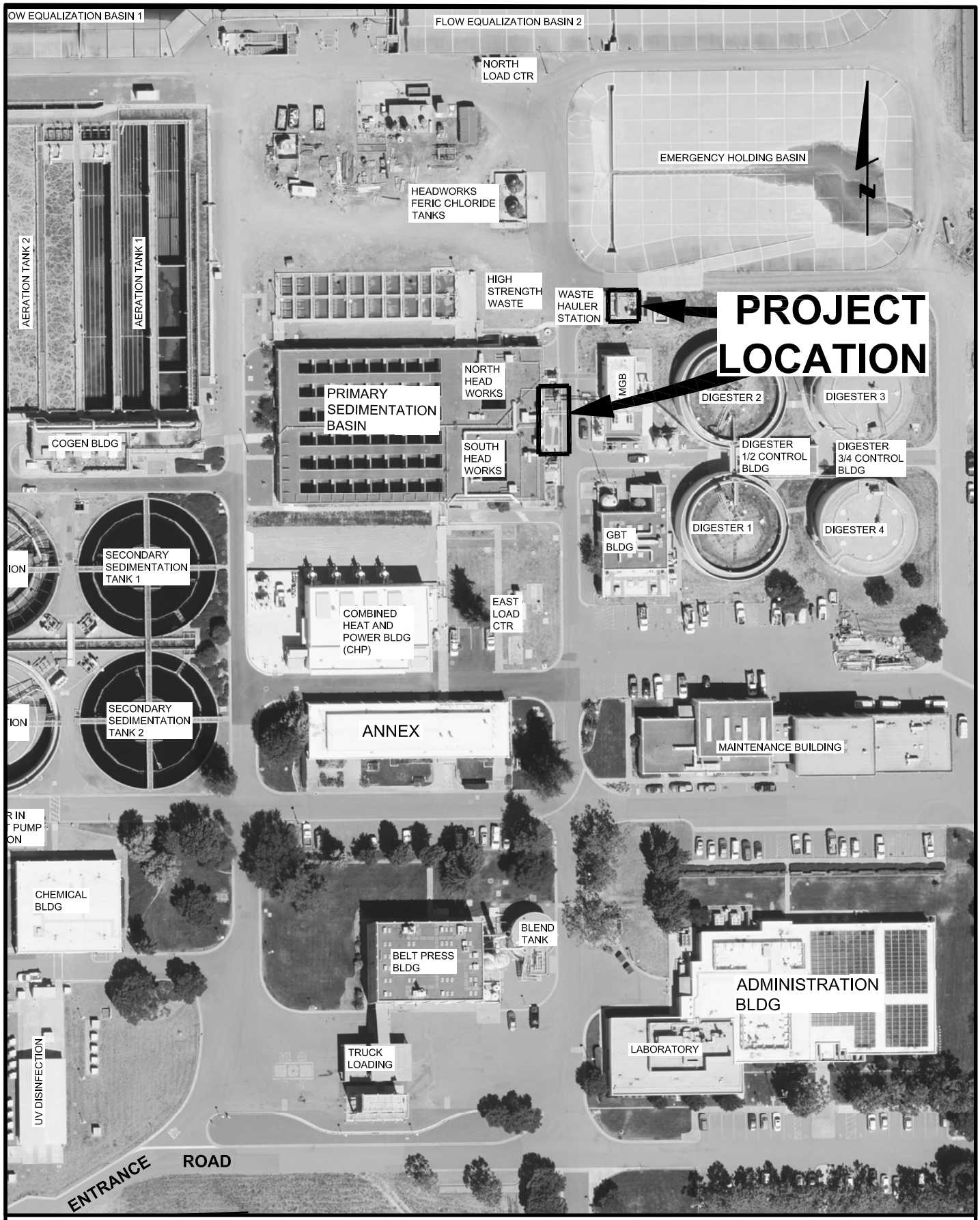
3.1 INSTALLATION

A. After installation of gate and stem covers, mark stem covers at point where top of stems are at full-open position and at closed position.

B. Attach floor stand to structure with anchor bolts.

C. Install stem stuffing boxes where operating stems pass through intermediate concrete floor slabs.

END OF SECTION



LAGUNA TREATMENT PLANT
PROJECT LOCATION MAP

City of Santa Rosa

NOT TO SCALE

EXHIBIT 1

TOP OF INFLUENT DIVERSION BOX

INSIDE OF INFLUENT DIVERSION BOX

LAGUNA TREATMENT PLANT PHOTOS

City of Santa Rosa

NOT TO SCALE

EXHIBIT 2

GENERAL NOTES:

1. THIS DRAWING HAS BEEN PRODUCED FROM SCANNED EXISTING RECORD DRAWING. THE PURPOSE OF THE SCANNED RECORD DRAWING IS TO SHOW EXISTING ITEMS THAT WILL BE REHABILITATED UNDER THIS PROJECT. KEY NOTE CALLOUT'S ON THE SCANNED DRAWINGS IDENTIFY THE ITEMS TO BE REHABILITATED. THE ORIGINAL DRAWING IS AVAILABLE FROM OWNER FOR CONTRACTOR'S REFERENCE. WHERE POSSIBLE, A FIELD VERIFICATION WAS PERFORMED AND MAJOR DEVIATIONS HAVE BEEN NOTED. CONTRACTOR SHALL MAKE SUCH INVESTIGATIONS AS NECESSARY TO SATISFY THEMSELVES AS TO FIELD CONDITIONS.

