



Contract Documents for the Construction of

# Sacramento Regional Wastewater Treatment Plant

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## RFB# 8224 MIXED SLUDGE TANK #1 STEEL SHELL REPLACEMENT PROJECT

### BID SET

VOLUME 1 OF 2

PART A - SPECIFICATIONS  
PART B - DRAWINGS

MARCH 2017

**REQUEST FOR BID**

**This Is Not An Order - Make A Copy For Your File - Return Original**

<b>C O N T R A C T O R</b>	<b>SACRAMENTO REGIONAL COUNTY                  SANITATION DISTRICT                  PURCHASING AND MATERIALS SUPPORT                  8521 LAGUNA STATION ROAD                  ELK GROVE, CA 95758-9550</b>	Issue Date	March 16, 2017
			Bid Number
		Return your Bid in envelope, sealed and clearly marked on outside with Bid number and date shown below to:  <b>PURCHASING AND MATERIALS SUPPORT                  8521 LAGUNA STATION ROAD                  ELK GROVE, CA 95758-9550                  ATTN: RFB No. 8224</b>  <b>Bids must be received at SRCSD Reception and logged in prior to the date and time indicated. Bids will not be accepted after 3:00 P.M. on:</b>  <b>April 12, 2017</b>	
		For Additional Information Contact	
		Issuing Officer:	<b>Tamblynn Stewart</b>
		PHONE:	<b>(916) 875-9014</b>
		Merchandise or Service for Delivery To: Sacramento Regional County Sanitation District (SRCSD) 8521 Laguna Station Road Elk Grove, CA 95758	

**FAILURE TO SIGN THIS SECTION MAY DISQUALIFY YOUR RESPONSE**

The undersigned offers and agrees to furnish the articles and/or services listed in this document at the prices and terms stated, subject to all of this Request for Bid:

Firm Name	Terms of Sale: <b>Net 30</b>
Signature	F.O.B. Point <b>Destination</b>
Printed Name	CSLB No.:
Federal Tax ID Number	DIR Registration No.:
Date	E-Mail:
Telephone:	Fax:

**MS Tank No. 1 – Steel Shell Replacement Project**

## **RFB #8224 MS Tank No. 1 – Steel Shell Replacement Project**

### **NOTICE TO CONTRACTORS**

NOTICE IS HEREBY GIVEN THAT the Sacramento Regional County Sanitation District (Regional San) invites sealed bids to provide all labor and equipment necessary for the MS Tank No.1 - Steel Shell Replacement Project, located at 8521 Laguna Station Rd. Elk Grove, CA 95758.

**ENGINEER’S ESTIMATE: \$ 186,000.00**

Bids will be received at Regional San’s Office, 8521 Laguna Station Rd, Elk Grove, CA 95758 until 3:00p.m., April 12, 2017 to be publicly opened and declared aloud by District representatives.

- 1) Any bidder who wishes its bid to be considered is responsible for making certain that its bid is actually delivered to Regional San Office. Bids shall be addressed to the Sacramento Regional County Sanitation District, 8521 Laguna Station Rd, Elk Grove, CA 95758, ATTN: RFB #8224.
- 2) Bidder envelope must clearly list contractor name and return address. Envelopes that do not list contractor name and address will not be opened.

#### **Department of Industrial Relations (DIR) Compliance**

- A. No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5
- B. No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
- C. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

Bidder shall be properly licensed in accordance with the Contractors’ Licenses Law; Business and Professional Code of the State of California.

**A mandatory pre-bid meeting** will be held on **March 29, 2017 at 11:00AM** at the Sacramento Regional Wastewater Treatment Plant (8521 Laguna Station Rd, Elk Grove, CA 95758). The purpose of the meeting is to review and clarify project requirements, conduct site inspection, and to respond to questions from the bidders.

Pre-Bid Meeting attendees must e-mail Aaron Bihlman at [bihlmana@sacsewer.com](mailto:bihlmana@sacsewer.com) with attendee names to RSVP prior to the meeting. This information is required to provide access at the Treatment Plant’s security gate.

Detailed bid request document RFB #8224 can be obtained by contacting Tamblynn Stewart at (916) 875-9014 or [stewartt@sacsewer.com](mailto:stewartt@sacsewer.com).

Bid bond/deposit not less than ten (10) percent of the aggregate total bid is required to be submitted with the sealed bid.

Successful Bidder must furnish a 100 percent Performance Bond and Payment Bond.

Bidders are hereby notified that pursuant to Part 7, Chapter 1, Article 2, Section 1770, et seq., of the Labor Code of the State of California, the successful CONTRACTOR and its subcontractors shall pay their labor forces not less than the

general prevailing rate of wages as determined by the Director of the Department of Industrial Relations, and travel and subsistence pay as such are defined in applicable collective bargaining agreements filed in accordance with

Section 1773.8 of said Labor Code, for work needed and performed on this project. It shall, pursuant to the provisions of Section 1773.2 of said Labor Code, be a requirement of the work for the successful bidding contractor to post and maintain a copy of said wages' determinations at the project site throughout the duration of the work.

Regional San hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, creed, color, national origin, ancestry, sexual orientation, political affiliations of beliefs, sex, age, physical handicap, medical condition, marital status or pregnancy as set forth hereunder.

Regional San reserves the right to reject any or all bids and waive any irregularity in bids received.

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## **Background**

Regional San has a Mixed Sludge (MS) process tank that has holes in its steel top shell. The MS Tank was originally built in the early 1990's. The tank stores mixed sludge at an elevated temperature until the sludge can be taken into a digester. The tank is made up of reinforced concrete over the bottom 2/3, while the top 1/3 is carbon steel. The exterior coatings of MS Tank No. 1 have been tested for lead, and no lead was detected.

## **SCOPE OF WORK**

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RFB #8224 will remove the existing steel shell of MS Tank #1 and fabricate a new shell from 316L stainless steel. There are also some replacements necessary on the associated valves and piping.

The work to be completed in RFB #8224 includes all labor, equipment and materials necessary to complete this project as stated in this RFB and on the drawings and specifications.

The following documents are also incorporated into this contract:

Drawings, Title Sheet thru Drawing #G8  
Specification Section 01 30 00, Submittals  
Specification Section 03 15 20, Anchorage in Concrete and Masonry  
Specification Section 03 60 00, Grouting  
Specification Section 05 10 00, Structural Metal Framing  
Specification Section 06 84 13, Fiberglass Reinforced Plastic Fabrications  
Specification Section 07 21 10, Foamed-In-Place Insulation  
Specification Section 07 92 00, Joint Sealants  
Specification Section 40 05 03, Common Work Results for Piping Systems  
Specification Section 40 05 03, Common Work Results for Piping Systems\_Pipespec  
Specification Section 40 05 07, Hangers and Supports for Process Piping  
Specification Section 40 05 23, Stainless Steel Process Pipe and Tubing  
Sacramento County Standard Construction Specifications (current version) – [www.saccountyspecs.net](http://www.saccountyspecs.net)

Such other items or details not mentioned above that are required by the plans or these specifications shall be performed, placed, constructed, or installed in accordance with the Standard Construction Specifications or Special Provisions.

## KEY ACTION DATES

Bid Issue	March 16, 2017	
RFB Advertisement	March 16 & March 22, 2017	
Pre-Bid Meeting (MANDATORY)	March 29, 2017	11:00 a.m. Sacramento Regional Wastewater Treatment Plant 8521 Laguna Station Road Elk Grove, CA 95758
Questions Due:	April 5, 2017	
DIR Registration Due:	April 11, 2017	Bids from Contractors not registered on the Department of Industrial Relations website by this date will not be opened.
Bid Due Date	April 12, 2017	
Intent to Award	April 18, 2017	
Contract Award	April 25, 2017	
Provide Required Insurance and Bonds	May 5, 2017	
Notice to Proceed	TBD	
Pre-Construction Meeting	TBD	
Construction Completion (on or before)	122 Calendar Days after NTP	

## INTRODUCTION

**INVITATION** – The Sacramento Regional County Sanitation District (Regional San), Purchasing & Material Support, invites Responses which offer to provide the goods and/or services identified on the Cover Sheet, page 1.

**DEFINITIONS** - We intend to express our expectations clearly, and they are to be legally interpreted in our favor. Certain words are used throughout this document:

**We/Us/Our** are terms which refer to the Sacramento Regional County Sanitation District, a duly organized public entity. They may also be used as pronouns for various subsets of Regional San organization, including, as the context will indicate:

*District* – Sacramento Regional County Sanitation District

*Regional San* – Sacramento Regional County Sanitation District

*Sacramento Regional Wastewater Treatment Plant* – (SRWTP)

**You/Your** are terms which refer to businesses having some sort of relationship to or with us. The term may apply differently as the context will indicate. For instance, “you” as a Contractor will have different obligations than “you” as a Bidder or Supplier will have:

*Supplier* - A business entity which may provide the subject goods and/or services

*Bidder* - A business entity submitting a Response to this request for bid. Suppliers which may express interest in this RFB, but which do not submit a Response, have no obligations with respect to the bid requirements.

*Contractor* - The Bidder whose Response to this RFB is found by Purchasing to meet the needs of Regional San. Contractor will be selected for award, and will enter into a contract for provision of the goods and/or services described in the RFB.

**RFB** - This entire document, including attachments.

**Response** - The written, signed and sealed document submitted according to the RFB instructions. Response does not include any verbal or documentary interaction you may have with us apart from submittal of a formal response.

**RFB CLARIFICATION** - Questions regarding this RFB should be directed in writing to the Issuing Officer specified on the Cover Sheet, page 1. Answers, citing the question, but not identifying the questioner, will be distributed simultaneously to all known prospective Bidders.

**RFB Amendment** - If it becomes evident that this RFB must be amended, we will issue a formal written amendment to all known prospective Bidders.

**Bidder Responsibility** - We expect you to be thoroughly familiar with all specifications and requirements of this RFB. Your failure or omission to examine any relevant form, article, site or document will not relieve you from any obligation regarding this RFB. By submitting a Response, you are presumed to concur with all terms, conditions and specifications of this RFB.

**AWARD** – Award will be made to the lowest responsible bidder.

**CONTRACT EXECUTION** - This RFB and the Contractor’s Response will be made part of any resultant Contract and will be incorporated in the Contract as set forth.

**Protests:** After receipt of Regional San's "Intent to Award" notice, any bidder who has questions or concerns should immediately contact the Issuing Officer for discussion. Any bidder who believes that they have grounds for a protest must submit a written protest on company letterhead within three (3) business days after the Intent to Award letter has been sent out. Any protest letter must state the specific grounds for protest and the actions being requested of Regional San. **No protest received after 4 p.m. on the 3rd business day shall be accepted.**

If any District holiday falls within the 3 business day protest response period the protest acceptance period will be extended by the holiday(s). For example, if the Intent to Award notice is issued on a Friday, a protest must be received by Wednesday at 4 p.m. Should any of the 3 days be a County holiday the deadline will be extended by the number of holidays occurring during the 3 business day protest response period.

**Precedence** - In the event of contradictions or conflicts between the provisions of the documents comprising the Contract, they will be resolved by giving precedence in the following order:

- 1) the provisions of the Contract (as it may be amended);
- 2) the provisions of the Bidder's Response (as it may be clarified);
- 3) the provisions of the RFB (as it may be supplemented);
- 4) the provisions of the County Standard Specifications.

**CLAIMS** - Claims for \$375,000 or less shall be in accordance with Section 20104 of the Public Contract Code.

**ISSUING OFFICER** - The issuing officer and mailing address to send Bids, questions, and all other correspondence concerning this RFB is:

Tamblynn Stewart  
Senior Contract Service Officer  
(916) 875-9014  
stewartt@sacsewer.com

**PROJECT CONTACT** –

Aaron Bihlman  
Sacramento Regional Wastewater Treatment Plant (SRWTP)  
Sacramento Regional County Sanitation District (Regional San)  
Telephone: (916) 875-9214  
bihlmana@sacsewer.com



**CONTRACTOR EXAMINATION OF THIS RFB/QUESTIONS** - Contractor shall examine carefully the entire RFB and any addenda thereto, and all related materials and data referenced in the RFB or otherwise available, and shall become fully aware of the system needs through discussion and visits with Regional San.

If contractors discover an ambiguity, conflict, discrepancy, omission or other errors in the RFB, they shall immediately notify the Issuing of such error in writing and request modification of the document. Modifications shall be made by addenda.

Contractors requiring clarification of the intent or content of this RFB or on procedural matters regarding the bid process may request clarification by contacting the Issuing Officer identified above.

**SUBMISSION OF BIDS** - Bids should be prepared in such a way as to provide a straight forward, concise delineation of capabilities to satisfy the requirements of the RFB. Expensive binding, colored displays, promotional materials, etc., are not necessary or desired. Emphasis should be concentrated on conformance and clarity of content. Contractor bids shall be completed in all respects as indicated. A Bid may be rejected if it is conditional or incomplete, or if it contains irregularities of any kind.

Bids which contain false or misleading statements, or which provide references which do not support an attribute or capability of the proposed system may be rejected. If, in the opinion of Regional San, such information was intended to mislead Regional San in its evaluation of the Bid and the attribute, condition or capability as a requirement of the RFB, the bid shall be rejected.

The bid must be signed by an individual who is authorized to bind the proposing firm contractually. The signature should indicate the title or position that the individual holds in the firm. Firms who sign their contracts with the name of the firm must provide the name of the corporate officer for signature validation by Regional San. An unsigned Bid shall be rejected.

**ACCEPTANCE AND REJECTION OF BIDS** - Regional San reserves the right:

- To reject any or all Bids, or any part thereof;
- To waive any informality in the Bid;
- To accept the Bid that is in the best interest of Regional San.

**Regional San's decision shall be final.**

## **Holidays**

The following holidays are observed by Regional San. Contractors will not normally be scheduled to work on the days that are chosen by the County to observe these holidays. Contract employees will not be paid for holidays upon which they do not work. The actual County holiday calendar is available the December before the beginning of the new calendar year.

### Holiday List:

- New Year's Day
- Martin Luther King Day
- Abraham Lincoln's Birthday
- George Washington's Birthday
- Cesar E. Chavez Day (pending union agreement)
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day

- Veterans' Day
- Thanksgiving & Day After
- Christmas Day

## **BID INQUIRES -**

Questions regarding this bid should be referred to:

Attn: Tamblynn Stewart  
Senior Contract Services Officer  
(916) 875-9014  
[stewartt@sacsewer.com](mailto:stewartt@sacsewer.com)

Questions regarding drawings and specifications shall be referred to:

Aaron Bihlman, P.E.  
Associate Civil Engineer  
(916) 875-9214  
[bihlmana@sacsewer.com](mailto:bihlmana@sacsewer.com)

These inquiries are to be submitted by **April 5, 2017**. Any interpretations by Regional San will be made in the form of a written amendment. The receipt of such an amendment must be acknowledged in accordance with the directions on the amendment. Oral explanations or instructions given before the award of the contract will not be binding.

**Bidder Response:** Interested bidders must complete and return the following pages/sections by the closing date and time shown on the cover page in order to be considered.

- Cover Page with authorized signature
- Cost Response
- Regarding Insurance Coverage
- Bid Guaranty Bond
- Instructions for Bid Security
- Instruction for Performance Bond
- Instruction for Payment Bond
- Subcontractors
- Contractor's License Certification
- Exception Response Page
- Contractor Experience
- Non-Collusion Declaration
- Two (2) copies of proposal and mark the original as the "Original" or "Master Copy"

**Note:** Regional San will not accept bids by way of facsimile transmission or e-mail. Bids must be signed and received in a sealed envelope by 3:00PM on April 12, 2017. Refer to instructions on the cover page.

## **PRIMARY SPECIFICATIONS**

### **2.1 PRE-BID MEETING**

A Pre-Bid meeting will be held on **March 29, 2017, at 11:00AM** at the Sacramento Regional Wastewater Treatment Plant. The purpose of the meeting is to review and clarify project requirements, conduct site inspection, and to respond to questions from the bidders. **Attendance is MANDATORY.** Contact Aaron Bihlman at (916) 875-9214 if there are any questions.

### **2.2 ADDENDA**

The correction of any discrepancies in, or omission from, the drawings, specifications, or other contract documents, or any interpretation thereof, during the bidding period will be made only by an addendum issued by Regional San. A copy of each such addendum issued by Regional San will be e-mail, mail or delivered to each person receiving a set of these documents, and shall be made a part of the contract. Any other interpretation or explanation of such documents will not be considered binding.

Each bidder shall be responsible that all firms or persons submitting proposals to them, i.e., prospective subcontractors, manufacturers, suppliers, etc. are informed of any such addendum.

### **2.3 START OF WORK & TIME OF COMPLETION**

The work shall commence no later than 15 days of receipt of Notice to Proceed. Failure to pursue the work may result in the termination of Contract by Regional San.

The time for completion of this contract shall be 122 calendar days (excluding Holidays) after NTP, unless Regional San approves a time extension. The work shall be scheduled for the earliest completion possible and the shortest on-site construction time possible.

### **2.4 LIQUIDATED DAMAGES**

Liquidated damages shall be \$400 for each calendar day delay beyond time of completion.

### **2.5 PRE CONSTRUCTION MEETING**

Prior to start of construction, a meeting shall be announced which will be attended by the Contractor to review the construction program. At this conference, the construction schedule, safety, labor and other requirements shall be agreed upon by Regional San and the Contractor.

### **2.6 PROGRESS SCHEDULE**

The contractor shall submit to Regional San a proposed schedule at the pre-construction meeting.

Neither the submission nor the updating of the Contractor's original schedule submittal, revised schedule or narrative submitted to the Engineer by the Contractor under this Contract, nor the Engineer's review or acceptance of any such report, schedule, or narrative shall have the effect of amending or modifying, in any way, the Contract completion date or of modifying or limiting, in any way, the Contractor's obligations under this Contract. Only a signed, fully executed Change Order can modify the Contract.

### **2.7 PERMITS**

Access to the Plant site shall be as directed by Regional San. An Access Request Form (AR) shall be required to be submitted by the Contractor for approval at least **10 working days** in advance of work. AR forms shall be provided at the pre-construction meeting.

### **2.8 SUBMITTALS**

Prior to the commencement of any construction activities, the contractor shall have submitted the required submittals. Submittal requirements are included in the individual specifications and as mentioned in drawings.

Submittals included, but are not limited to product data, samples, test procedures, test results, requests for substitutions, descriptive data, certificates, methods, schedules, marked contract drawings and specifications, manufacturer's installation and other instructions, and miscellaneous work items. Submittals also include all other information as may reasonably be required. Submittals shall be submitted to Regional San at least **7 days** before the date needed. Review of submittal information shall not waive or change any requirements of the contract documents.

## 2.9 **SAFETY**

Regional San shall make every possible effort to accommodate the needs of the Contractor, consistent with safety and operational requirements, in the interest of prompt completion of the work. Contractor shall comply with the requirements of the current Plant safety Manual, CAL OSHA and Title 8 of the California Code of Regulations. In certain areas, the plant safety requirements exceed California OSHA safety requirements and those safety requirements will be provided prior to the start of the work. As part of OSHA's National Emphasis Program (NEP), any contractor or subcontractor working on or adjacent to chlorine, sulfur dioxide, and/or digester gas systems during a PSM inspection will also be inspected by OSHA per CPL 02-09-06.

## 2.10 **STAGING AREA AND PARKING**

Contractor shall assume all responsibility for storage of tools, materials, and equipment on the job site. Regional San will designate an area as the Contractor's staging area. Only the area designated by Regional San can be used for storage.

Contractor shall assume all responsibility for vehicular parking of his or his subcontractor's and employee's vehicles to assure that they shall not park in prohibited areas and shall not obstruct normal traffic.

## 2.11 **TEMPORARY UTILITIES AND FACILITIES**

Certain existing Plant utilities will be available for use by the Contractor, subject to specified conditions. An Access Request detailing the proposed usage shall be submitted and approved prior to connection or usage.

Non-potable water will be available at existing Plant utility stations. The water is not suitable for human consumption.

Contractor shall furnish and maintain temporary office, shop, storage, and sanitation facilities.

All temporary utilities and facilities shall be removed and the area restored before acceptance of the Work.

## 2.12 **ADDITIONAL REPAIR WORK**

The Bid Items provide a method of payment through an allowance for additional repair work, if any, discovered during progress of the contract work. Regional San will designate the location and type of repairs that will be required.

The total amount to be paid to the Contractor shall be the portion of the allowance actually utilized in the course of completing the work, as determined by Regional San and agreed upon by the Contractor.

## 2.13 **CONTRACT CHANGES**

District may increase, decrease, alter or change the Work. An equitable adjustment will be made to the Contract Amount and Contract Time.

Contractor shall provide a written response to each proposed change within 7 days. The response shall indicate the cost, time and impact of the change.

Changes will be made by Change Order or Field Instruction issued by District. A Field Instruction will direct Contractor to proceed with a change or extra work.

The Contract Amount will be adjusted by one of the following methods:

- Lump Sum
- Unit Prices from the Bidding Schedule
- Force Account

Force Account payment shall only include the direct costs for labor, material, equipment and incidental items. The cost for labor shall include wages, payroll taxes, benefits, and worker compensation insurance. The cost for material shall include sales tax and delivery costs. The cost for equipment shall include operation and maintenance expenses.

A 20 percent markup of the direct costs will be allowed for indirect expenses, overhead, insurance, bond and profit for Force Account work performed by Contractor. A 5 percent markup will be allowed for Force Account work performed by subcontractors.

A cost tabulation and receipts shall be submitted with each Force Account payment request.

**2.14 GUARANTEE**

The Contractor agrees to abide by the conditions of the attached guarantee which shall be signed and delivered to Regional San before the final payment is made.

**2.15 SCHEDULE OF WORK AND LIMITATION**

During the progress of work, the existing facilities shall be maintained without interruption, except by specific arrangement with Regional San and then only at such times as approved in writing by Regional San.

**2.16 AS-BUILT DOCUMENTS (DELETED)**

**2.17 CONTRACTOR'S CALIFORNIA LICENSE AND/OR CLASS REQUIRED**

A - General Engineering Contractor

**2.18 CLEANUP AND PROTECTION OF WORK**

The Contractor shall keep the site clean at all times of rubbish or debris and shall remove from the premises any such accumulation immediately upon notification by Regional San. In the event the Contractor does not remove promptly the debris from the premises after notification by Regional San, Regional San shall have the right to cause its removal and to deduct such charges from the monies owed to the Contractor.

**2.19 EXISTING UTILITIES**

It is recognized by Regional San and the Contractor that the location of existing utility facilities as shown on contract drawings and specifications are approximate; their exact location is unknown.

Recognition is given to the fact there may be additional utilities existing on the property unknown to either party to the contract. Location of utilities as shown on the plans and specifications represent the best information obtainable from utility maps and other information furnished by the various agencies involved. Regional San warrants neither the accuracy nor the extent of actual installations as shown on the drawings and specifications.

The Contractor agrees and is required to coordinate and fully cooperate with Regional San and utility owners for the location, relocation, and protection of utilities. The Contractor shall submit an Access Request prior to excavating on the site.

In accordance with Section 4215 of the Government Code of the State of California, Regional San shall make provisions to compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such main and trunk line utility facilities

not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. Compensation will be in accordance with reference to the comparable section in Sacramento County Standard Construction Specifications (Standard Specifications).

In the event the Contractor discovers utilities not identified in the plans or specifications, the Contractor shall immediately notify the Engineer by the most expeditious means available and later confirm in writing.

Unless otherwise indicated on the drawings or in the specifications, the Contractor shall maintain in service all drainage, water, gas, and sewer lines, including house services, power, lighting, and telephone conduits, and any other surface or subsurface structure of any nature that may be affected by the Work.

Unless otherwise indicated in the specifications, the Contractor shall be responsible for protecting all existing utilities.

## 2.20 **DISCREPANCIES IN SPECIFICATIONS AND PLANS**

The specifications and drawings are intended to be explanatory of each other. Any work shown in the contract drawings and not in the specifications, or vice versa, is to be executed as if indicated in both. In case of conflict, this Contract, including Special Provisions and Technical Specifications, shall govern over all, Division 14 through 17 shall govern over the contract drawings. The contract drawings shall govern over the Standard Specifications.

## COST RESPONSE

<b>WORK ITEM – MS Tank No. 1 - Steel Shell Replacement Project</b>					
<b>Bid Items</b>					
<b>Item No</b>	<b>Description</b>	<b>Size Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Total Amount</b>
1	All work associated with this contract.	1	EA		
		--	--		
<b>TOTAL BID AMOUNT:</b> (sum of all contract services including bid items listed above)				\$	
<b>Total Bid in Words:</b>					

## **GENERAL TERMS AND CONDITIONS**

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### **3.1 COMPLIANCE WITH STANDARD TERMS & CONDITIONS**

You agree to be bound by our standard “boilerplate” conditions, a sample of which is attached to page 24-25 of this RFB.

### **3.2 INSURANCE**

The insurance provisions attached on pages 18-21 must be complied with by you if awarded the order. Proof of insurance must be provided to us prior to commencement of work under the contract.

### **3.3 PREVAILING WAGES**

Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor code of the State of California, not less than the general prevailing rate of per diem wages, and not less than the general prevailing of per diem for holidays and overtime work, for each craft, classification or type of workman needed to execute the work contemplated under this Agreement shall be paid to all workers, laborers and mechanics employed in the execution of said work. The appropriate determination of the Director of the California Department of Industrial Relations is filed with, and available for inspection at the office of, the clerk of the Governing Board.

Contractor shall post, at each job site, a copy of such prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations.

### **3.4 CONTRACTOR LICENSE**

Pursuant to the Business and Professions Code of the State of California, Section 7030. Contractor License Certification attached.

Contractors are required by law to be licensed and regulated by the Contractor’s State License Board, 3132 Bradshaw Road, Sacramento, CA, Mailing Address: P.O. Box 26000, Sacramento, CA 95826.

### **3.5 SUBCONTRACTORS**

Each bid shall have listed on the form provided herewith the name and address of each subcontractor to whom the bidder proposes to sublet portions of the work in excess of one-half of one percent of the total amount of the bid. For the purpose of this paragraph, a subcontractor is defined as one who contracts with the Contractor to furnish materials and labor, or only for the performance of work at the site of the work or who will specially fabricate a portion of the work off the site pursuant to detailed drawings in the contract documents.

### **3.6 PROPOSAL GUARANTY**

The proposal shall be accompanied by a proposal guaranty bond duly completed by a guaranty company authorized to carry on business in the State of California for payments to the Owner in the sum of at least 10% of the total amount of the proposal, or alternatively by a certified or cashier check made payable to the Owner in the sum of a least 10% of the total amount of the proposal. The amount payable to the Owner under the proposal guaranty bond, or the certified or cashier’s check and the amount thereof, as the case may be, shall be forfeited to the Owner in case of a failure or neglect of the bidder to furnish, execute and deliver to the Owner the required performance bond, including payment bond, evidences of insurance and to enter into, execute and deliver to the Owner the agreement on the form provided herewith, within ten (10) days after being notified in writing by the Owner that the award has been made and the agreement is ready for execution

### **3.7 RETENTION**

Regional San will retain 10% (Ten-percent) of the estimated project cost. These monies shall be retained for 30 days or when project manager signs the project completed.



### 3.8 **INDEMNIFICATION**

To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless Regional San, Sacramento Area Sewer District and the County, its governing Boards, officers, directors, officials, employees, and authorized volunteers and agents, (collectively "Indemnified Parties") from and against any and all claims, demands, actions, losses, liabilities, damages, and all expenses and costs incidental thereto (collectively "Claims") including cost of defense, settlement, arbitration, and reasonable attorneys' fees, resulting from injuries to or death of persons, including but not limited to employees of either Party hereto, and damage to or destruction of property or loss of use thereof, including but not limited to the property of either Party hereto, arising out of, pertaining to, or resulting from the acts or omissions of the Contractor, its officers, employees, or agents, or the acts or omissions of anyone else directly or indirectly acting on behalf of the Contractor, or for which the Contractor is legally liable under law regardless of whether caused in part by an Indemnified Party. Contractor shall not be liable for any Claims to the extent caused by the active negligence of an Indemnified Party where such indemnification would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

This indemnity shall not be limited by the types and amounts of insurance or self-insurance maintained by the Contractor or the Contractor's Subcontractors.

Nothing in this Indemnity shall be construed to create any duty to, any standard of care with reference to, or any liability or obligation, contractual or otherwise, to any third party.

The provisions of this Indemnity shall survive the expiration or termination of the Agreement.

### 3.9 **TERMINATION OF CONTRACT**

Whenever, in the opinion of the Board, the Contractor has failed to supply an adequate force of labor, equipment, or materials of proper quality, or has failed in any other respect to prosecute the work with diligence or should there be persistent or repeated refusal or failure to comply with laws, ordinances, or directions of the Engineer; or should there be consistent failure to make prompt payments to subcontractors, for labor or materials, the Board may give written notice of at least 5 calendar days to the Contractor and sureties that if the defaults are not remedied within a time specified in such notice, the Contractor's control over the work will be terminated.

If the Contractor should be adjudged bankrupt, or make an assignment for the benefit of creditors, or if a receiver should be appointed on account of insolvency, the Board may declare the Contractor's control over the work terminated, and so notify the Contractor and sureties.

Upon such termination, the Board may direct the Engineer to take possession of and use all or any part of the Contractor's materials, tools, equipment and appliances upon the premises to complete the work; Regional San assuming responsibility for the final relinquishment of such equipment at the conclusion of the work, or sooner, at its option, in as good condition as when it was taken over, reasonable wear and tear excepted, and Regional San agrees to pay for such materials and the use of said equipment a reasonable compensation to be mutually agreeable to the Board and the Contractor.

The Engineer may permit the surety to complete or cause the Work to be completed, or the Engineer may direct that all or any part of the work be completed by day labor, or by employment of other contractors. Such informal contracts may be awarded after a bid form has been prepared and a copy served upon the Contractor whose control has been terminated and upon the surety, and not less than 3 calendar days allowed thereafter, so that others may bid.

If the work is completed as provided above, the Contractor is not entitled to receive any portion of the amount to be paid under the Contract until it is fully completed. After completion, if the unpaid balance exceeds the sum of the amount expended by Regional San in finishing the work, plus all damages sustained or to be sustained by Regional San, plus any unpaid claims on account of labor, materials, tools, equipment, or supplies contracted for by the Contractor for the work herein contemplated, provided that sworn statements of said claims shall have been filed with the Board, the excess not otherwise required by these specifications to be

retained shall be paid the Contractor. If the sum so expended exceeds the unpaid balance, the Contractor and surety are liable to Regional San for the amount of such excess. If the surety completes the Work, such surety shall be subrogated to money due under the Contract and to money which shall become due in the course of completion of the surety.

Regional San may, without prejudice to any other remedy it may have under the provisions of the Contract, terminate this Contract, in whole or in part, at any time by giving written notice to Contractor or its representative by certified mail, return receipt requested. Termination shall be effective upon receipt of notice by Contractor. Contractor shall immediately discontinue work and take all reasonable steps with its suppliers and subcontractors to minimize cancellation charges and other costs.

In the event of termination for reasons other than default of Contractor, Contractor shall be entitled to recover all reasonable costs incurred in connection with performance of the Work, plus any cost and expense reasonably and necessarily incurred in connection with such termination, plus a percentage of the profit based on the percentage of completion of the Work.

If the work is stopped by order of a court, a public authority or Regional San for a period of 90 calendar days or more through no act or fault of the Contractor, then the Contractor may terminate the Contract 10 calendar days after written notice to Regional San. Upon receipt of the written notice, Regional San shall terminate the contract.

## **DISTRICT INSURANCE REQUIREMENTS FOR CONTRACTORS**

Without limiting CONTRACTOR'S indemnification, CONTRACTOR shall procure and maintain for the duration of the Agreement, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Agreement by CONTRACTOR, its agents, representatives or employees. DISTRICT shall retain the right at any time to review the coverage, form, and amount of the insurance required hereby. If in the opinion of DISTRICT Risk Manager, insurance provisions in these requirements do not provide adequate protection for DISTRICT and for members of the public, DISTRICT may require CONTRACTOR to obtain insurance sufficient in coverage, form and amount to provide adequate protection. DISTRICT'S requirements shall be reasonable but shall be imposed to assure protection from and against the kind and extent of risks that exist at the time a change in insurance is required.

### **Verification of Coverage**

CONTRACTOR shall furnish DISTRICT with certificates evidencing coverage required below. **Copies of required endorsements must be attached to provided certificates.** DISTRICT Risk Manager may approve self-insurance programs in lieu of required policies of insurance if, in the opinion of the Risk Manager, the interests of DISTRICT and the general public are adequately protected. All certificates, evidences of self-insurance, and additional insured endorsements are to be received and approved by DISTRICT before performance commences. DISTRICT reserves the right to require that CONTRACTOR provide complete, certified copies of any policy of insurance including endorsements offered in compliance with these specifications.

### **Minimum Scope of Insurance**

Coverage shall be at least as broad as:

**GENERAL LIABILITY:** Insurance Services Office's Commercial General Liability occurrence coverage form CG 0001. Including, but not limited to Premises/Operations, Products/Completed Operations, Contractual, and Personal & Advertising Injury, without additional exclusions or limitations, unless approved by DISTRICT Risk Manager.

**AUTOMOBILE LIABILITY:** Insurance Services Office's Commercial Automobile Liability coverage form CA 00 01. Commercial Automobile Liability: auto coverage symbol "1" (any auto) for corporate/business owned vehicles. If there are no owned or leased vehicles, symbols 8 and 9 for non-owned and hired autos shall apply. Personal Lines automobile insurance shall apply if vehicles are individually owned.

**WORKERS' COMPENSATION:** Statutory requirements of the State of California and Employer's Liability Insurance.

**PROFESSIONAL LIABILITY** or Errors and Omissions Liability insurance appropriate to CONTRACTOR'S profession.

**UMBRELLA** or Excess Liability policies are acceptable where the need for higher liability limits is noted in the Minimum Limits of Insurance and shall provide liability coverages that at least follow form over the underlying insurance requirements where necessary for Commercial General Liability, Commercial Automobile Liability, Employers' Liability, and any other liability coverage (other than Professional Liability) designated under the Minimum Scope of Insurance.