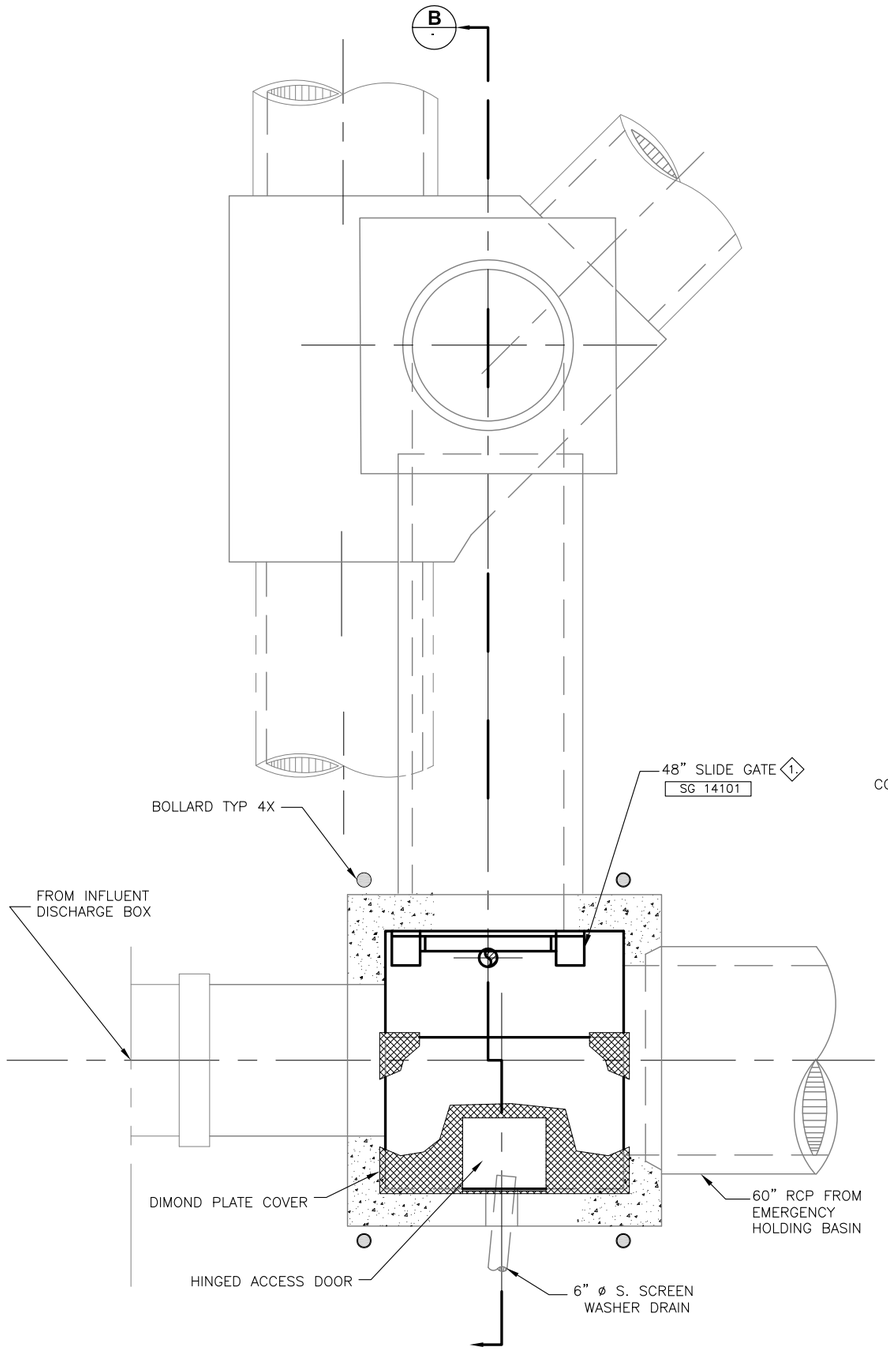
2. NOT ALL EXISTING EQUIPMENT PIPING AND CONDUITS ARE SHOWN. ALL EXISTING DIMENSIONS ARE ELEVATIONS ARE APPROXIMATE BASED ON AVAILABLE INFORMATION CONTRACTOR SHALL FIELD VERIFY ALL SITE CONDITIONS. DIMENSIONS, AND EXISTING ELEVATIONS PRIOR TO STARTING WORK IN THIS AREA. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES FOUND.

3. ACCESS TO THE INFLUENT BOX IS LIMITED AND CONSIDERED A CONFINED SPACE. ISOLATION OF BOX IS REQUIRED TO PROTECT WORKERS.