**CONTRACTORS POLLUTION LIABILITY (CPL):** Contractor shall procure, maintain, and keep in force at all times during the term of the Contract, at the Contractor's sole expense, Contractor's Pollution Liability (CPL) insurance which provides coverage for liability arising from the sudden and accidental release of pollution on the project site or transportation of pollutants from or to the project site. The minimum limits shall be not less than \$1,000,000 per claim or pollution incident and \$1,000,000 aggregate.

**Minimum Limits of Insurance**

CONTRACTOR shall maintain limits no less than:

General Liability shall be on an Occurrence basis (as opposed to Claims Made basis). Minimum limits and structure shall be:

General Aggregate:	\$2,000,000
Products Comp/Op Aggregate:	\$2,000,000
Personal & Adv. Injury	\$1,000,000
Each Occurrence:	\$2,000,000

Building Trades Contractors and Contractors engaged in other projects of construction shall have their general liability Aggregate Limit of Insurance endorsed to apply separately to each job site or project, as provided for by Insurance Services Office form CG-2503 Amendment-Aggregate Limits of Insurance (Per Project).

Automobile Liability: \$1,000,000 Combined Single Limit per accident for bodily injury and property damage. If Contractor will utilize any heavy, extra-heavy, or tractor trailer vehicles in performance of the work or services, then a minimum Two Million Dollars (\$2,000,000) each accident shall be required regardless of the number or mix of vehicles

Workers' Compensation: Statutory.

Employer's Liability: \$1,000,000 per accident for bodily injury or disease.

UMBRELLA or Excess Liability policies are acceptable where the need for higher liability limits is noted in the Minimum Limits of Insurance and shall provide liability coverages that at least follow form over the underlying insurance requirements where necessary for Commercial General Liability, Commercial Automobile Liability, Employers' Liability, and any other liability coverage designated under the Minimum Scope of Insurance.

CONTRACTORS POLLUTION LIABILITY (CPL): \$1,000,000 per claim or pollution incident and \$1,000,000 aggregate.

**Deductibles and Self-Insured Retention**

Any deductibles or self-insured retention must be declared to and approved by Regional San. At the option of Regional San, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as respects Regional San, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

**Other Insurance Provisions**

The insurance policies required in this Agreement are to contain, or be endorsed to contain, as applicable, the following provisions:

**ADDITIONAL INSURED STATUS:** Regional San, Sacramento Area Sewer District, and the County of Sacramento, their respective governing boards, officers, directors, officials, employees, and authorized agents and volunteers are to be endorsed as additional insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no endorsed limitations on the scope of protection afforded to Regional San, respective governing boards, officers, directors, officials, employees, and authorized agents and volunteers. Applicable to General Liability, and Auto Liability Policies. The additional insured

endorsement to the General Liability policy shall be provided by issuance of both ISO Form CG 2010 1001 and ISO Form CG 2037 1001 additional insured endorsements, or such other endorsement as acceptable to Risk Management Department.

**PRIMARY INSURANCE:** For any claims related to this agreement, the Contractor's insurance coverage shall be endorsed to be primary insurance as respects Regional San, Sacramento Area Sewer District, and the County, their respective governing boards, officers, directors, officials, employees and authorized agents and volunteers. Any insurance or self-insurance maintained by Regional San, Sacramento Area Sewer District or the County, their respective governing boards, officers, directors, officials, employees, and authorized agents and volunteers shall be excess of the Contractor's insurance and shall not contribute with it. Applicable to General Liability and Auto Liability policies.

**FAILURE TO COMPLY:** Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to Regional San, its officers, directors, officials, employees, agents or volunteers. Applies to policies in which Regional San is named as an additional insured.

**SEVERABILITY OF INTEREST:** The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability. Applicable to General Liability and Auto Liability policies.

**MAINTENANCE OF INSURANCE COVERAGE:** The Contractor shall maintain all insurance coverages in place at all times and provide Regional San with evidence of each policy's renewal ten (10) days in advance of its anniversary date. Contractor is required by this Agreement to immediately notify County if they receive a communication from their insurance carrier or agent that any required insurance is to be canceled, non-renewed, reduced in scope or limits or otherwise materially changed. Contractor shall provide evidence that such cancelled or non-renewed or otherwise materially changed insurance has been replaced or its cancellation notice withdrawn without any interruption in coverage scope or limits. Failure to maintain required insurance in force shall be considered a material breach of the Agreement. Applicable to all policies.

**WORKERS' COMPENSATION WAIVER OF SUBROGATION:** The workers' compensation policy required hereunder shall be endorsed to state that the workers' compensation carrier waives its right of subrogation against Regional San, Sacramento Area Sewer District, and the County, their respective governing boards, officers, directors, officials, employees and authorized agents and volunteers, which might arise by reason of payment under such policy in connection with performance under this Agreement by the Contractor.

**CIVIL CODE PROVISION:** Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

**ACCEPTABILITY OF INSURERS:** Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-VII. The County Risk Manager may waive or alter this requirement, or accept self-insurance in lieu of any required policy of insurance if, in the opinion of the Risk Manager, the interests of Regional San and the general public are adequately protected.

**SUBCONTRACTORS:** Contractor shall require all subcontractors to maintain adequate insurance. Subcontractors shall name CONTRACTOR as additional insured on their General Liability policies. CONTRACTOR shall maintain copies of certificates of insurance and additional insured endorsements as provided by contractor's subcontractor. All coverage's for subcontractors shall be subject to all of the requirements stated herein.

**NOTIFICATION OF CLAIM:** If any claim for damages is filed with Contractor or if any lawsuit is instituted against Contractor, that arise out of or are in any way connected with Contractor's performance under this Agreement and that in any way, directly or indirectly, contingently or otherwise, affect or might reasonably affect County, Contractor shall give prompt and timely notice thereof to County. Notice shall not be considered prompt and timely if not given within thirty (30) days following the date of receipt of a claim or ten (10) days following the date of service of process of a lawsuit.

**REGARDING INSURANCE COVERAGE**  
**To Be Submitted with Bid**

Bidder HEREBY CERTIFIES that the Bidder has reviewed and understands the insurance coverage requirements specified in the Request for Bid No. 8224 MS Tank No. 1 Steel Shell Replacement Project. Should the Bidder be awarded a contract for the work, bidder further certifies that the bidder can meet the specified requirements for insurance, including insurance coverage of the subcontractors, and agrees to name the Sacramento Regional County Sanitation District as Additional Insured for the work specified.

\_\_\_\_\_  
Name of Proposer (Person, Firm, or Corporation)

\_\_\_\_\_  
Signature of Proposer's Authorized Representative

\_\_\_\_\_  
Name & Title of Authorized Representative

\_\_\_\_\_  
Date of Signing

## **PREVAILING WAGE**

**PREVAILING WAGE** - Pursuant to Section 1770, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are on file at the office of the Clerk of the Board of Supervisors, Suite 2450, 700 "H" Street, Sacramento, California 95814. Copies shall be made available to any interested party on request.

The wage rates determined by the Director of the California Department of Industrial relations refer to expiration dates. Prevailing wage determinations with a single asterisk (\*) after the expiration date which are in effect on the date of advertisement for bids remain in effect for the duration of the project. Prevailing wage determinations with double asterisks (\*\*) after the expiration date indicate that the basic hourly wage rate, overtime and holiday pay rates, and employer payments to be paid for work performed after this date have been determined. If work is to extend past this date, the new rate must be paid and should be incorporated in contracts entered into. The Contractor should contact the prevailing wage unit, DLSR, (415) 703-4281 or the Sacramento County Labor Compliance Section, (916) 875-2700, to obtain predetermined wage changes. All determinations that do not have double asterisks (\*\*) after the expiration date remain in effect for the duration of the project.

The Contractor shall forfeit, as penalty to Regional San, not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing rates for any work done under the contract by him/her or by any subcontractor under the contractor, in violation of the provisions of such Labor Code. The provisions of section 1775 of said labor code shall be complied with.

Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor code of the State of California, not less than the general prevailing rate of per diem wages, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work contemplated under this Agreement shall be paid to all workers, laborers, and mechanics employed in the execution of said work by Contractor, or by any subcontractor doing or contracting to do any part of said work. The appropriate determination of the Director of the California Department of Industrial Relations is filed with, and available for inspection at the office of, the Clerk of the Governing Board.

Contractor shall post, at each jobsite, a copy of such prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations.



**SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT**  
**STANDARD TERMS AND CONDITIONS BIDS / PROPOSALS / QUOTES**

**1. PREPARATION OF RESPONSE:**

- a. All information requested of the bidder must be entered in the appropriate spaces on the form. Failure to do so may disqualify your offer.
- b. All information must be entered in ink or typewritten. Mistakes may be crossed out and corrections inserted before submission of your response. Corrections must be initiated in ink by the person signing the response.
- c. Corrections and/or modifications received after the specified closing time will not be accepted.
- d. Time of delivery must be stated as the number of calendar days following receipt of the order by the contractor to receipt of the goods or services by Regional San.
- e. Time of delivery may be a consideration in the award.
- f. Prices will be considered as net if no cash discount is shown.
- g. All responses must be signed by an authorized officer or employee of the responder.
- h. Responses must be submitted prior to the specified date and time. Late responses, telegraphic, fax, or telephone responses will not be accepted.
- i. Submit responses in a sealed envelope with the RFQ/RFB/RFB number, closing date, and time shown.
- j. If any information contained in the response is considered confidential or proprietary by bidder, it must be clearly labeled as such and presented in a sealed envelope within the bidder's response package.
- k. Unless otherwise definitely specified, the unit prices do not include California sales and use tax or Sacramento County sales and use tax.

**2. BRAND NAMES:**

- a. Brand names and numbers, when used, are for reference to indicate the character or quality desired. Equal items will be considered, provided your offer clearly describes the article. Offers for equal items must state the brand and number, or level of quality. The determination of Regional San Purchasing Officer as to what items are equal is final and conclusive.
- b. When brand, number, or level of quality is not stated by bidder, the offer will be considered exactly as specified.

**3. SAMPLES:** Samples of articles, when required, must be furnished free of cost. Samples may be retained for future comparison. Samples which are not destroyed by testing or which are not retained for future comparison will be returned upon request at your expense.

**4. AMERICANS WITH DISABILITIES ACT:** As a condition of submitting a response to the Sacramento Regional County Sanitation District (SRCSD), the bidder certifies that its business entity is in compliance with the "Americans With Disabilities Act" of 1990, as amended. Failure to certify prohibits the award of a Contract to the bidder.

**5. LIABILITIES:** The bidder shall hold the SRCSD, its officers, agents, servants, and employees, harmless from liability of any nature or kind because of use of any copyrighted, or uncopyrighted composition, secret process, patented or unpatented invention, articles or appliances furnished or used under this order, and agrees to defend, at its own expense, any and all actions brought against the SRCSD or bidder because of the unauthorized use of such articles.

**6. CASH DISCOUNTS:** In connection with any cash discount specified on this response, time will be computed from the date of complete delivery of the supplies or equipment as specified, or from date correct invoices are received in the County Auditor's Office, whichever is later. For the purpose of earning the discount, payment is deemed to be made on the date of mailing of the County warrant or check.

**7. DEFAULT BY VENDOR:** In case of default by vendor, SASD or SRCSD may procure the articles or services from other sources and may deduct from any monies due, or that may thereafter become due to the vendor, the difference between the price named in the contract or purchase order and actual cost thereof to the SASD or SRCSD. Prices paid by Regional San must be considered the prevailing market price at the time such purchase is made. Periods of performance may be extended if the facts as to the cause of delay justify such extension in the opinion of Regional San Purchasing Manager.

**8 AWARDS:**

- a. The SASD and SRCSD reserves the right to: (1) award response's received on the basis of individual items, or groups of items, or on the entire list of items, (2) reject any or all response's, or any part thereof; (3) waive any

informality in the responses; and (4) accept the response that is in the best interest of Regional San. The SASD and SRCSD decision shall be final.

- b. Preference for California-made materials. Pursuant to Sections 4330-4333 of the Government Code, Regional San, in awarding the purchase, must prefer supplies partially manufactured, grown or processed in California, price, fitness and quality being equal. In order to receive preference, responses must clearly specify the item(s) for which preference is claimed and the preference applicable.
- 9. RIGHT TO AUDIT:** Regional San reserves the right to verify, by examination of contractor's records, all invoiced amounts when firm prices are not set forth in the purchase agreement.
- 10. ASSIGNMENT:** In submitting a response to a public purchasing body, the responder offers and agrees that if the response is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of part 2 of Division 7 of the Business and Professions Code), arising from the purchases of goods, materials, or services by the quote for sale to the purchasing body pursuant to the quote. Such assignment must be made and become effective at the time the purchasing body tenders final payment to the responder.
- 11. APPLICABILITY TO HEIRS:** Time is of the essence of each and all the provisions of this agreement and, subject to the limitations of Paragraph 12, the provisions of this agreement shall extend to and be binding upon and inure to the benefits of the heirs, executors, administrators, successors, and assigns of the respective parties hereto.
- 12. SPECIAL CONDITIONS:** District standard terms and conditions must govern any contract awarded. If, after award of contract, contractor provides additional terms or conditions, they will be considered void. To the extent not otherwise stated in the contract, the California Commercial Code shall apply.
- 13. CHARGES NOT INCLUDED ON FACE NOT ACCEPTABLE:** No charge will be accepted for packing, boxing, or cartage, except as specified in the Notice of Award. Freight collect shipments will not be accepted. Merchandise will not be accepted if payment is to be made at the time of delivery.
- 14. TITLE:** Except as otherwise expressly provided herein, title to and risk of loss on all items shipped by seller to buyer shall pass to the buyer upon buyer's inspection and acceptance of such items at buyer's building.
- 15. CHANGES WITHOUT NOTICE PROHIBITED:** No changes in price, quantity or merchandise will be recognized by Regional San without written notice of acceptance thereof prior to shipment.
- 16. ALL UNDERSTANDINGS IN WRITING:** It is mutually understood and agreed that no alteration or variation of terms of this award shall be valid unless made in writing and signed by the parties hereto, and that no oral understandings or agreements not incorporated herein, and no alterations or variations of the terms hereof unless made in writing between the parties hereto shall be binding on any of the parties hereto.
- 17. FORCE MAJEURE:** The vendor will not be held liable for failure or delay in the fulfillment of conditions of purchase order/contract if hindered or prevented by fire, strikes, or Acts of God.

**PREVAILING WAGE**

**PREVAILING WAGE** - Pursuant to Section 1770, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are on file at the office of the Clerk of the Board of Supervisors, Suite 2450, 700 "H" Street, Sacramento, California 95814. Copies shall be made available to any interested party on request.

The wage rates determined by the Director of the California Department of Industrial relations refer to expiration dates. Prevailing wage determinations with a single asterisk (\*) after the expiration date which are in effect on the date of advertisement for bids remain in effect for the duration of the project. Prevailing wage determinations with double asterisks (\*\*) after the expiration date indicate that the basic hourly wage rate, overtime and holiday pay rates, and employer payments to be paid for work performed after this date have been determined. If work is to extend past this date, the new rate must be paid and should be incorporated in contracts entered into. The Contractor should contact the prevailing wage unit, DLSR, (415) 703-4281 or the Sacramento County Labor Compliance Section, (916) 875-2700, to obtain predetermined wage changes. All determinations that do not have double asterisks (\*\*) after the expiration date remain in effect for the duration of the project.

The Contractor shall forfeit, as penalty to Regional San, not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing rates for any work done under the contract by him/her or by any subcontractor under the contractor, in violation of the provisions of such Labor Code. The provisions of section 1775 of said labor code shall be complied with.

**PREVAILING WAGES** - Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor code of the State of California, not less than the general prevailing rate of per diem wages, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work contemplated under this Agreement shall be paid to all workers, laborers, and mechanics employed in the execution of said work by Contractor, or by any subcontractor doing or contracting to do any part of said work. The appropriate determination of the Director of the California Department of Industrial Relations is filed with, and available for inspection at the office of, the Clerk of the Governing Board.

Contractor shall post, at each jobsite, a copy of such prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations.

## **GENERAL STATEMENT CONCERNING WORK SITE**

Sacramento Regional Wastewater Treatment Plant, SRWTP, continuously receives and treats wastewater. The work shall be planned and executed without restricting District personnel access, plant operations, or treatment processes. Reliability of plant systems, operations and utilities shall be maintained at all times. Access to facilities and shutdown of operating systems or processes will only be allowed when approved by District.

District has permits to treat and discharge wastewater. These permits establish discharge limits for wastewater, storm water, and air emissions. Violation of District permits shall not result from the work. Any discharge or bypassing shall immediately be reported to the Plant Control Center (PCC).

District will require Contractor to stop or restrict any activity that has or could result in an unauthorized discharge or permit violation. District will prevent or remedy the situation by the most expeditious means. Contractor will be responsible for all costs incurred including fines.

Activities that involve existing operations or facilities require an approved, signed Access Request prior to commencement of work. Interruption of or connection to an existing system, operation, or process requires a Shutdown Plan to be included with the Access Request.

## **REQUIREMENTS FOR COORDINATION AND ACCESS**

Activities that affect the existing plant and operations will require coordination between District and Contractor. Cooperation will be necessary for each party to achieve their respective objectives. Unrestricted access for District personnel and equipment shall be provided to existing facilities, unless a reduced level of access is explicitly allowed in the approved Access Request. District will operate and control existing equipment and facilities at all times. Contractor shall not operate, control, adjust, or restrict access to equipment or facilities. District equipment or facilities shall not be utilized for the work.