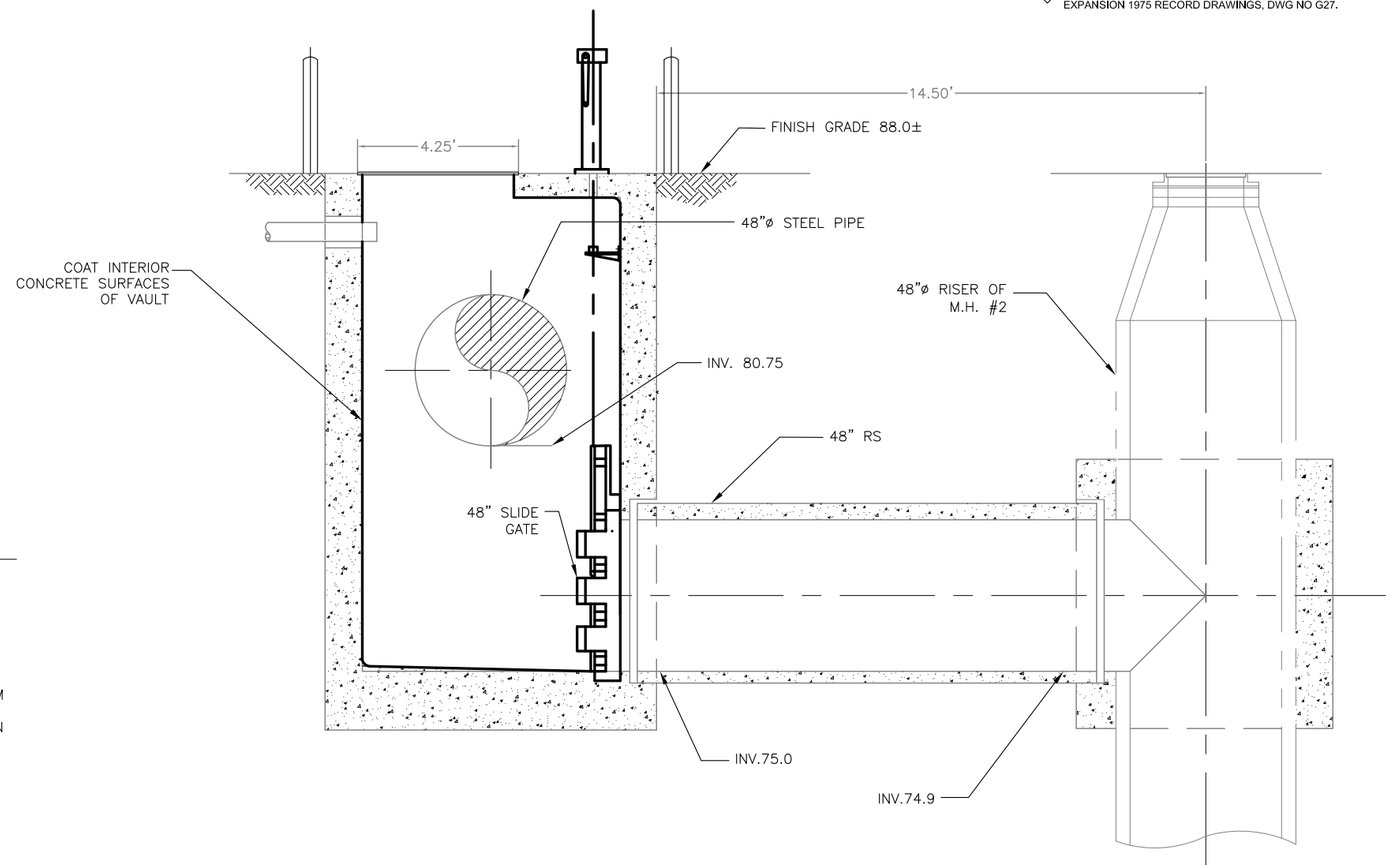
KEY NOTES:

1. REPLACE GATE, STEM GUIDES, OPERATOR, AND ALL OTHER APPURTENANCES. PROVIDE NEW 48-INCH SLIDE GATE. PER SPECTIFICATIONS. USE EXISTING WALL THIMBLE AND ANCHOR BOLTS, WHERE POSSIBLE. MATCH EXISTING GATE CONFIGURATION. ORIGINAL SHOP DRAWINGS FOR THE GATE ARE AVAILABLE FROM THE OWNER FOR CONTRACTOR'S REFERENCE. THE EXISTING GATE HAS A WALL THIMBLE. FIELD VERIFY EXISTING PIPE INVERT ELEVATION, SIZE AND MOUNTING CONDITIONS PRIOR TO MANUFACTURING GATE.