Some shutdowns may be required to be scheduled during nights, holidays or weekends.

## **INTERRUPTION OF POWER, CONTROLS, INSTRUMENTATION**

The number and duration of outages of existing power, control and instrumentation systems will be limited. Work shall be completed in a minimum of time. Alternate power sources or generators may be required. Only one power source to a substation may be de-energized at a time. Power, control and instrumentation systems shall be returned to service at the end of each day, except where approved on an Access Request. Work that prevents returning a critical or minimal-shutdown time power, control or instrumentation system to service at the end of the shift shall be continuously pursued to completion utilizing overtime and additional workers as necessary. District will isolate, de-energize, and re-energize existing power, control and instrumentation systems.

## **SAFETY REQUIREMENTS**

- A. All operations shall conform to applicable occupational safety and health standards, rules, regulations and orders which include, but are not limited to: Title 29 of the Code of Federal Regulations and the Electrical, Construction, Tunnel and General Industry Safety Orders issued by the Division of Industrial Safety (Cal/OSHA) of the State of California. In the event of a conflict between the requirements in the referenced standards, the most stringent standard shall prevail.
- B. The Contractor shall submit their IIPP for review or comparable document such as a safety manual.
- C. District reserves the right to stop any work activity that creates a serious safety violation as defined by Cal/OSHA, and Contractor does not take immediate corrective actions.

## ACCESS REQUESTS

An Access Request provides notification of a Work Item or other activity proposed by Contractor. An Access Request describes the contemplated work including when and how it will be accomplished. An Access Request shall be reviewed and submitted by a qualified representative of the Contractor who is familiar with all aspects of the work and all safety requirements. An Access Request is required whenever any of the following conditions are contained in or will be affected by the work but not limited to:

- Hot work
- Transport and use of heavy machinery (>H20 load, i.e. 40,000 lbs)
- Mobilization and demobilization
- Tie-ins, shutdowns, process or utility bypasses
- District personnel or vehicle movement will be restricted
- A roadway (or other access) will be restricted or closed
- Dewatering
- Excavation
- A facility will be modified for construction or demolished,
- A utility, system or process will be interrupted
- Prior to Operational Testing

A fully completed Access Request form shall be submitted **14 days** prior to the date proposed for commencement of work. A separate Access Request is required for each activity, operation or test.

An Access Request describes the activity, indicates the system or equipment that will be affected, lists the labor and equipment to be utilized, indicates the date, time and duration, and describes safety precautions to be observed. Drawing and section numbers shall be indicated where appropriate. A Shutdown plan shall be included with the Access Request when the work affects an operating system or process.

The Contractor shall plan and schedule Access Requests whenever possible. An Access Request will be reviewed and returned within 14 days after submission of all the necessary information. Sufficient information and detail shall be included with an Access Request to permit District to evaluate the proposed operation and the associated risks. Insufficient information on an Access Request may delay approval within 14 days.

Contractor shall not be allowed to proceed with any work, or any portion of the work, described in an Access Request without complying with all the conditions, in their entirety, of the Access request approval. All conditions of approval, including additional safety precautions added by plant safety office, shall be complied with and effectively communicated to Contractor's personnel and subcontractors. If the Contractor does not agree with the additional safety requirements, work shall not start until resolution is attained. Changes in the proposed activities or field conditions of an Access Request will require the submission of a new or revised Access Request.

## **SHUTDOWN PLAN**

A Shutdown Plan shall be included with an Access Request whenever an existing system or facility such as a pipeline, basin, tank, channel, power supply, control circuit, instrumentation, equipment, pump, meter, or structure is restricted or removed from service. A work plan and schedule shall be included. The plan shall indicate each activity with sufficient detail to determine its feasibility. Shutdowns shall be planned and coordinated to minimize the number and duration of activities that affect existing operations.

District will limit the duration of shutdowns of important or critical systems. In addition, Contractor shall comply with the limitations specified in these plans and specification. Stated durations are the total time period between when the system is made available to Contractor and when it is ready for return to service. If Contractor cannot complete the work within the allowed time, he shall immediately request an extension from District. If District does not approve the requested extension, Contractor shall complete the work or return the system to operable condition. District will complete the work if Contractor does not return the system to operable condition as directed. Contractor is responsible for extra costs or damages incurred by Contractor or District to meet these requirements.

### **Requirements:**

Designate the equipment or system that will be affected or removed from service. Describe the work to be undertaken. Identify the portion of the system that will be isolated, dewatered, decommissioned, de-energized, depressurized, or drained.

- List the labor, equipment, materials, tools, utilities and incidental items to be used.
- Describe safety precautions and equipment.
- Describe recovery plan if the shutdown cannot be completed as planned.
- List activities to be done by District.
- Indicate the time estimated to complete the shutdown.

## **SAFETY**

Regional San shall make every possible effort to accommodate the needs of the Contractor, consistent with safety and operational requirements, and in the interest of prompt completion of the work. Contractor shall comply with the requirements of the current District safety Manual, CAL OSHA, and Title 8 and 19 of the California Code of Regulations. In certain areas, Regional San safety requirements exceed California OSHA safety requirements and those safety requirements will be provided prior to the start of the work.

The Contractor shall submit their Workers Compensation Experience Modification Factor (EMF), and the previous year's Cal/OSHA Form 300A-Summary of Work Related Injuries and Illnesses.

### Safety Audits

In accordance with the California Code of Regulations, Title 19, Section 2760.12, Regional San may obtain and evaluate the Contractor's safety performance and programs when work involves performing maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to a covered process (chlorine, sulfur dioxide, and/or digester gas systems). The Contractor shall submit a copy of their current safety program(s) as it pertains to contract work performed on or adjacent to a covered process. Examples of documents required may include items such as safety manuals, I.I.P.P., training documentation, and certification.

Additionally, as part of OSHA's National Emphasis Program (NEP), any contractor or subcontractor working on or adjacent to a covered process during a Process Safety Management (PSM) inspection will also be inspected by OSHA per CPL 02-09-06.

<b>SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT</b>			
<b>ACCESS REQUEST</b>			
Prime Contractor	Contract #	Date	
Sub-Contractor	AR #	Revision	
Contact for Contractor	Work Item #	CPM Activity #	
Phone	<input type="checkbox"/> Work Plan Attached	<input type="checkbox"/> Drawing Attached	
<b>PART 1 – CONTRACTOR WORK PERMIT</b>			
Start Date/Time		Completion Date/Time	
Reference Contract Drawings/Specifications			
Equipment or System to be Worked On			
Location of Work			
Provide RMP/MOC no. for work affecting SRWTP Gas Mgmt. or Chemical Handling Areas:			
Type of Work (check all that apply)	<input type="checkbox"/> Civil	<input type="checkbox"/> Mechanical	<input type="checkbox"/> Electrical
	<input type="checkbox"/> Process	<input type="checkbox"/> Coating	<input type="checkbox"/> Hotwork
	<input type="checkbox"/> Mobilization	<input type="checkbox"/> Traffic/Ped. Access	<input type="checkbox"/> Shutdown
<input type="checkbox"/> Instrumentation			
<input type="checkbox"/> Other (specify)			
Description of Work _____ _____ _____			
Anticipated Hazards _____ _____			
Tools/Equipment to be Used	<input type="checkbox"/> Cutting/Welding Torches	<input type="checkbox"/> Arc Welders	<input type="checkbox"/> Jack Hammers
	<input type="checkbox"/> Power Saws	<input type="checkbox"/> Grinders	<input type="checkbox"/> Pneumatic Tools
	<input type="checkbox"/> Backhoe	<input type="checkbox"/> Crane	<input type="checkbox"/> Radioactive Test Device
<b>Access Request – Page 1 of 3</b>			

**Access Request Instructions**

1. Contractor fills out AR with sufficient information to define the work and anticipated safety hazards and signs at bottom of page 2.
2. R.E. reviews AR and signs on page 3 prior to delivering AR to District Representative.
3. District Representative reviews and approves the AR with conditions, restrictions, or additional Safety items (all additional safety items on page 2 will be initialed).
4. RE gives approved AR back to contractor prior to contractor performing the work.
5. Contractor reviews AR conditions and Safety page prior to beginning work.

Note: For ARs for utility or outside agency work, contractor interacts directly with District Representative.

<b>PART 2 – CONTRACTOR SAFETY PRECAUTIONS</b>	
All items checked will be complied with/used in accordance with applicable safety standards (CalOSHA, UFC, etc.) and the requesting contractor’s safety program.	
<b>HOT WORK PLAN</b> <input type="checkbox"/> Isolate Combustibles <input type="checkbox"/> Fire watch <input type="checkbox"/> Fire Extinguishers <input type="checkbox"/> Flash Protection	<b>REVIEW EMERGENCY PROCEDURES/ALARMS</b> <input type="checkbox"/> Chlorine/Sulfur Dioxide Areas <input type="checkbox"/> Oxygen Handling Areas <input type="checkbox"/> Gas Management Areas <input type="checkbox"/> Other _____
<b>AIR MONITORING</b> <input type="checkbox"/> Continuous <input type="checkbox"/> Periodic <input type="checkbox"/> Frequency _____	<b>HOUSEKEEPING</b> <input type="checkbox"/> Debris Removal <input type="checkbox"/> Dust Control <input type="checkbox"/> Maintain access to/through worksite
<b>POTENTIAL ATMOSPHERIC HAZARDS TO BE MONITORED</b> <input type="checkbox"/> Oxygen Deficiency <input type="checkbox"/> Oxygen Enrichment <input type="checkbox"/> Combustible Gases <input type="checkbox"/> Toxic Gases <input type="checkbox"/> Other _____	<b>EXCAVATION/TRENCHES</b> <input type="checkbox"/> Shoring <input type="checkbox"/> Sloping <input type="checkbox"/> Benching <input type="checkbox"/> Barricades <input type="checkbox"/> Excavation Plan Submittal Number _____
<b>HAZARDOUS MATERIALS TRAINING</b> <input type="checkbox"/> Substance(s) _____	<b>ELEVATED AREAS</b> <input type="checkbox"/> Fall Protection <input type="checkbox"/> Guardrails
<b>ENERGY CONTROL PROCEDURES</b> <input type="checkbox"/> Lockout <input type="checkbox"/> Blockout <input type="checkbox"/> Tagout	<b>PIPING/EQUIPMENT OPENING AND/OR ENTRY</b> (ensure prior to opening) <input type="checkbox"/> Effectively Isolated <input type="checkbox"/> Depressurized <input type="checkbox"/> Drained <input type="checkbox"/> Purged/Flushed of Hazardous Substance(s)
<b>VENTILATION</b> <input type="checkbox"/> Natural only <input type="checkbox"/> Auxiliary, continuous	<b>ABATEMENT ACTIVITIES</b> (Title 8, Construction Safety Orders) <input type="checkbox"/> Asbestos (Article 4 § 1529) <input type="checkbox"/> Lead (Article 4 § 1532.1)
<b>CONFINED SPACE PROCEDURES</b> <input type="checkbox"/> Permit Required <input type="checkbox"/> Personnel Retrieval System <input type="checkbox"/> Non-permit <input type="checkbox"/> Communication w/ Entrant <input type="checkbox"/> C-5 <input type="checkbox"/> Rescue Personnel @ site <input type="checkbox"/> Entry Permit @ site <input type="checkbox"/> Supplied Air	<b>OTHER SAFETY PRECAUTIONS</b> <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<b>AR SUBMITTAL SIGNATURE BLOCK</b>	
Contractor signs below after page 1 and 2 are filled out with sufficient detail to allow AR to be reviewed. Contractor identifies all anticipated safety items prior to signing below. Safety Office staff will initial next to any additional safety items that have been checked off during the AR review process.	
_____ Contractor Representative	_____ Date
Access Request – Page 2 of 3	



_____ Reviewed by Resident Engineer	_____ Date												
PART 3 – APPROVERS’ REMARKS													
Safety Office Comments <span style="float: right;"><input type="checkbox"/> See Attachment</span>													
_____ _____ _____ _____ _____ _____ _____													
_____ Approved By: SRCSD Safety Office	_____ Date												
O&M Support Comments <span style="float: right;"><input type="checkbox"/> See Attachment</span>													
_____ _____ _____ _____ _____ _____ _____													
_____ Approved By: SRCSD O&M Support	_____ Date												
SIGNATURE BLOCK													
The work described by this Access Request has been reviewed. The work methods described and identified in Parts 1 & 2, and the additional safety precautions identified in Parts 2 & 3 will be complied with and effectively communicated to personnel assigned this task. If the contractor does not agree with additional safety precautions, work shall not start until resolution is attained.													
_____ Contractor Representative	_____ Date												
Access Request – Page 3 of 3													
<b>Distribution:</b> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Operation Support</td> <td><input type="checkbox"/> O&amp;M Manager 1 (2)</td> <td><input type="checkbox"/> Electrical Supervisor</td> </tr> <tr> <td><input type="checkbox"/> Safety Officer</td> <td><input type="checkbox"/> Process Team Leader</td> <td><input type="checkbox"/> Facility Maintenance</td> </tr> <tr> <td><input type="checkbox"/> Resident Engineer</td> <td><input type="checkbox"/> Ops Support Supervisor</td> <td><input type="checkbox"/> Project Engineer</td> </tr> <tr> <td><input type="checkbox"/> Contractor (supplied by RE)</td> <td><input type="checkbox"/> Other _____</td> <td></td> </tr> </table>		<input type="checkbox"/> Operation Support	<input type="checkbox"/> O&M Manager 1 (2)	<input type="checkbox"/> Electrical Supervisor	<input type="checkbox"/> Safety Officer	<input type="checkbox"/> Process Team Leader	<input type="checkbox"/> Facility Maintenance	<input type="checkbox"/> Resident Engineer	<input type="checkbox"/> Ops Support Supervisor	<input type="checkbox"/> Project Engineer	<input type="checkbox"/> Contractor (supplied by RE)	<input type="checkbox"/> Other _____	
<input type="checkbox"/> Operation Support	<input type="checkbox"/> O&M Manager 1 (2)	<input type="checkbox"/> Electrical Supervisor											
<input type="checkbox"/> Safety Officer	<input type="checkbox"/> Process Team Leader	<input type="checkbox"/> Facility Maintenance											
<input type="checkbox"/> Resident Engineer	<input type="checkbox"/> Ops Support Supervisor	<input type="checkbox"/> Project Engineer											
<input type="checkbox"/> Contractor (supplied by RE)	<input type="checkbox"/> Other _____												

\*\* END OF SECTION \*\*

## **INSTRUCTIONS FOR BID SECURITY**

No Bid will be considered unless it is accompanied by a bid security in the form of a certified check or a cashier's check, payable to the order of the SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT, for the sum not less than ten percent (10%) of the total Bid amount, or a Bidders Bond in the same amount executed as surety by a corporation acceptable to Regional San and authorized to issue such surety bonds in the state of California. Payment of the security in cash or personal check will not be acceptable.

Within fifteen (15) calendar days after execution by Regional San of the Contract and in any event not later than ninety (90) calendar days after the bid opening, Regional San will return to each bidder the bid security which accompanied its bid, except such security which may have been forfeited in accordance with the bid request.

---

**Firm Name**

---

**Signature**

---

**Printed Name**

---

**BID GUARANTY BOND**  
Bid Form

KNOW ALL PERSONS BY THESE PRESENTS:

THAT \_\_\_\_\_, hereinafter called the Principal, and \_\_\_\_\_, hereinafter called the Surety, are jointly and severally held and firmly bound unto the Sacramento Regional County Sanitation District, hereinafter called the Obligee, each in the penal sum of 10 percent of the total amount of the bid of the Principal for the work, this sum not to exceed \_\_\_\_\_ dollars (\$ \_\_\_\_\_) of lawful money of the United States for the payment thereof unto the Obligee, the Principal and Surety jointly and severally bind themselves forever firmly by these presents.

WHEREAS, the Principal is herewith submitting its offer for the fulfillment of Obligee's contract for MS Tank No. 1 Steel Shell Replacement Project, RFB #8224.

NOW, THEREFORE, the condition of this obligation is such that if the Principal is awarded the contract, and if the Principal, within the time specified in the bid for such contract, enters into, executes, and delivers to the Obligee an agreement in the form provided herein complete with evidences of insurance, and if the Principal within the time specified in the bid gives to the Obligee the performance and payment bonds on the form provided herein, then this obligation shall be void; otherwise, the Principal and Surety will pay unto the Obligee the difference in money between the total amount of the bid of the Principal and the amount for which the Obligee legally contracts with another party to fulfill the contract if the latter amount be in excess of the former, but in no event shall the Surety's liability exceed the penal sum hereof.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable under this obligation as Principal, and that nothing of any kind or nature whatsoever that will not discharge the Principal shall operate as a discharge or a release of liability of the Surety.

IT IS HEREBY FURTHER DECLARED AND AGREED that this obligation shall be binding upon and inure to the benefit of the Principal, the Surety, and the Obligee and their respective heirs, executors, administrators, successors and assigns.

SIGNED AND SEALED this \_\_\_\_\_ day of \_\_\_\_\_, 2015.

(SEAL)

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Signature for Principal

\_\_\_\_\_  
Title of Signatory

(SEAL)

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Signature for Surety

\_\_\_\_\_  
Title of Signatory

## **INSTRUCTION FOR PERFORMANCE BOND**

The successful Bidder shall be required to execute through a corporate surety the Labor and Material Bond included herein. The successful Bidder and surety shall be held and firmly bound unto Regional San in the penal sum equal to 100% of the total Contract amount. The entire cost of the bond shall be borne by the successful Contractor.

The successful Bidder agrees to execute and have notarized the Labor and Material Bond and deliver to Regional San within ten (10) working days after notice of intent to award the contract. These bonds will be provided to Regional San at the pre-construction meeting.

---

**Firm Name**

---

**Signature**

---

**Printed Name**

---

### PERFORMANCE BOND

BOND NO. \_\_\_\_\_

KNOW ALL PERSONS BY THESE PRESENTS, that

WHEREAS, the Governing Board of the Sacramento Regional County Sanitation District, a political subdivision of the State of California, hereinafter designated as the "Obligee," has, on \_\_\_\_\_ awarded to \_\_\_\_\_, hereinafter designated as the "Principal," a contract for MS Tank No. 1 Steel Shell Replacement Project, RFB # 8224 and

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

NOW, THEREFORE, WE, the Principal, and \_\_\_\_\_

as Surety, are held and firmly bound unto the Obligee, in the penal sum of \_\_\_\_\_, lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

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

As a condition precedent to the satisfactory completion of the said contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, its heirs, executors, administrators, successors or assigns shall fail to make full, complete and satisfactory repair and replacements or totally protect the said Obligee from loss or damage made evident during said period of one (1) year from the date of acceptance of the work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Principal remains.

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

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this \_\_\_\_\_ day of \_\_\_\_\_, 2015, the name and corporate seal of each corporate party being affixed hereto and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Signature for Principal

\_\_\_\_\_  
Title of Signatory

(SEAL)

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Signature for Surety

\_\_\_\_\_  
Title of Signatory

(This bond must be submitted in sets of two, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. Bonds must be accompanied by a current power of attorney appointing such Attorney-In-Fact.)

## **INSTRUCTIONS FOR PAYMENT BOND**

The successful Bidder shall be required to execute through a corporate surety the Payment Bond included herein. The successful Bidder and surety shall be held and firmly bound unto Regional San in the penal sum equal to 100% of the total Contract amount. The entire cost of the bond shall be borne by the successful Contractor.

The successful Bidder agrees to execute and have notarized the Labor and Material Bond and deliver to Regional San within ten (10) working days after notice of intent to award the contract. These bonds will be provided to Regional San at the pre-construction meeting.

---

**Firm Name**

---

**Signature**

---

**Printed Name**

---

**PAYMENT BOND**

BOND NO. \_\_\_\_\_

KNOW ALL PERSONS BY THESE PRESENTS, that

WHEREAS, the Governing Board of the Sacramento Regional County Sanitation District, a political subdivision of the State of California, hereinafter designated as the "Obligee," has, on \_\_\_\_\_ awarded to \_\_\_\_\_, hereinafter designated as the "Principal," a contract for the MS Tank No. 1 – Steel Shell Replacement Project, RFB #8224 and

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

NOW, THEREFORE, WE, the Principal, and \_\_\_\_\_

\_\_\_\_\_ as Surety, are held and firmly bound unto the Obligee, in the penal sum of \_\_\_\_\_, lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

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

As a condition precedent to the satisfactory completion of the said contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, its heirs, executors, administrators, successors or assigns shall fail to make full, complete and satisfactory repair and replacements or totally protect the said Obligee from loss or damage made evident during said period of one (1) year from the date of acceptance of the work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Principal remains.

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

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this \_\_\_\_\_ day of \_\_\_\_\_, 2015, the name and corporate seal of each corporate party being affixed hereto and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

\_\_\_\_\_  
Principal

By \_\_\_\_\_  
Signature of Principal



\_\_\_\_\_  
Title of Signatory

\_\_\_\_\_  
Surety

By \_\_\_\_\_  
Signature for Surety

(SEAL)

\_\_\_\_\_  
Title of Signatory

(This bond must be submitted in sets of two, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. Bonds must be accompanied by a current power of attorney appointing such Attorney-In-Fact.)

**SUBCONTRACTORS**

R-1    Work \$ AMT    % of Work

Account Name			
Address			
Contact Person/Title			
Phone Number			
Service Provided/Year			
DIR Registration # CSLB #			

R-2    Work \$ AMT    % of Work

Account Name			
Address			
Contact Person/Title			
Phone Number			
Service Provided/Year			
DIR Registration # CSLB #			

R-3    Work \$ AMT    % of Work

Account Name			
Address			
Contact Person/Title			
Phone Number			
Service Provided/Year			
DIR Registration # CSLB #			

## CONTRACTOR LICENSE CERTIFICATION

Pursuant to the Business and Professions Code of the State of California, Section 7030:

“Contractors are required by law to be licensed and regulated by the Contractors State License Board. Any questions concerning a contractor may be referred to the Registrar, Contractors State License Board, 9821 Business Park Drive, Sacramento, California 95827, Mailing Address: P.O. Box 26000, Sacramento, California 95826.”

The undersigned Contractor certifies that it is now licensed in accordance with the provisions of the Contractor’s License Law of the State of California, and the number of said license is \_\_\_\_\_, and the classification of said license is \_\_\_\_\_, and the said license expires \_\_\_\_\_.

\_\_\_\_\_  
*Company Name*

\_\_\_\_\_  
*Business Address*

By: \_\_\_\_\_  
*Authorized Signature*

\_\_\_\_\_  
*Type or Print Name*

\_\_\_\_\_  
*Title*

Dated: \_\_\_\_\_

**Corporate Seal**

If Contractor is a Corporation

State of Incorporation:

## **EXCEPTIONS RESPONSE PAGE**

List any exceptions to the criteria requested above. Site the Item number, RFB page, paragraph number, and a description of the exception. If no exceptions are listed proposal will be deemed to have no exceptions.

## **CONTRACTOR EXPERIENCE STATEMENT**

The following is a description of the bidder's experience with work similar in magnitude and character to that contemplated under this Contract. Additional numbered pages outlining this portion of the bid may be attached to this page. Each page shall be headed CONTRACTOR EXPERIENCE STATEMENT and shall be signed by the bidder.

## NON-COLLUSION DECLARATION

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].”

Signature \_\_\_\_\_

## **AGREEMENT for MS Tank No. 1 Steel Shell Replacement Project**

THIS AGREEMENT made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2017, between the Sacramento Regional County Sanitation District, a political subdivision of the State of California, hereinafter referred to as "District" and \_\_\_\_\_, hereinafter referred to as "Contractor";

### WITNESSETH

WHEREAS, Regional San heretofore caused plans and specifications for the work hereinafter mentioned to be prepared, and therefore did approve and adopt said plans and specifications; and

WHEREAS, Regional San did cause to be published for the time and in the manner required by law, a Notice to Contractors inviting sealed bids for the performance of said work; and

WHEREAS, the Contractor, in response to such Notice, submitted to Regional San within the time specified in said Notice, and in the manner provided for therein, a sealed bid for the performance of the work specified in said plans and specifications, which said bid, and the other bids submitted in response to said Notice, Regional San publicly opened and canvassed in the manner provided by law; and

WHEREAS, the Contractor was the lowest responsible bidder for the performance of said work, and Regional San, as a result of the canvass of said bids, did determine and declare Contractor to be the lowest responsible bidder for said work and award to it a contract therefor.

NOW, THEREFORE, in consideration of the promises herein, it is mutually agreed between the parties hereto as follows:

**I. CONTRACT DOCUMENTS:**

The following documents are by this reference incorporated in and made a part of this Agreement: The Standard Construction Specifications adopted by the Sacramento County Board of Supervisors on July 17, 2001, revised March, 2004; the Special Provisions; the contract drawings, all addenda; the Notice to Contractors; the Proposal; all required bonds; and all supplemental Agreements covering alterations, amendments, or extensions to the contract. The documents which describe the work to be performed are sometimes collectively referred to herein as the Plans and Specifications. In the case of conflicting documents this agreement takes precedent over all others.

**II. SCOPE OF WORK:**

The Contractor shall furnish all labor, equipment, and materials, required for the RFB #8224, MS Tank No. 1 Steel Shell Replacement Project, as provided for and set forth in said plans and specifications, or in either of them, which said plans and specifications are hereby referred to and by such reference incorporated herein and made a part of this Agreement.

All of the said work done under this Agreement shall be under the supervision of and performed to the satisfaction of the Engineer of District who shall have the right to reject any and all materials and supplies furnished by the Contractor which do not comply with said Scope of Work and plans and specifications, together with the right to require the Contractor to replace any and all work furnished by the Contractor which shall not be in strict accordance with said plans and specifications.

**III. COMPLETION:**

Said work shall be completed and ready for acceptance as indicated on the list of Key Action Dates under the Construction Completion.

IV. PAYMENT:

Attached hereto as Exhibit "A" [Cost Response Page] and by reference made a part hereof, is the bid and proposal of Contractor. Said bid and proposal containing, as required by the terms of said specifications, the full and complete schedule of the different items with the lump sums or unit prices as so specified. Regional San agrees, in consideration of the work to be performed herein and subject to the terms and conditions hereof, to pay Contractor all sums of money which may become due to Contractor in accordance with the terms of the aforesaid bid and proposal, and this Agreement, with: \_\_\_\_\_ . Said sum shall be paid in accordance with Section 8 of the Standard Specifications. With respect to that portion of the above sum as is based upon the estimated quantities specified for the general scope of the work to be performed herein, actual payment will be based upon the quantities as measured upon completion. No payment made under this Contract shall be construed to be an acceptance of defective work or improper materials.

V. PREVAILING WAGES:

Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor Code of the State of California, not less than the general prevailing rate of per diem wages, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work contemplated under this Agreement shall be paid to all workers, laborers and mechanics employed in the execution of said work by Contractor, or by any subcontractor doing or contracting to do any part of said work. The appropriate determination of the Director of the California Department of Industrial Relations is filed with, and available for inspection at the office of, the Clerk of the Governing Board.

Contractor shall post, at each jobsite, a copy of such prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations.

VI. INSURANCE:

The Contractor shall carry and maintain during the life of this Agreement, such public liability, property damage and contractual liability, auto, workers' compensation and builders risk insurance as required by Section 3-9 of the Standard Construction specifications.

VII. WORKER'S COMPENSATION CERTIFICATE:

By execution of this Agreement, the Contractor certifies as follows:

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

VIII. PERFORMANCE AND PAYMENT BONDS:

The Contractor shall, before beginning said work, file two bonds with Regional San, each made payable to Regional San. These bonds shall be issued by a surety company authorized to do business in the State of California, and shall be maintained during the entire life of the Agreement at the expense of the Contractor. One bond shall be in the amount of one hundred percent (100%) of the Agreement and shall guarantee the faithful performance of the Agreement. The second bond shall be the payment bond required by Division 3, Part 4, Title 15, Chapter 7, of the Civil Code of the State of California, and shall be in the amount of one hundred percent (100%) of the Agreement. Any alterations made in the specifications which are a part of this Agreement or in any provision of this Agreement shall not operate to release any surety from liability on any bond required hereunder and the consent to make such alterations is hereby given, and any surety on said bonds hereby waives the provisions of California Civil Code Sections 2819 and 2845.

IX. INDEMNIFICATION:

To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless Regional San and the County of Sacramento, its governing Boards, officers, directors, officials, employees, and authorized volunteers and agents, (collectively "Indemnified Parties") from and against any and all claims, demands, actions, losses, liabilities, damages, and all expenses and costs incidental thereto (collectively "Claims") including cost of defense, settlement, arbitration, and reasonable attorneys' fees, resulting from injuries to or death of persons, including but not limited to



employees of either Party hereto, and damage to or destruction of property or loss of use thereof, including but not limited to the property of either Party hereto, arising out of, pertaining to, or resulting from the acts or omissions of the Contractor, its officers, employees, or agents, or the acts or omissions of anyone else directly or indirectly acting on behalf of the Contractor, or for which the Contractor is legally liable under law regardless of whether caused in part by an Indemnified Party. Contractor shall not be liable for any Claims to the extent caused by the active negligence of an Indemnified Party where such indemnification would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

This indemnity shall not be limited by the types and amounts of insurance or self-insurance maintained by the Contractor or the Contractor's Subcontractors.

Nothing in this Indemnity shall be construed to create any duty to, any standard of care with reference to, or any liability or obligation, contractual or otherwise, to any third party.

The provisions of this Indemnity shall survive the expiration or termination of the Agreement.

X. MISCELLANEOUS PROVISIONS:

- a. This Agreement shall bind and inure to the heirs, devisees, assignees, and successors in interest of Contractor and to the successors in interest of District in the same manner as if such parties had been expressly named herein.
- b. All times stated herein or in the Contract Documents are of the essence hereof.
- c. As used in this instrument the singular includes the plural, and the masculine includes the feminine and the neuter.
- d. This Agreement may create a possessory interest subject to property taxation, and Contractor may be subject to the payment of property taxes levied on such interest.

XI. TRENCH EXCAVATION; PLAN FOR PROTECTION FROM CAVING:

That excavation of any trench or trenches 5 feet or more in depth and involving estimated expenditures in excess of Twenty-Five Thousand Dollars (\$25,000) shall require, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection prepared by a California registered civil or structural engineer.

IN WITNESS WHEREOF, District and Contractor have caused this Agreement to be executed as of the day and year first above written.

SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT

By \_\_\_\_\_

Tamblynn Stewart  
Contact Services Officer

\_\_\_\_\_

\_\_\_\_\_

By \_\_\_\_\_

Authorized Representative

By \_\_\_\_\_

Authorized Representative

## CONTRACTOR WARRANTY

The Contractor agrees to use and abide by the conditions of the following guarantee which shall be signed and delivered to Regional San before the final payment is made:

GUARANTEE FOR: Sacramento Regional County Sanitation District (SRCSD)

PROJECT: RFB # 8224 MS Tank No. 1 Steel Shell Replacement Project

We hereby guarantee that the work completed under RFB # 8224 has been furnished in accordance with the drawings and specifications and that the Work as constructed will fulfill the requirements of the guarantee included in the specifications. We agree to repair or replace any or all of our work and any consequential damages to other improvements, together with any other adjacent work which may be displaced in so doing, that may prove to be defective in its workmanship or materials within a period of one (1) year from the date of acceptance of the above named facility by Regional San without any expense whatsoever to said District, ordinary wear or tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within 10 days after receipt of written notice from Regional San, Regional San is hereby authorized to make such repairs at our expense without further notice and without any notice to the surety. However, in case of emergency where, in the opinion of Regional San's Representative, delay would cause serious loss or damages, or a serious hazard to the public, the repairs may be made or lights, signs, and barricades erected, without prior notice to us or surety, and we shall pay the entire costs thereof. We do hereby authorize said District to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand.

Date: \_\_\_\_\_

Signed: \_\_\_\_\_

Contractor

## **SECTION 01 30 00**

### **SUBMITTALS**

#### **PART 1 -- SUBMITTALS**

##### **1.01 GENERAL**

- A. A submittal consists of descriptive literature, information, plans, calculations, test data, details and drawings for items proposed for the Work. Sufficient information shall be provided to demonstrate compliance with the Contract Documents. A sample or mock-up of a product or material shall be included with a submittal where required.
- B. A submittal is required for all materials, products, equipment, or systems that that will become part of the Work. Specific submittal requirements are indicated in the respective specification sections. Components or items that comprise a unit or system shall be packaged in a single submittal.
- C. Submittal information and drawings from subcontractors and suppliers shall be coordinated, reviewed and submitted by Contractor.
- D. District and Design Consultant will review submittals for conformance with the Contract Documents, codes and standards. Review does not indicate suitability or acceptability.
- E. A submittal does not relieve, alter, waive or change the requirements of the Contract Documents. Alternates or substitutions shall not be proposed in a submittal.
- F. District does not have a duty to identify inconsistencies, errors, fit-up requirements or to determine compatibility of the proposed items. Coordination and compatibility of individual submittals is the responsibility of Contractor. Contractor shall verify all dimensions, measurements and quantities required for a submittal.
- G. A resubmittal is required whenever a change occurs affecting a prior submittal.

##### **1.02 PROCEDURE**

- A. A complete list of submittals shall be furnished within 5 days following the Notice to Proceed. District will review the list and return within 2 days.
- B. Submittals shall be consecutively numbered. Resubmittals shall use the prior number with a sequential letter suffix.
- C. Sufficient information shall be provided to describe what is proposed. The applicable sections of the Contract Documents shall be listed.