2. REFERENCE DRAWINGS FROM SECONDARY TREATMENT EXPANSION 1975 RECORD DRAWINGS, DWG NO G27.



2 A **PLAN - INFLUENT DIVERSION BOX**
SCALE: 1/4"=1'-0"
FILE: R8871F10M001A



2 B - **SECTION**
SCALE: 1/4"=1'-0"
FILE: R8871F10M001A

City of Santa Rosa

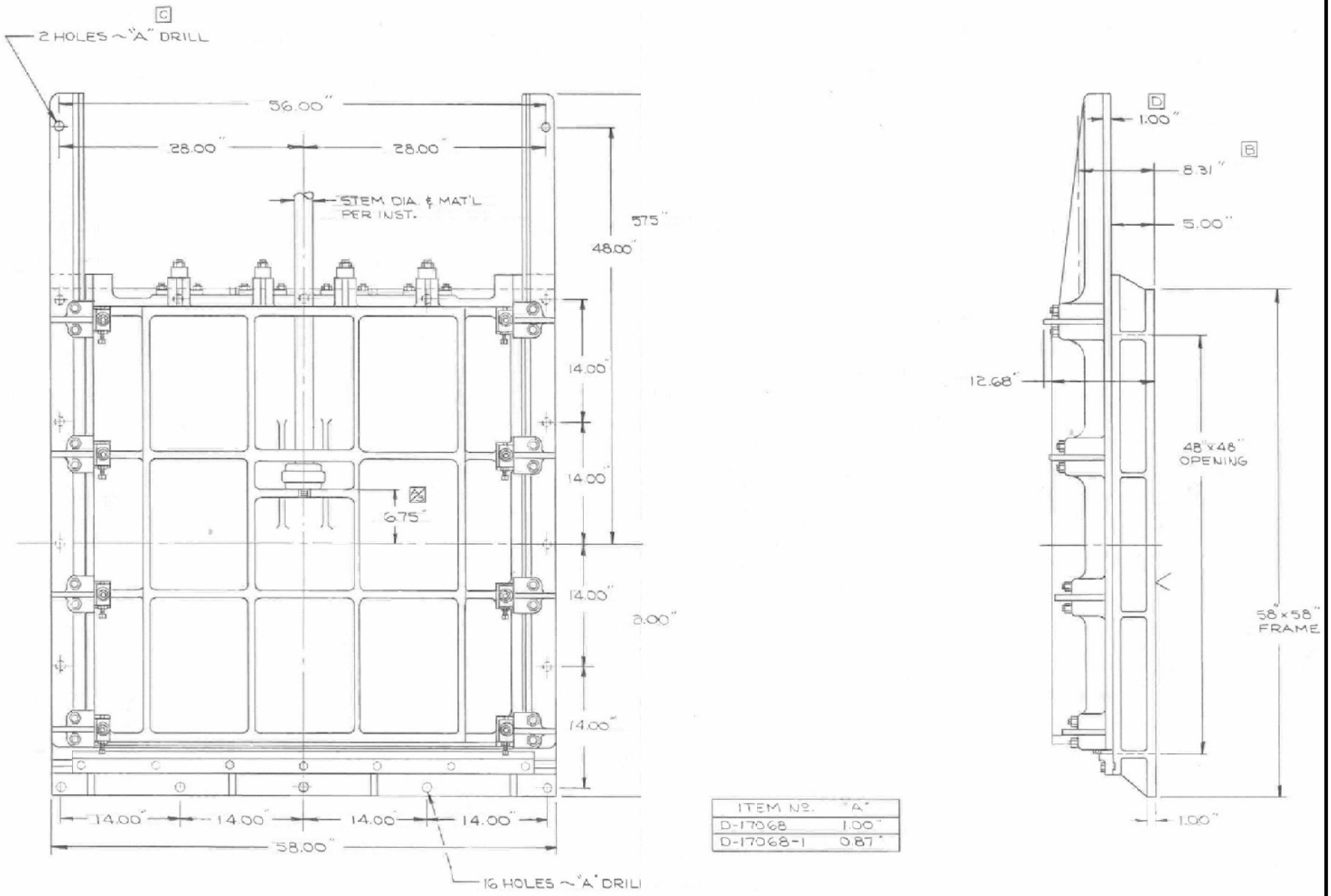
EXISTING GATE PLAN AND SECTION

SCALE AS SHOWN

D:\LtProjects\LTP c2270 Gate Replacement Influent Diversion Box\CAD\[Exhibit 3 IDB Plan & Section.dwg, 3/11/2020 1:00:05 PM, Plot Style: IW ACAD 2020.ctb

EXHIBIT 3

C02270



ITEM NO.	"A"
D-17068	1.00"
D-17068-1	0.87"