- D. Submittals with more than one item shall have sections for the respective items. Items shall be clearly identified.
- E. Submittals shall be complete and shall be timely in submission to avoid delay of the Work. The priority of each submittal shall be indicated. The schedule shall provide time for preparation and review of submittals and resubmittals.
- F. All deviations and exceptions to the Contract Documents shall be conspicuously noted in the submittal and transmittal form.
- G. Submittals may be either hard copy or electronic. Each copy shall include a transmittal form. Hard copies shall be high quality, full-size, legible on plain bond paper. Digital or electronic version shall be compatible with standard Microsoft Office software or in Portable Document Format (pdf). It is recommended that drawings be produced using the most current AutoCAD software by Autodesk, Inc. Compact Discs or portable storage media that connects via USB, shall be provided for CAD generated drawings.
- H. Each submittal will be reviewed, rated and returned.
- I. All submittals shall be originals or first generation plain bond photo copies. Multiple generation photo copies and FAX transmittals are not acceptable if, in the opinion of the District's Representative, they are of reduced legibility. Minimum size lettering height on all submittals shall be 12 point for typewritten documents, 1/16 inch height for 8-1/2 x 11 inch and 11 x 17 inch documents, and 1/8 inch height for documents larger than 11 x 17.
- J. Shop drawings shall have drawing numbers, scale, revision date and number, Contractor name, subcontractor name, supplier name, name of detailer or engineer who prepared the document, relation to adjacent structures, materials, drawing cross references, standard references, Contractor's certification stamp, and registered engineer's stamp, if required, shown on them.
- K. Submittals shall be transmitted with a transmittal form containing the following information as a minimum:
  - 1. Date.
  - 2. Submittal or resubmittal number.
  - 3. Contract title and number.
  - 4. Contractor's name and address.
  - 5. List of documents being submitted, by preparer, number and version.
  - 6. Contract documents references (including specific specification section and drawing numbers) for each submittal document.

7. Previous submittal number and item number for each submittal document.
8. Notification of deviation(s) from contract documents for each submittal document.
9. Contractor's certification of having reviewed and coordinated the submittal.
10. Description of intended use in this contract.

### **1.03 REVIEW**

- A. Up to 10 submittals per week will be reviewed. Review time will be approximately 7 calendar days. Additional review time will be required for large complex submittals or if more than 10 submittals are submitted within a week. Submittals for "or equal" items will require approximately 14 days for review. Resubmittals will require approximately 7 days for review.
- B. Submittals that are incomplete or do not demonstrate compliance with the Contract Documents will be returned without review.
- C. Review Criteria:
  1. "A" indicates the submittal conforms to the Contract Documents.
  2. "B" indicates the submittal would conform to the Contract Documents after review comments have been incorporated.
  3. "C" indicates that changes or additional information are necessary to comply with the Contract Documents. A resubmittal is required.
  4. "D" indicates that the submittal does not comply with the Contract Documents. A resubmittal is necessary.
  5. "E" indicates that the submittal has not been compared with the Contract Documents.
  6. "F" indicates that the submittal has been received and no action is needed by District.

**\*\*END OF SECTION\*\***

## SECTION 03 15 20

### ANCHORAGE IN CONCRETE AND MASONRY

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. This section specifies anchor bolts complete with washers and nuts. Unless otherwise specified, anchor bolts shall be 316 stainless steel.

###### B. SPECIAL INSPECTION:

1. Special inspection of anchor bolts shall be performed by the Special Inspector under contract with the District and in accordance with the CBC Chapter 17.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
CBC	California Building Code, 2010 Edition
ACI 318	American Concrete Institute - Building Code Requirements for Structural Concrete, and Commentary
ACI 350	American Concrete Institute - Code Requirements For Environmental Engineering Concrete Structures, and Commentary
ASTM A36	Structural Steel
ASTM A 193/A	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 194/A	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
ASTM A320	Alloy Steel Bolting Materials for Low-Temperature Service
ASTM A325	Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A354	Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

<u>Reference</u>	<u>Title</u>
ASTM A449	Quenched and Tempered Steel Bolts and Studs
ASTM A490	Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
ASTM A 563	Standard Specification for Carbon and Alloy Steel Nuts
ASTM A572	Standard Specification for High Strength Low Alloy Columbium Vanadium Structural Steel
ASTM F593	Stainless Steel Bolts, Hex Cap Screws and Studs
ASTM F594	Stainless Steel Nuts
ASTM F1554	Anchor Bolts, Steel, 36, 55, 105-ksi Yield Strength

B. DEFINITIONS: (Not Used)

### **1.03 SUBMITTALS**

- A. The following information shall be submitted for review in accordance with SUBMITTALS PROCEDURES Section (01 33 00) for all bolt systems not cast-in-place:
1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
  2. Data indicating load capacities.
  3. Chemical resistance.
  4. Temperature limitations.
  5. Installation instructions.
  6. Manufacturer's data and catalogue numbers.
  7. All post installed anchors and adhesive shall be listed with at least one of the following agencies, ICC & ICC (ES). Submit ICC evaluation reports for adhesive anchors as specified in paragraphs 3.02-B and 3.02-C of this specification section, respectively.
  8. Design calculation in accordance with paragraph 2.04 of this specification section.

### **1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

## **PART 2 -- PRODUCTS**

### **2.01 GENERAL**

- A. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 25 percent, up to a limiting maximum oversizing of 1/4 inch. Minimum anchor bolt diameter shall be 1/2 inch. Anchor bolts shall be furnished with leveling nuts, the faces of which shall be tightened against flat surfaces as shown to not less than 10 percent of the bolt's safe tensile stress.
- B. Tapered washers shall be provided where mating surface is not square with the nut.
- C. Expansion, wedge or adhesive anchors set in holes drilled in the concrete after the concrete is placed will not be permitted in substitution for anchor bolts except where otherwise specified. Upset threads shall not be acceptable.

### **2.02 MATERIALS**

- A. Anchor bolt materials shall be as specified in Table A unless otherwise specified on the contract drawings.

### **2.03 ANTI-SEIZE COMPOUND**

- A. All stainless steel embedded bolts, expansion anchors, and adhesive anchors shall be assembled with a stainless steel anti-seize compound such as molycote.
- B. All existing steel embedded anchor bolts shall be coated with an anti-seize compound such as Denso Paste or zinc anti-seize.

### **2.04 DESIGN**

- A. Anchor bolts for equipment frames and foundations shall be designed in accordance with the CBC. The contractor designed anchor bolts are differed approval, and the “stamped” calculations and drawing shall be submitted to the engineer of record for review of general complaisance with design intent. Calculations and shop drawings shall be submitted with the equipment submittal in accordance with the SUBMITTAL PROCEDURES Section (01 30 00) for all anchorage details. All calculations must be made and signed by a civil or structural engineer currently registered in the State of California.
- B. All anchor bolts resisting seismic forces shall be design based on cracked concrete requirement in ACI 318 or ACI 350, Appendix D.



Table A – Anchor Bolt Materials

Material	Specification
Stainless Steel Anchor Bolts	ASTM A193, Grade B8M Class 1, AISI 316 or ASTM A320, Grade B8M Class 1, AISI 316
Stainless Steel Threaded Rods at Adhesive Anchors	ASTM F593 CW1 (1/4" to 5/8" Rod) ASTM F593 CW2 (3/4" to 1 1/2" Rod)
Stainless Steel Nuts and Washers	ASTM A194 Grade 8M, SS316 Nuts with Type 316 SS Washers (ASTM F594 Group 2 Type 316 SS Nuts at Adhesive Anchors)
Concrete Adhesive Anchoring System	HILTI HIT-RE 500-SD, SIMPSON STRONG-TIE SET-XP, or equal.
Masonry Adhesive Anchoring System	HILTI "HIT-HY 150 MAX", or equal

## **PART 3 -- EXECUTION**

### **3.01 GENERAL**

- A. Fieldwork, including cutting and threading, shall not be permitted on galvanized items. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators. Grouting of anchor bolts with nonshrink or epoxy grouts, where specified, shall be in accordance with the GROUTING Section (03 60 00). All stainless steel anchor bolts and fasteners shall be assembled with stainless steel anti-seize compound.

### **3.02 INSTALLATION**

#### **A. CAST-IN-PLACE ANCHOR BOLTS:**

1. Anchor bolts to be embedded in concrete shall be placed accurately and held in correct position while the concrete is placed. Only where specifically shown on the contract plans recesses or blockouts shall be formed in the concrete and the metalwork shall be grouted in place in accordance with the GROUTING Section (03 60 00) after strength is attained. The surfaces of metalwork in contact with concrete shall be thoroughly cleaned.
2. After anchor bolts have been embedded, their threads shall be protected by grease and the nuts run on.
3. For grouting of anchor bolts, use non-shrink, non-metallic grout as specified in the GROUTING Section (03 60 00).

#### **B. ADHESIVE ANCHORS:**

1. Use of adhesive or capsule anchors shall be as shown on the contract drawings and shall be subject to the following conditions:
  - a. Use shall be limited to locations where exposure, on an intermittent or continuous basis, to acid concentrations higher than 10 percent, to chlorine gas, or to machine or diesel oils, is extremely unlikely.
  - b. Use shall be limited to applications where exposure to fire or exposure to concrete or rod temperature above 120 degrees F is extremely unlikely. Overhead applications (such as pipe supports), because of the above concerns, shall be disallowed.
  - c. Approval from District Representative for specific application and from supplier of equipment to be anchored, if applicable.

- d. Anchor diameter and grade of steel shall be per contract documents or per equipment supplier specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils.
  - e. Embedment depth shall be as specified on the drawings. Adhesive capsules of different diameters may be used to obtain proper volume for the embedment, but no more than two capsules per anchor may be used. When installing different diameter capsules in the same hole, the larger diameter capsule shall be installed first. Any extension or protrusion of the capsule from the hole is prohibited.
  - f. All installation recommendations by the anchor system manufacturer shall be followed carefully, including, but not limited to, maximum hole diameter, minimum embedment, and minimum edge distance.
  - g. Holes shall have rough surfaces, such as can be achieved using a rotary percussion drill.
  - h. Holes shall be blown clean with compressed air and be free of dust or standing water prior to installation.
  - i. Anchor shall be left undisturbed and unloaded for full adhesive curing period.
  - j. Concrete temperature (not air temperature) shall be compatible with curing requirements of adhesives per adhesive manufacturer. Anchors shall not be placed in concrete below 25 degrees F.
2. The Contractor shall supply the District Representative with the current ICC evaluation report from the ICC Evaluation Services for the particular brand of adhesive anchors to be used.

**3.03 TESTING (NOT USED)**

**3.04 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***

## SECTION 03 60 00

### GROUTING

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. This section specifies grout for uses other than masonry.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall govern.

<u>Reference</u>	<u>Title</u>
ASTM C33	Concrete Aggregates
ASTM C40	Test Method for Organic Impurities in Fine Aggregates for Concrete
ASTM C88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Test Method for Materials Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C136	Method for Sieve Analysis of Fine and Coarse Aggregates
ASTMC150	Portland Cement
ASTMC289	Test Method for Potential Reactivity of Aggregates (Chemical Method)
ASTMC494	Chemical Admixtures for Concrete
ASTM C881	Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C1107	Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTMD2419	Test Method for Sand Equivalent Value of Soils And Fine Aggregate
ASTME329	Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction

B. DEFINITIONS: (Not Used)

**1.03 SUBMITTALS**

A. The following information shall be submitted for review in accordance with the SUBMITTAL PROCEDURES Section (01 33 00):

1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviation.
2. MANUFACTURER'S DATA:
  - a. Nonshrink grout
  - b. Epoxy injection system and installer certification
  - c. Admixtures (if used)
  - d. Bonding compounds
  - e. Current ICC Evaluation Report for adhesives used for dowel and anchor setting.

B. LABORATORY TEST REPORTS:

1. Before delivery of materials, the reports of the tests specified herein shall be submitted. Test reports on previously tested materials shall be accompanied by the manufacturer's statement that the previously tested material is the same type, quality, manufacture, and make as that proposed for use in this project. Test reports are required for the following:
  - a. Cement
  - b. Aggregates
  - c. Admixtures
  - d. Bonding compounds
  - e. Epoxy Resin
2. To demonstrate conformance with the specified requirements for grout, the Contractor shall provide the services of an independent testing laboratory which complies with the requirements of ASTM E329. The testing laboratory shall sample and test grout materials as required in this section. Costs of testing laboratory services shall be borne by the Contractor.

C. EVIDENCE OF TESTING LABORATORY COMPETENCE:

1. The Contractor shall require that the laboratory provide directly to the District Representative evidence of the most recent inspection of its facilities by the Cement and Concrete Reference Laboratory of the National Bureau of Standards. The evidences shall show that deficiencies mentioned in the report of that inspection have been corrected. The evidence of inspection shall be submitted and approved prior to delivery of materials to the job site.

**1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

**PART 2 -- PRODUCTS**

**2.01 MATERIALS**

**A. CEMENT:**

1. Portland cement shall be ASTM C150, Type II or Type V, low alkali, containing less than 0.60 percent by weight of alkalies.

**B. AGGREGATE:**

1. **GENERAL:** Aggregate shall be nonreactive and shall be washed before use.
  - a. When sources of aggregate are changed, test reports shall be provided for the new material. The tests specified shall be performed submitted and approved prior to commencing grout work.
2. **FINE AGGREGATE:** Fine aggregate shall be hard, dense, durable particles of either sand or crushed stone regularly graded from coarse to fine and shall conform to ASTM C33 as modified herein. When tested in accordance with ASTM C136, gradation shall be such that 100 percent by weight will pass a standard No. 8 mesh sieve and no less than 45 percent by weight will pass a standard No. 40 mesh sieve.
  - a. Variation from the specified gradations in individual tests will be acceptable if the average of three consecutive tests is within the specified limits and the variation is within the permissible variation listed below:

<b>U.S. standard sieve size</b>	<b>Permissible variation in individual test, percent</b>
30 or coarser	2
50 or finer	0.5

3. Other tests shall be in accordance with the following specifications:

<b>Test</b>	<b>Test Method</b>	<b>Requirements</b>
Organic Impurities	ASTM C40	Color lighter than standard
Amount of Material Passing No. 200 Sieve	ASTM C117	3% maximum by weight
Soundness	ASTM C88	10% maximum loss with sodium sulfate
Reactivity	ASTM C289	Innocuous aggregate
Sand Equivalent	ASTM D2419	Minimum 80

**C. ADMIXTURES:**

1. **GENERAL:** Admixtures shall be compatible with the grout. Calcium chloride or admixtures containing calcium chloride are not acceptable. Admixtures shall be used in accordance with the manufacturer's recommendations and shall be added separately to the grout mix.
2. **CONCRETE SEALER:** Penetrating concrete sealing admixture. Moxie 1800 Super Admix, or equal.

**D. WATER:**

1. Water for washing aggregate, for mixing and for curing shall be free from oil and deleterious amounts of acids, alkalis, and organic materials; shall not contain more than 1000 mg/l of chlorides as Cl, nor more than 1300 mg/l of sulfates as SO<sub>4</sub>; and shall not contain an amount of impurities that may cause a change of more than 25 percent in the setting time of the cement nor a reduction of more than 5 percent in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water. Additionally, water used for curing shall not contain an amount of impurities sufficient to discolor the grout.

**2.02 GROUT**

**A. NONSHRINK NONMETALLIC GROUT:**

1. Nonshrink grout shall be factory premixed requiring only water addition in the field. Nonmetallic aggregate grout shall be Five Star Products Inc. Five Star grout, Burke Company Non-Ferrous, Non-Shrink Grout, BASF Masterflow 928, or equal.
2. Metallic aggregate grout is not acceptable.

**B. ADHESIVE FOR DOWEL AND ANCHOR SETTING:**

1. Adhesive for setting dowels and anchoring connection/base plate bolts shall be an injectable two-component epoxy adhesive. Adhesive shall be approved for the intended use per the product ICC Report.

Adhesive shall be HIT-RE-500-SD by Hilti; SET-XP by Simpson Strong-Tie; or equal (equivalent product must have ICC approval for use in cracked concrete).

### **2.03 EPOXY INJECTION SYSTEM**

- A. Epoxy for pressure grouting/crack injection shall be a two-component, moisture insensitive, high modulus, injection grade, 100 percent solids, blend of epoxy-resin compounds. The consistency shall be as required to achieve complete penetration in hairline cracks and larger. Material shall conform to ASTM C881, Type 1, Grade 1. Candidate manufacturers include Sika Corporation Sikadur 52, BASF SCB Concessive 1300 series, and Adhesive Technology Corporation SLV 300 series, or equal.

## **PART 3 -- EXECUTION**

### **3.01 GENERAL**

- A. Holes required for grouting shall be blown clean. Horizontal holes for grouting shall be drilled at a slight downward angle to facilitate holding the grout until setting is complete. Bolts or reinforcing steel installed in horizontal grout holes shall be bent slightly accordingly. Bonding compound for use with grout is specified in the CAST-IN-PLACE CONCRETE Section (03 30 00). Mechanically mix the grout materials with or without fillers in strict accordance with the manufacturer's instruction. All application of the mixed materials shall be performed within the working life or pot life of the grout system. Unused mixed materials which have reached the end of the working or pot life shall be removed from the job site.

### **3.02 INSTALLATION**

#### **A. NONSHRINK NONMETALLIC GROUT:**

1. Nonshrink nonmetallic aggregate grout shall be used for the bearing surfaces of machinery and equipment bases, column base plates and bearing plates and for built-up surfaces.



**B. EPOXY ADHESIVE:**

1. Epoxy Adhesive shall be used for setting anchor bolts and grouting reinforcing steel holes, and setting reinforcing dowels. Concrete shall be primed in accordance with the grout manufacturer's instructions.

**C. EPOXY INJECTION SYSTEM:**

1. Epoxy injection system shall be used for repairing cracks by pressure in structural concrete. Installer shall be certified by the system supplier. Prior to starting, cracks and holes to be injected shall be washed clean. Washing is not required for grouting soil voids outside pipe cylinders or casing pipes. Injection once commenced, shall be completed without stoppage. In case of breakdown of equipment, the Contractor shall wash out the epoxy system sufficiently to ensure fresh epoxy and adequate bond and penetration will occur upon restarting the injection operation. Pressure shall be maintained until grout has set.
2. Pressure grouting equipment shall include a mixer and holdover agitator tanks and shall be designed to place grout at pressures up to 50 psi. Gages shall be provided to indicate pressure used. The mixer shall be provided with a meter capable of indicating to one-tenth of a cubic foot the volume of grout used.