EXISTING GATE
FRONT AND SIDE VIEW

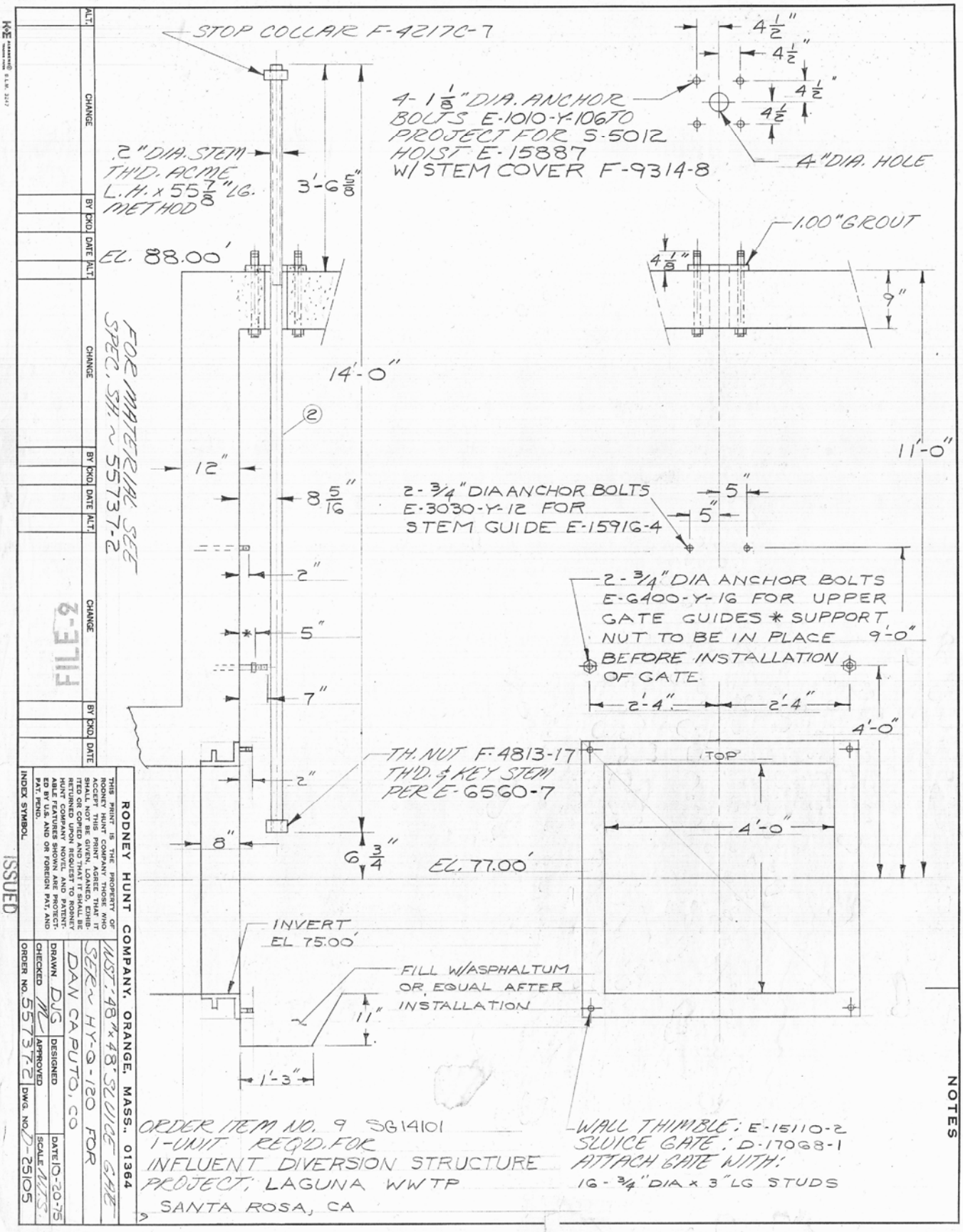
NOT TO SCALE

City of Santa Rosa

EXHIBIT 4

C02270

129

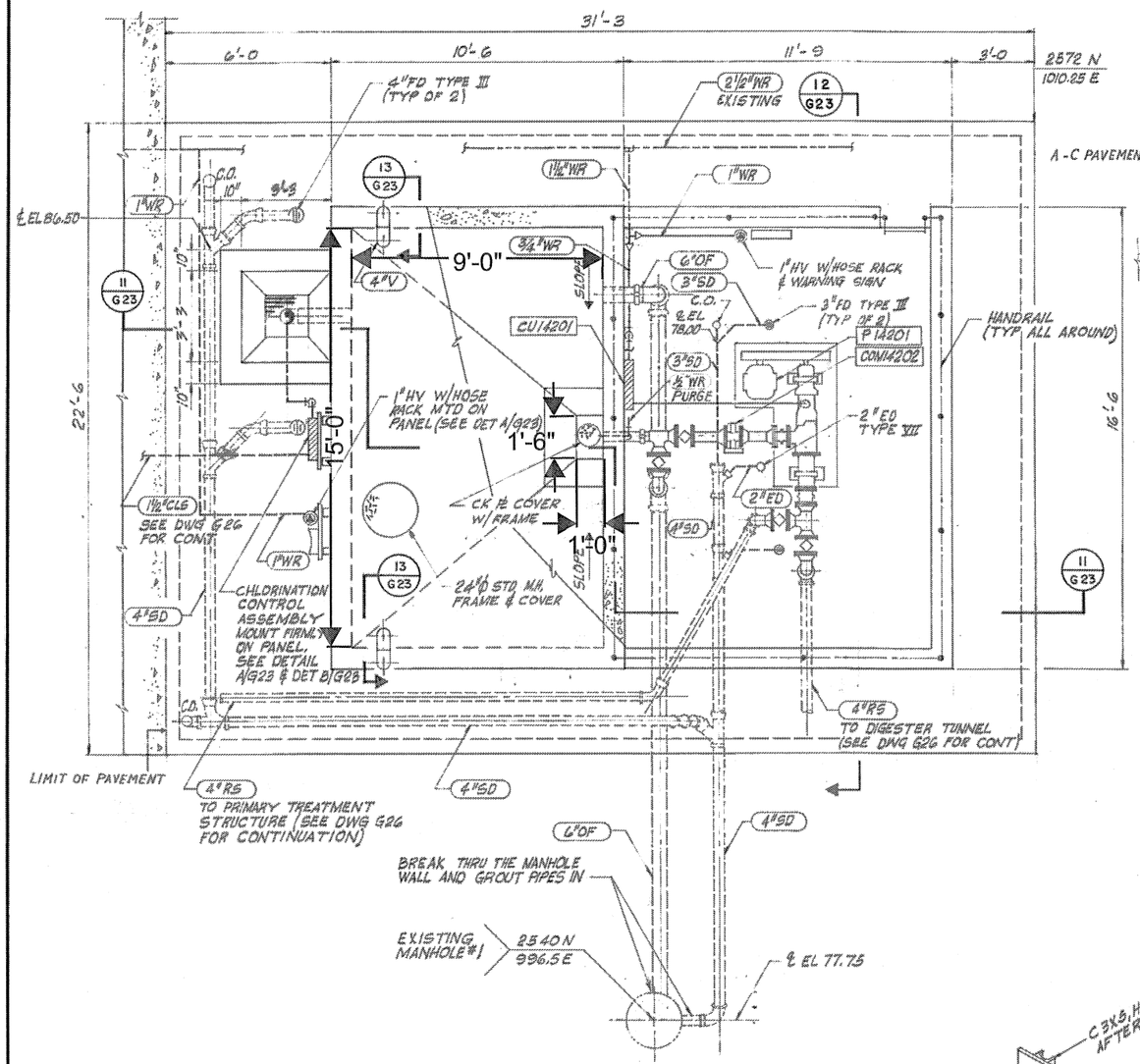


EXISTING GATE SHAFT AND THIMBLE

NOT TO SCALE

City of Santa Rosa

EXHIBIT 5



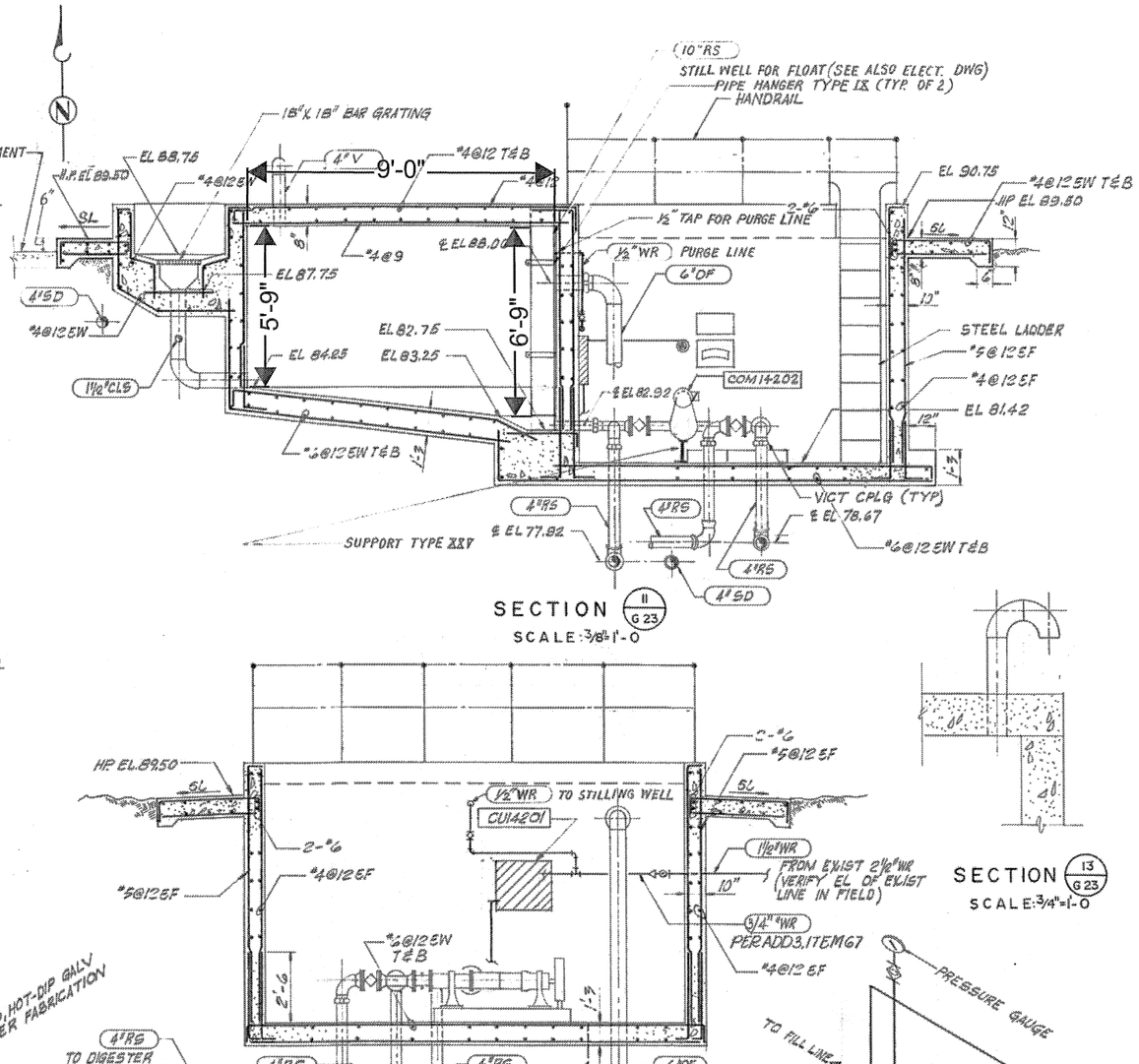
PLAN

PRETREATMENT FACILITY

SCALE: 3/8" = 1'-0

EQUIPMENT LIST

P 14201	PRETREATMENT EFFLUENT PUMP
P 14202	INLINE COMMINUTOR



SECTION 11 G23

SCALE: 3/8" = 1'-0

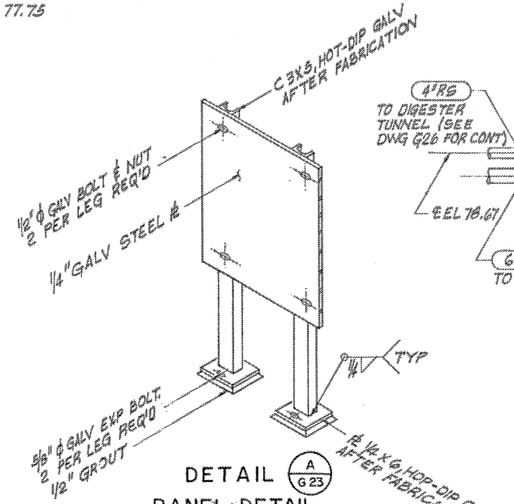
SECTION 12 G23

SCALE: 3/8" = 1'-0

CHLORINATION CONTROL ASSEMBLY

DETAIL B G23

NO SCALE



DETAIL A G23

PANEL DETAIL

NO SCALE

THIS DRAWING CORRECTED AS CONSTRUCTED

THIS DRAWING REDUCED TO HALF SIZE

REGISTERED CIVIL ENGINEER DAVID H. CALDWELL No. 6287 STATE OF CALIFORNIA

EXHIBIT 6

DRAWN R.G. LEONARDO CHECKED P.A./Y.S.	DESIGNED Y.K.S. Tenbar Awwas SUBMITTED Robert L. Mills	APPROVED Brown and Caldwell 6/2/75 Date APPROVED For City of Santa Rosa 6-2-75 Date	BROWN AND CALDWELL CONSULTING ENGINEERS WALNUT CREEK, CALIFORNIA PASADENA, CALIF. • EUGENE, ORE.	FILE F 399 A DATE NOV. 1974	CITY OF SANTA ROSA, CALIFORNIA LAGUNA WASTEWATER TREATMENT PLANT 1974 SECONDARY TREATMENT EXPANSION	GENERAL SEPTIC TANK SEWAGE PRETREAMENT FACILITY AND EQUIPMENT LIST	SANTA ROSA FILE NO. 75-1	SHEET NUMBER 25 OF 322 DRAWING NUMBER G 23

C I T Y O F S A N T A R O S A

STATE OF CALIFORNIA

LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

The work to be performed and referred to herein is in the City of Santa Rosa, California and consists of improvements to be constructed in accordance with the provisions of the Invitation for Bids, containing the Notice to Bidders, the Special Provisions, the Project Plan(s), the Bid Forms and the Contract, all of which are by reference incorporated herein, and each Addendum, if any is issued, to any of the above which is also incorporated by reference herein.

TO THE AWARD AUTHORITY OF THE CITY OF SANTA ROSA