**D. WEATHER LIMITATIONS:**

1. Work shall not proceed when weather conditions detrimentally affect the quality of patching or bonding concrete. Apply grout materials only when the contact surfaces are prepared and if the atmospheric temperature range and contact surfaces are suitable for the specified type of epoxy adhesive or grout material.

**E. CLEANUP:**

1. Leave finished work and work area in a neat, clean condition. Remove all spillovers onto adjacent areas to the satisfaction of the District Representative. For epoxy injection system, after the epoxy resin adhesive has cured, the epoxy resin adhesive for sealing cracks and porting devices shall be removed. Clean the substrate in a manner to produce a finish appearance acceptable to the District Representative.

**3.03 TESTING (NOT USED)**

**3.04 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***

## **SECTION 05 10 00**

### **STRUCTURAL METAL FRAMING**

#### **PART 1 -- GENERAL**

##### **1.01 DESCRIPTION**

###### **A. SCOPE:**

1. This section specifies structural metals consisting of standard shapes, fasteners, rods and plates that are used in structural framing, supports, bracing members, and connections.

###### **B. QUALITY ASSURANCE:**

1. Structural assemblies and shop and field welding shall meet the requirements of the AISC Manual of Steel Construction and the AISC Specification for Structural Steel Building.
2. The use of salvaged, reprocessed or scrap materials shall not be permitted.

###### **C. QUALIFICATIONS:**

###### **1. STAINLESS STEEL FABRICATOR:**

- a. Minimum of (10) ten years of experience in fabrication of structural stainless steel and shall be certified under AISC Quality Certification Program Category MB.
- b. Use a professional engineer on fabrication staff.

###### **2. STEEL ERECTOR:**

- a. Minimum of (10) ten years of experience in erection of structural stainless steel.
- b. With an active and enforced quality assurance program in place, as described in the Building Code.

3. Qualify welding procedures and welding operators in accordance with AWS.

## 1.02 REFERENCES

A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern, except where a specific date or edition is given below. In case of conflict between the requirements of this section and the listed standards, the requirements of this section shall prevail.

Reference	Title
CBC	California Building Code, 2010 edition
AISC 341-10	Seismic Provisions for Structural Steel Buildings Including Supplement #1
AISC 360-10	Specification for Structural Steel Building
AISC Manual	American Institute of Steel Construction, of Steel Manual of Steel Construction
ASTM A6	General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
ASTM A36	Structural Steel
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc- Coated Welded and Seamless
ASTM A193	Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service
ASTM A307	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A320	Alloy Steel Bolting Materials for Low-Temperature Service
ASTM A325	Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A490	Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
ASTM A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A563	Carbon and Alloy Steel Nuts
ASTM A992	Steel for Structural Shapes for Use in Buildings
ASTM B209	Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B241	Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
ASTM B308	Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded
ASTM F436	Standard Specification for Hardened Steel Washers
AWS B3.0	Welding Procedure and Performance Qualifications
AWS D1.1	Structural Welding Code - Steel
AWS D1.2	Structural Welding Code – Aluminum

B. DEFINITIONS: (Not Used)

**1.03 SUBMITTALS**

- A. The following submittals shall be submitted for review in accordance with the SUBMITTALS PROCEDURES Section (01 33 00):
1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
  2. Complete shop drawings, including erection plans, member and connection details, steel materials, coatings, etc. as required to fully delineate this portion of the work.
  3. Certification that steel fabricator is approved to perform steel fabrications without special inspection.
  4. Evidence that steel fabricator has AISC Certification for Steel Building Fabrication.
  5. Welder's qualification certificates stating that welders to be employed in the work have satisfactorily passed AWS qualification tests applicable to the welding to be performed on this project.
  6. Certified mill test reports for structural steel and high-strength bolts and nuts.

**PART 2 -- PRODUCTS**

**2.01 MATERIALS**

A. STAINLESS STEEL:

1. Materials for stainless steel shall be as specified in Table A.

Table A, Stainless Steel Materials

Material Specification

Plates and Structural Members	ASTM A240, Type 316L
Piping and Tubing Seamless or Welded	ASTM A358, Grade 316L
Stainless Steel Bars and Shapes	ASTM A276
Stainless steel bolts, nuts and washers	ASTM A276, A479, Type 316L

## 2.02 FABRICATION

- A. Fabrication shall be in accordance with API Standard 620.
- B. Provide as a minimum two (2) 3/4-inch-diameter, high strength bolts for all bolted connections.
- C. FABRICATION TOLERANCES:
  - 1. MEMBER LENGTH:
    - a. Both ends finished for contact bearing: 1/32 inch
    - b. Framed members 30 feet or less: 1/16 inch
    - c. Framed members over 30 feet: 1/8 inch
  - 2. MEMBER STRAIGHTNESS:
    - a. COMPRESSION MEMBERS: 1/1000 of axial length between points laterally supported.
    - b. NON-COMPRESSION MEMBERS: ASTM A6 tolerance for wide flange shapes.
  - 3. SPECIFIED MEMBER CAMBER (EXCEPT COMPRESSION MEMBERS):
    - a. 50 feet or less: +1/2 inch.
    - b. Over 50 feet: +1/2 inch (plus 1/8 inch per 10 feet over 50 feet).
    - c. Members received from mill with 75 percent of specified camber require no further cambering.
    - d. Beams/trusses without specified camber shall be fabricated so after erection, camber is upward.
    - e. Camber shall be measured in fabrication shop in unstressed condition.

## **PART 3 -- EXECUTION**

### **3.01 GENERAL**

- A. Measurements shall be verified at the job.
- B. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or drilled. No drifting of bolts nor enlargement of holes will be allowed to correct misalignment. Mismatched holes shall be corrected with new material.
- C. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators. Aluminum in contact with concrete or grout shall be protected with multiple heavy coats of bituminous paint to a minimum dry film thickness of 10 mils.
- D. Structural steel completely encased in concrete shall not be painted and shall have a clean surface for bonding to concrete. Metalwork which is bent, broken or otherwise damaged shall be repaired or replaced by the Contractor.
- E. Until all elements of the permanent structure and lateral bracing system are complete, provide temporary bracing designed, furnished, and installed by the Contractor for the partially complete structure.

### **3.02 INSTALLATION**

#### **A. WELDING:**

- 1. Welding shall be done by operators who have been qualified to perform the type of work required by tests as prescribed by AWS. Welding procedures and welding operators shall be qualified in accordance with AWS D1.1 for steel construction and AWS D1.2 for aluminum construction. Provide certifications that welders to be employed in the work have satisfactorily passed AWS qualification tests. If re-certification of welders is required, retesting will be the Contractor's responsibility.
- 2. The quality of welding shall conform to AWS Code for Arc Welding in Building Constructions, as applicable. Steel which is required to be coated for corrosion protection shall be continuously welded at all joints.
- 3. Unless otherwise specified, continuous welds shall be provided on all structural members exposed to weather or submerged in water or wastewater. Continuous seal welds shall be provided on all sides of all plates or structural shapes in contact with or submerged in water or wastewater.

**B. BOLTED CONNECTIONS:**

1. Bolted connections shall conform to AISC Framed Beam Connections, unless shown otherwise on the drawings, and shall be bearing type connections with threads excluded from shear planes. Bolts shall be fully tensioned unless connecting HSS shapes or indicated on the Drawings to be snug-tightened.

**3.03 CORROSION PROTECTION**

- A. Unless otherwise specified, all structural metal and structural steel, including that used in the fabrication of process equipment, shall be 316L Stainless Steel and shall include the following operations:
1. Grind the exterior and interior edges of all flame-cut plates or members to a smooth surface.
  2. Grind all sharp edges off of the sheared plates and punched holes.
  3. Grind uneven or rough welds with high beads to a smooth finish.

**3.04 CLEANING**

**3.05 TESTING**

- A. The District will engage inspectors to inspect welded connections and to perform tests. The inspection and tests will be paid for by the District.
- B. Ten percent of all butt and bevel welds which extend continuously for 24 inches or less shall be completely tested in accordance with AWS D1.1, Part B, Radiographic Testing of Welds, Chapter 6. All butt and bevel welds which extend continuously for more than 24 inches shall be spot tested at intervals not exceeding 36 inches.
- C. Welds that are required by the District to be corrected shall be corrected or redone and retested as directed, at the Contractor's expense and to the satisfaction of the District.
- D. The costs for all initial testing shall be paid by the District. However, the Contractor shall pay for all costs for any additional testing and inspection on work which does not meet specifications.

**3.06 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***

## SECTION 06 84 13

### FIBERGLASS REINFORCED PLASTIC FABRICATIONS

#### PART 1 -- GENERAL

##### 1.01 GENERAL

###### A. SCOPE:

1. Fiberglass reinforced plastic (FRP) fabrications including but not limited to:
  - a. Solid plate.
  - b. Railings.
  - c. Modular framing system.
  - d. Grating.
  - e. Stairs.
  - f. Ladders.
  - g. Structural members.
  - h. Supporting structure design.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)	
ANSI A14.3	Ladders - Fixed - Safety Requirements.



<u>Reference</u>	<u>Title</u>
ASTM INTERNATIONAL	
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials.
CALIFORNIA CODE OF REGULATIONS (CCR)	
Title 8	CAL/OSHA General Industry Safety Orders
Title 24, Part 2	California Building Code

**B. DEFINITIONS:**

1. Skid-resistant:
  - a. Manufacturer's standard applied abrasive grit coating.
  - b. Abrasive coated tape is not acceptable.
2. FRP: Fiberglass Reinforced Plastic.
3. GUARDRAIL: A system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level.
4. HANDRAIL: A railing provided for grasping with the hand for support.
5. RAILING: A generic term referring to guardrail, handrail and/or stair rails.
6. STAIR RAIL: A guardrail, installed at the open side of stairways with either a handrail mounted to the inside face of the guardrail, or where allowed by applicable codes, with the top rail mounted at handrail height and serving the function of a handrail.

**1.03 SUBMITTALS**

- A. The following information shall be submitted for review in accordance with SUBMITTAL PROCEDURES Section (01 33 00):
  1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.

2. Shop Drawings:
  - a. Product technical data including:
    - 1) Acknowledgement that products submitted meet requirements of standards referenced.
    - 2) Manufacturer's installation instructions.
    - 3) Manufacturer's recommendations on reinforcing field cut openings.
  - b. Fabrication and/or layout drawings.
    - 1) Plan showing dimensions, profile, location, section and details of each item including anchorage or support system(s).
    - 2) Locations and type of expansion joints.
    - 3) Materials of construction including shop applied coatings.
    - 4) Listing of all accessory items being provided indicating material, finish, etc.
  - c. Certifications:
    - 1) Certification of Structural Engineer's qualifications.
    - 2) Certification that all components and systems have been designed and fabricated to meet the loading requirements specified.
    - 3) Certification that all components are suitable for the specified chemical services, and no degradation within the warranty period.
  - d. Manufacturer's full line of colors available for each component.
3. Miscellaneous Submittals:
  - a. Complete design calculations of all supporting structure and fastening conditions.
    - 1) Design calculations to be for information only. All fiberglass reinforced plastic support systems shall be designed by a registered professional structural engineer licensed in the State of California.

#### **1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and handle each item to preclude damage.
- B. Store all items on skids above ground.
  - 1. Keep free of dirt and other foreign matter which will damage items or finish and protect from corrosion and UV exposure.

### **PART 2 -- PRODUCTS**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  - 1. AICKIN.
  - 2. American Grating.
  - 3. Enduro Composite Systems.
  - 4. Fibergrate Composite Structures, Inc.
  - 5. IKG Industries.
  - 6. International Grating Inc.
  - 7. Seasafe, Inc.
  - 8. Strongwell.
  - 9. Or equal.

#### **2.02 MATERIALS**

- A. FIBERGLASS REINFORCED PLASTIC (FRP):
  - 1. Vinyl ester with fiberglass reinforcing.
    - a. Type V.
  - 2. Polyester resin with fiberglass reinforcing.
    - a. Type I.

3. Resin type shall be selected by manufacturer to meet requirements of chemical resistance specified.
  4. Fire retardant.
    - a. Flame spread: ASTM E84, 25 or less.
  5. COLOR: To be selected by the District when more than one (1) color is available for any one (1) component.
- B. FASTENERS, CLIPS, SADDLES, AND MISCELLANEOUS COMPONENTS:
1. Fiberglass where possible.
  2. 316 Stainless steel may be used if fiberglass component is not available.
- C. ADHESIVE: Recommended by manufacturer.
- D. SKID-RESISTANT SURFACING: Manufacturer-applied abrasive grit coating.

### **2.03 FABRICATION**

- A. GENERAL:
1. Verify field conditions and dimensions prior to fabrication.
  2. Chemical resistance:
    - a. System shall be capable of withstanding occasional contact with the following chemicals:
      - 1) 50 percent sulfuric at 70 Deg. F.
  3. Preassemble items in shop to greatest extent possible.
  4. All components shall be treated with UV inhibitor.
  5. Drill or punch holes with smooth edges.

**B. RAILINGS:**

1. Custom fabricate handrail and guardrail to profiles and dimensions indicated on Drawings.
2. Where not indicated on Drawings, design railings to resist loading as required by the California Building Code, CCR Title 24, Part 2 and CCR, Title 8, CAL/OSHA General Industry Safety Orders.
3. Minimum 2-inches square by 0.187-inch tube.
4. Kickplate:
  - a. 4 x ½-inch (corrugated) by 0.125-inch thick.
  - b. Provide at all elevated platforms and where required by CCR, Title 8.
5. HANDRAILS: provide handrail supports at 4-feet maximum spacing for wall brackets and 4-feet maximum spacing for posts.
  - a. Provide vertical supports at 4-feet maximum spacing on all inclined rail sections.
  - b. Provide brackets which provide a 1 ½-inch projection from finish wall surface or guardrail to wall or guardrail side of rail.
  - c. Handrails shall not project more than 4 ½-inch into required stairway width.
6. GUARDRAILS: Fit exposed ends of guardrails and handrails with solid terminations.
  - a. Return ends of handrail to wall but do not attach end to wall.
  - b. Where guardrail terminates at a wall or other obstruction, provide a vertical support post located 4-inch off wall or obstruction to center of post.
7. Form connections with flush, smooth, hairline joints.
  - a. Provide concealed splice fitting at all connections.
  - b. Top rail splices and expansion joints shall be located within 8-inch of support.
8. Fabricate items free of blemishes, seam marks, roller marks, rolled trade names and roughness.

9. Provide removable railing where indicated.
10. Provide weeps to drain moisture from hollow railing sections at exterior and in high humidity areas.
  - a. 1/4-inch weep hole in railing 1-inch above walkway surface at bottom of posts set in concrete or otherwise closed at bottom, and at other low points where moisture can collect.

C. GRATING AND SOLID PLATE MATERIAL:

1. Design live load:
  - a. 100 psf uniform live load.
  - b. 300 LBS concentrated load.
  - c. Maximum deflection of 1/300 of span under a superimposed live load.
  - d. Design for the most severe loading condition noted above.
2. Minimum grating depth: 1 1/2-inch.
3. BAR SPAN: Maximum of 1 1/2-inch center to center.
4. WALKING SURFACE: Manufacturer's standard applied abrasive grit coating.
5. Bearing bars and cross-bars to be fabricated at the same time creating a one-piece type construction.
6. SOLID PLATE: Minimum 1/8-inch thick molded FRP sheet with skid-resistant abrasive grit surface.

D. EMBEDDED GRATING SUPPORTS:

1. Fiberglass.
2. Size to suit depth of grating.
3. Provide leg or strap for embedding and anchoring into concrete.
4. Similar to Strongwell "Duradek Fiberglass Curb Angle."

E. STAIRS:

1. Fabricated to profiles indicated and complying with CCR Title 24, Part 2 California Building Code, and CCR, Title 8, CAL/OSHA General Industry Safety Orders.
2. TREADS: Grating with integral 1-inch skid-resistant nosing.
  - a. Provide center reinforcing for treads over 36-inches wide.
3. Risers:
  - a. Solid plate material.
  - b. Provide center vertical reinforcing for risers over 36-inches wide.
4. Landings:
  - a. Grating with manufacturer's standard applied skid-resistant abrasive grit coating.
    - 1) Provide skid-resistant nosing on leading edge of stairs.
  - b. Provide intermediate support as required to meet loading requirements.
5. Design and fabricate stair, platforms and landings, and all connections to support a 100 psf uniform live load plus a 300 psf concentrated load.
6. Provide railing per this Specification Section.

F. LADDERS:

1. Design in accordance with ANSI A14.3 and CCR Title 8, CAL/OSHA General Industry Safety Orders requirements unless noted otherwise below.
2. Ladders shall be designed to support a minimum 300 pounds concentrated vertical load with 150 pounds concentrated horizontal load without failure or permanent set.
  - a. Maximum lateral deflection: Side rail span/300.
3. Rungs:
  - a. 1 IN square or diameter solid bar with skid-resistant surface on all sides.
  - b. Uniform maximum spacing of 12-inches.
  - c. Top rung level with top of platform.
  - d. Rungs shall not extend beyond the outside face of the ladder side rail.