The undersigned, as bidder, declares that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any other person, firm, or corporation; that Contractor has carefully examined the Project Plans, Invitation for Bids and conditions therefor, and is familiar with all bid requirements, that Contractor has examined this Contract and the provisions incorporated by reference herein, and Contractor hereby proposes, and agrees that if its bid is accepted by the City, Contractor will provide all necessary machinery, tools, apparatuses, and other means of construction, and to do all the work and furnish all the materials and services required to complete the construction in accordance with the Contract, the Special Provisions, the Project Plan(s), and Addenda to any of the above as incorporated by reference, in the time stated herein, for the unit prices and/or lump sum prices as follows:

Name of Bidder: _____

CITY OF SANTA ROSA
LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

Item No.	Description	Quantity	Units	Unit Price	Total Price
1	INFLUENT DIVERSION BOX INSPECTION, SURFACE PREP &	1	LS	$	$
2	COATING INFLUENT DIVERSION BOX GATE REPLACEMENT	1	LS	$	$
3	WASTE HAULER VAULT INSPECTION, SURFACE PREP & COATING	1	LS	$	$

TOTAL BID: **$**_____

In the case of any discrepancy between the unit price and the total set forth for the item, the unit price shall prevail; provided, however, that if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any reason, or is omitted, or in the case of lump sum items, is not the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail in accordance with the following:

1. As to lump sum items, the amount set forth in the "Total" column shall be the unit price;

2. As to unit basis items, the amount set forth in the "Total" column shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

The Total Base Bid shall be the sum of the "Total" column. In case of discrepancy between the sum of the "Total" column and the amount entered as Total Base Bid, the sum of the "Total" column shall prevail. The bid comparison will be based on the sum of the "Total" column for each bidder.

If this Contract Bid is accepted by the City and the undersigned fails to execute the Contract and to give all the bonds required under the Contract, with a surety satisfactory to the Award Authority of the City of Santa Rosa, within ten calendar days after bidder has received the Notice of Award from the Engineer, then the Award Authority may, at its option, determine that the bidder has abandoned the Contract, and thereupon this bid and the acceptance thereof shall be null and void, and the forfeiture of the security accompanying this bid shall be in accordance with California Public Contract Code section 20172.

The undersigned understands and agrees that the City is not responsible for any error or omissions on the part of the undersigned in making this bid.

The bidder to whom the Contract is awarded agrees to execute the Contract in favor of the City, in the form attached, and to deliver any and all required bond(s) and insurance certificates within ten calendar days from the date of Contractor’s receipt of the Notice of Award. Following the award of the Contract, Contractor shall commence work within ten calendar days from the day authorized in the Notice to Proceed and diligently prosecute the same to completion in accordance with Section 8-1.04.

LIST OF SUBCONTRACTORS

NAME OF BIDDER: _____

The following is a list of each subcontractor who will perform work or labor or render services to the undersigned for the construction of the project in an amount in excess of ½ of 1% of the total amount of this bid.

The undersigned agrees that any portion of the work in excess of ½ of 1% of the total amount of this bid and for which no subcontractor is designated herein will be performed by the undersigned.

SUBCONTRACTOR NAME	SUBCONTRACTOR LICENSE NUMBER	SUBCONTRACTOR DIR REGISTRATION NUMBER	SUBCONTRACTOR BUSINESS ADDRESS	DESCRIPTION OF WORK (ITEM NO.)

LIST OF PREVIOUS SIMILAR JOBS

NAME OF BIDDER: _____

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

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

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

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

NOTE: The above Noncollusion Declaration is part of the Contract Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Noncollusion Declaration.

BID BOND AFFIDAVIT AND BIDDER'S SIGNATURE PAGE

Accompanying this bid is a guaranty in the form of (Notice: Insert the words "cash $," "Cashier's Check," "Certified Check," or "Bidder's Bond" as the case may be):

_____

in an amount equal to at least ten percent of the total of this bid.

The undersigned further agrees that if Contractor does not execute the Contract and deliver the necessary bonds to the City within the period of time specified in this Invitation for Bids, the proceeds of the security accompanying this bid shall become the property of the City of Santa Rosa, California, and this bid and the acceptance thereof may, at the option of the City, be considered null and void.

The undersigned is licensed in accordance with an act providing for the registration of Contractors, License No. _____, Class _____, expiration date _____.

The undersigned in registered with the Department of Industrial Relations, Registration No. _____.

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager of the corporation; if a partnership, state true name of partnership, also the names of all partners in the partnership; if the bidder is a sole proprietor, state the business name and the proprietor's name in full.

Secretary of State Business Entity Number: _____.

_____

_____

_____

_____

Business Address

_____

Telephone Number

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

BIDDER'S SIGNATURE: _____

TITLE: _____

DATE: _____

CONTRACT

CITY OF SANTA ROSA

CALIFORNIA

CONTRACT NO. C02270
LAGUNA TREATMENT PLANT INFLUENT DIVERSION BOX GATE AND COATING IMPROVEMENTS

This Contract is made and entered into as of date to be added upon award at Santa Rosa, California, between the City of Santa Rosa (“City") and _____ of _____ ("Contractor").

ARTICLE I - For and in consideration of the payment and agreement hereinafter mentioned, to be made and performed by City, and under the conditions expressed in the required bonds hereunto annexed, Contractor agrees that for the benefit of City, at its own cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the Special Provisions to be furnished by City, necessary to construct and complete the work herein described in a good, workmanlike, and substantial manner. The work embraced herein shall be done in accordance with the Standard Specifications of the State of California Department of Transportation, dated 2010, insofar as the same may apply (Standard Specifications); in accordance with the City of Santa Rosa Construction Specifications for Public Improvements (City Specifications); in accordance with the City of Santa Rosa Design and Construction Standards, (City Standards); in accordance with the State of California Department of Transportation Standard Plans, dated 2010 (Standard Plans), (collectively, “Contract Documents”) and in accordance with the Special Provisions hereinabove set forth, all of which are hereby incorporated into and made part of this Contract.

The work to be performed is further shown upon The Attached Six (6) Exhibits, approved by the Deputy Director of Transportation and Public Works, hereinafter referred to as the Project Plan(s).

ARTICLE II - Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and doing all the work contemplated and embraced in this Contract; also for all loss or damages arising out of the nature of the work aforesaid, or from the acts of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by City and for all expenses incurred by or in consequence of the suspension or discontinuance of work, and for well and faithfully completing the work, and the whole thereof in the manner and according to the Project Plans and Invitation for Bids therefor, and the requirements of the Engineer under them to wit:

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
			$ _____	$ _____

TOTAL BASE BID (SUM OF "TOTAL" COLUMN) $ _____

BID ITEMS IN THIS SECTION WILL BE INSERTED UPON AWARD OF THE CONTRACT AND SHALL BE THE SAME AS THOSE BID UPON.

ARTICLE III - City and Contractor hereby promise and agree that Contractor shall provide the materials and do the work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and City hereby agrees to pay for the same at the time, in the manner, and upon the conditions set forth; and the parties for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to full performance of the covenants herein stated.

ARTICLE IV - By execution of this Contract, Contractor hereby represents and certifies that Contractor is aware of the provisions of Labor Code section 3700 which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor hereby agrees to comply with such provisions before commencing the performance of the work of this Contract.

ARTICLE V - It is further expressly agreed by and between the parties hereto that the Invitation for Bids, containing the Notice to Bidders including any required Bonds, the Contract Documents, and any Addenda are all essential parts of this Contract and are specially referred to and by such reference made a part hereof. In the event of any conflict in the provisions thereof, the terms of said documents shall control each over the other, in the following order:

1. Special Provisions
2. Project Plans
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

ARTICLE VI - Contractor agrees to commence work pursuant to this Contract within ten calendar days from the date authorized in the Notice to Proceed and to diligently prosecute the same to completion in accordance with Section 8-1.04C of the Special Provisions.

This Contract shall not be transferred or assigned without the prior written consent of City, which may be withheld by City in its sole and absolute discretion.

If Contractor is a corporation, two corporate officers of Contractor, one from each of the following two groups shall execute this Contract: a) the chairman of the board, president or any vice-president; b) the secretary, any assistant secretary, chief financial officer, or any assistant treasurer. The name and title of the corporate officers shall be printed under the signature.

In witness whereof, the parties hereto have executed this Contract as of the date first written above.

City:	**Contractor:**
City of Santa Rosa, a Municipal corporation	Name of Contractor, Type of entity
By: _____	By: _____
Title: _____	Name: _____
ATTEST: By: _____	Title: _____
Title: _____	By: _____
Approved as to form:	Name: _____
By: _____ Office of City Attorney	Title: _____