4. Rails:
  - a. 2-inch square tube, minimum 0.156-inch thick.
  - b. Provide minimum 1/2 by 2 1/2-inch length required standoff brackets on each side rail with punched holes for 3/4-inch anchors.
    - 1) Maximum vertical spacing: 5-feet on center.
  - c. The side rails of through ladder extensions shall extend 42-inches above the top rung or landing and shall flare out on each side to provide a clearance of 24-inches between the rails.
5. Minimum distance from centerline of rungs to wall or obstruction shall be 7 inches.
6. Ladder fall protection systems per CCR Title 8, CAL/OSHA General Industry Safety Orders requirements.
7. Ladder safety extension post per CCR Title 8, CAL/OSHA General Industry Safety Orders requirements.

**G. MODULAR FRAMING SYSTEM:**

1. MATERIAL: Heavy duty pultruded.
2. Shapes as required for condition.
3. FASTENERS: Stainless steel or fiberglass.
4. Provide end caps for all exposed terminations.

**H. STRUCTURAL MEMBERS:**

1. Provide structural members having the same resin composition as the item being supported.
2. Factory fabricate with all required connection holes and holes for work of other trades.

**PART 3 -- EXECUTION**

**3.01 GENERAL (NOT USED)**

**3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.



B. Set work accurately in location, alignment and elevation, plumb, level, and true.

1. Measure from established lines and levels.
2. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
3. Tolerances:
  - a. Maximum variation from plumb in vertical line: 1/8-inch in 3-feet.
  - b. Maximum variation from level of horizontal line: 1/4-inch in 20-feet.
  - c. Maximum variation from plan location: 1/4-inch in 20-feet.

C. RAILINGS:

1. Adjust railings prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length.
  - a. Plumb posts in each direction.
2. Provide posts with floor flange, attached to post and with predrilled holes for bolting to stringer, floor or beam.
3. Anchor handrails to walls or guardrails with brackets designed for condition.
  - a. For concrete and solid masonry anchorage, use stainless steel anchors with stainless steel bolts with hex nuts.
  - b. Anchor size and embedment to be designed by component fabricator.
    - 1) Provide minimum of 1/2-inch anchor bolts.

D. Coat all exposed surfaces of stainless steel fasteners with minimum 15 mil gel coating to match component being anchored.

E. Fasten railings to beams and stair stringers with stainless steel bolts, nuts and washers.

1. Provide two (2) washers for each bolt.

- F. Attach grating to each end and intermediate support clip or saddle with bolts, nuts and washers.
  - 1. Maximum spacing: 2-feet on center with minimum of two (2) per side.
  - 2. Attach clips or saddles to bearing bars only.
  - 3. Reinforce all field cut openings in accordance with manufacturer's recommendations.
- G. Attach stair treads at ends to stair stringer with hold-down clips, bolts, nuts, and washers.
  - 1. Minimum two (2) clips per end.
- H. File cut ends of all fiberglass to a 1/32-inch radius.
- I. Seal cut ends of all items with catalyzed resin as recommended by manufacturer.
  - 1. Provide same resin used in fabrication of item as a minimum.
- J. Provide all modular framing components as required to suit condition.
  - 1. Install in accordance with manufacturer's recommendations.

**3.03 TESTING (NOT USED)**

**3.04 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***

## SECTION 07 92 00

### JOINT SEALANTS

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. Sealant work.

###### B. Work included consists of but is not necessarily limited to:

1. Sealing all joints which will permit penetration of dust, air or moisture, unless sealing work is specifically required under other Specification Sections.

###### a. Work includes but is not limited to:

1) Isolation joints.

2) Concrete construction, control and expansion joints.

3) Other joints where sealant, expanding foam sealant or compressible sealant is indicated.

##### 1.02 REFERENCES

A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
AMERICAN CONCRETE INSTITUTE (ACI)	
ACI 302.1R	Guide for Concrete Floor and Slab Construction
ASTM INTERNATIONAL (ASTM):	
ASTM C834	Standard Specification for Latex Sealants
ASTM C919	Standard Practice for Use of Sealants in Acoustical Applications
ASTM C920	Standard Specification for Elastomeric Joint Sealants

<u>Reference</u>	<u>Title</u>
ASTM C1521	Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E90	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

UNDERWRITERS LABORATORIES, INC. (UL)

B. DEFINITIONS: (Not Used)

### 1.03 SUBMITTALS

A. The following information shall be submitted for review in accordance with SUBMITTAL PROCEDURES Section (01 30 00):

1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
2. Shop Drawings:
  - a. See Specification for requirements for the mechanics and administration of the submittal process.
  - b. Product technical data including:
    - 1) Acknowledgement that products submitted meet requirements of standards referenced.
    - 2) Manufacturer's installation instructions.
    - 3) Manufacturer's recommendations for joint cleaner, primer, backer rod, tooling and bond breaker.
  - c. Certification from sealant manufacturer stating product being used is recommended for and is best suited for joint in which it is being applied.
  - d. Certification of applicator qualification.
3. Samples:
  - a. Cured sample of each color for District's color selection.

## **1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

## **1.05 QUALITY ASSURANCE**

- A. Qualifications: Sealant applicator shall have minimum five (5) years experience using products specified on projects with similar scope.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver material in manufacturer's original unopened containers with labels intact: Labels shall indicate contents and expiration date on material.

## **PART 2 -- PRODUCTS**

### **2.01 MATERIALS**

#### **A. SEALANTS - GENERAL:**

1. Where compound is not exposed to view in finished work, provide manufacturer's color which has best performance.
2. Nonsagging sealant for vertical and overhead horizontal joints.
3. Sealants for horizontal joints: Self-leveling pedestrian/traffic grade.
4. Joint cleaner, primer, bond breaker: As recommended by sealant manufacturer.

5. Sealant backer rod and/or compressible filler:

a. Closed cell polyethylene, polyethylene jacketed polyurethane foam, or other flexible, nonabsorbent, non-bituminous material recommended by sealant manufacturer to:

- 1) Control joint depth.
- 2) Break bond of sealant at bottom of joint.
- 3) Provide proper shape of sealant bead.
- 4) Serve as expansion joint filler.

B. ACOUSTICAL SEALANT (NOT USED)

C. COMPRESSIBLE SEALANT (NOT USED)

D. POLYETHER SEALANT (NOT USED)

E. POLYSULFIDE RUBBER SEALANT (NOT USED)

F. POLYUREA JOINT FILLER (NOT USED)

G. POLYURETHANE SEALANT:

1. One (1) or two (2) components, paintable.
2. ASTM C920 Type S or Type M, Grade NS or P, Class 25, Use NT, T, M, A and O.
3. Acceptable Products:
  - a. Pecora Dynatrol-IXL, Dynatrol II, Urexpan NR-200, NR-201.
  - b. Sika Chemical Corporation Sikaflex-1a, Sikaflex-2C NS/SL.
  - c. BASF Sonneborn Sonolastic NP-1, NP-II, SL-1 SL-2.
  - d. Tremco Dymonic or Dymeric, Vulkem 116,227,45,245.

H. SILICONE SEALANT (NOT USED)

## **PART 3 -- EXECUTION**

### **3.01 GENERAL (NOT USED)**

### **3.02 INSTALLATION**

#### **A. PREPARATION:**

1. Before use of any sealant, investigate its compatibility with joint surfaces, fillers and other materials in joint system.
2. Use only compatible materials.
3. Where required by manufacturer, prime joint surfaces.
  - a. Limit application to surfaces to receive sealant.
  - b. Mask off adjacent surfaces.
4. Provide joint depth for joints receiving polyurea joint filler in accordance with manufacturer's recommendations.

#### **B. INSTALLATION:**

1. Install products in accordance with manufacturer's instructions and UL requirements.
2. Clean all joints.
3. Make all joints water and airtight.
4. Make depth of sealing compounds, except expanding foam and polyurea sealant, not more than one-half width of joint, but in no case less than ¼-inch nor more than ½-inch unless recommended otherwise by the manufacturer.
5. Provide correctly sized backer rod, compressible filler or **compressible sealant** in all joints to depth recommended by manufacturer:
  - a. Take care to not puncture backer rod and compressible filler.
  - b. **Provide joint backer rod as recommended by the manufacturer for polyurea joint filler.**
6. Apply 1" wide bond breaker tape over the steel-to-concrete joint prior to polyurethane joint sealant.
7. Tool sealants using sufficient pressure to fill all voids.

8. Upon completion, leave sealant with smooth, even, neat finish.
9. Where piping, conduit, ductwork, etc., penetrate wall, seal each side of wall opening.

### **3.03 TESTING**

#### **A. FIELD QUALITY CONTROL:**

1. Adhesion Testing:
  - a. Perform adhesion tests in accordance with ASTM C1521 per the following criteria:
    - 1) Water bearing structures: One (1) test per every 1000 LF of joint sealed.
    - 2) Exterior precast concrete wall panels: One (1) test per every 2000 LF of joint sealed.
    - 3) Chemical containment areas: One (1) test per every 1000 LF of joint sealed.
    - 4) Building expansion joints: One (1) test per every 500 LF of joint sealed.
    - 5) All other type of joints except butt glazing joints: One (1) test per every 3000 LF of joint sealed.
    - 6) Manufacturer's authorized factory representative shall recommend, in writing, remedial measures for all failing tests.

### **3.04 TRAINING (NOT USED)**

### **3.05 SCHEDULE**

- A. Furnish sealant as indicated for the following areas:
  1. Exterior areas:
    - a. Above grade: Polyurethane.
    - b. Below grade: Polyurethane.
  2. Interior areas:
    - a. Noncorrosive areas:
      - 1) Wet exposure: Polyurethane.



Toilet rooms, locker rooms, janitor closets or similar areas: Mildew resistant silicone.

- 2) Dry exposure: Polyether [Polyurethane] [Silicone], unless noted otherwise.
  - a. Sound insulated construction: Acoustical sealant.
- b. Corrosive areas:
  - 1) Wet exposure: Polysulfide [Polyurethane].
  - 2) Dry exposure: Polyurethane [Silicone].
- c. Sealant exposed to or having the potential of being exposed to concentrated chlorine gas or chlorine liquid: Polysulfide.

- d. Casework, countertops and solid surface materials: Silicone.
  - 1) Sinks, fixtures or other areas subject to potential splash, spillage or condensation: Mildew Resistant Silicone.
- 3. Immersion:
  - a. Prolonged contact with or immersion in:
    - 1) Potable water:
      - a. Polysulfide.
    - 2) Nonpotable water, wastewater or sewage: Polysulfide.
- 4. Compressible sealant: Where indicated.
- 5. Exterior wall penetrations:
  - a. Finish sealant:
    - 1) Exterior side:
      - a. Above grade: Polyether.

Below grade: Polyurethane.
    - 2) Interior side:
      - a. Noncorrosive area:
        - Wet exposure: Polyether [Polyurethane] [Silicone].
        - Dry exposure: Polyether [Polyurethane] [Silicone], unless noted otherwise.
      - b. Corrosive area:
        - Wet exposure: Polysulfide [Polyurethane].
        - Dry exposure: Polyurethane [Silicone].
- 6. Interior concrete slab formed or saw-cut control joints: Polyurea joint filler.

**\*\*END OF SECTION\*\***

## SECTION 40 05 03

### COMMON WORK RESULTS FOR PIPING SYSTEMS

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. This section specifies systems of process piping and general requirements for piping systems in all project applications.
2. Detailed information for piping systems are contained in the Piping Specification Sheets (PIPESPEC) located at the end of this specification section.
3. Additional detailed specifications for the components listed on the Piping System Specification sheets are found in other project specification sections. This section shall be used in conjunction with those sections.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
ANSI A13.1	Scheme for the Identification of Piping Systems
ASTM A36	Carbon Structural Steel
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A240	Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
ASTM A312	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A536	Ductile Iron Castings
ASTM A778	Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products
ASTM B88	Standard Specification for Seamless Copper Water Tube

<u>Reference</u>	<u>Title</u>
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM D1785	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2000	Standard Classification System for Rubber Products in Automotive Applications
ASTM D3034	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3035	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM F104	Standard Classification System for Nonmetallic Gasket Materials
AWWA C111	AWWA C111-12 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151	Ductile-Iron Pipe, Centrifugally Cast
AWWA C200	Steel Water Pipe 6 Inch (150 Mm) and Larger
AWWA C651	Disinfecting Water Mains
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution
AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings 4 In. (100 mm) Through 63 In. (1,600 mm) for Water Distribution and Transmission
CISPI 301	Standard Specification for Hubless Cast Iron Soil Pipe and Fittings
CISPI 310	Specification for Coupling For Use in Connection With Hubless Cast Iron Soil Pipe and Fittings
CPC	California Plumbing Code
NSF-61	National Sanitation Foundation, Drinking Water System Components – Health Effects
UPC	Uniform Plumbing Code

## B. DEFINITIONS:

1. PIPESPEC: Piping system detail information located at the end of this specification section.
2. Pressure terms used in these project specifications are defined as follows:
  - a. MAXIMUM: The greatest continuous pressure at which the piping system operates.
  - b. TEST: The hydrostatic pressure used to determine system acceptance.
3. Exposure location terms used in these specifications are defined as follows:
  - a. INTERIOR: Inside of a building or structure.
  - b. EXTERIOR: Outside of a building or structure and exposed to weather elements.
  - c. BURIED: Below grade and in contact with backfill material or concrete encasement. Piping may or may not be insulated.
  - d. SUBMERGED: Submerged or below the top elevation of structures or facilities containing liquids, such as: tanks, channels, digesters, manholes, sumps, basins, rivers, and other areas as indicated or shown on the drawings.
4. Exposure severity terms are defined as follows:
  - a. MILD ENVIRONMENT: Standard commercial facility conditions.
  - b. MODERATE ENVIRONMENT: Industrial facility conditions where surfaces may be occasionally exposed to light-moderately aggressive liquids, solids or gases.
  - c. HARSH ENVIRONMENT: Industrial facility conditions where surfaces may be subject to aggressive liquids, solids or gases, or surfaces may be normally exposed to light-moderately aggressive liquids, solids or gases.

## 1.03 SUBMITTALS

- A. The following information shall be submitted for review in accordance with the SUBMITTAL PROCEDURES Section (01 33 00):
  1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
  2. Information on piping materials as specified in individual specification sections for piping materials, flanges, fittings, gaskets, valves, supports and components. Include manufacturer's data, ASTM conformance, and catalog numbers.

3. Piping layout and support shop drawings for all piping systems including all pipes, drains, vents, valves, supports, seismic braces, and specific locations of all instrument taps. Drawings shall be original layouts by the Contractor photocopies of contract drawings are not acceptable.
4. Sample of the valve identification tag.

#### **1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

### **PART 2 -- PRODUCTS**

#### **2.01 PIPING MATERIALS**

##### **A. GENERAL:**

1. Piping materials including pipe, gaskets, fittings, connections, and joint assemblies, lining and coatings, shall be provided from those listed on the Piping System Specification sheets associated with this section and as shown on the drawings.
2. Piping materials shall conform to detailed specifications for each type of pipe and piping appurtenances specified in other project specification sections.
3. Pipe connection types shall also be provided as listed in the project specifications and where shown on the drawings.
4. To assure uniformity and compatibility of piping components, fittings and couplings for grooved end piping systems shall be furnished by the same manufacturer.

## B. FLANGE GASKETS:

### 1. GENERAL:

- a. Flange gaskets shall be of the full-face type. Gasket thickness shall be as specified, unless otherwise shown on the drawings.
- b. For flanged connections on polyethylene pipe installations, full-face gaskets shall be installed, and shall be manufactured with an internal diameter equal to the pipe internal diameter and an outer diameter equal to the larger of the polyethylene flange adapters or the joining appurtenance flange.

### 2. COMPRESSED NON-ASBESTOS-NITRILE:

- a. ACCEPTABLE PRODUCTS: Garlock BLUE-GARD Style 3000, or equal.
- b. MATERIAL: ASTM F104 Compressed non-asbestos sheet gasket with Aramid fibers and nitrile binder. Continuous temperature limit = 400 °F (not for saturated steam). Pressure limit = 1,000 psi. Thickness = 0.062 inches.

### 3. EPDM:

- a. ACCEPTABLE PRODUCTS: Garlock Style 8314; Biltrite Style 475; or equal.
- b. MATERIAL: Premium-grade ASTM D2000 EPDM rubber sheet gasket. Durometer Shore A hardness = 60. Temperature limit = 300 °F. Pressure limit = 150 psi. Thickness = 0.125 inches.

### 4. EPDM RING:

- a. ACCEPTABLE PRODUCTS: ASAHI/America Style AV; Garlock Stress Saver 6800; Proco style 9013-EP, or equal.
- b. MATERIAL: Premium-grade ASTM D2000 EPDM rubber molded ring gasket. Durometer Shore A hardness = 60. Temperature range = -4 to +210 °F. Pressure limit = 150 psi

### 5. FILLED PTFE:

- a. ACCEPTABLE PRODUCTS: Garlock Blue GYLON Style 3504, or equal.
- b. MATERIAL: ASTM F104 filled PTFE gasket. Temperature range = -350 to +500 °F. Pressure limit = 800 psi. Thickness = 0.062 inches.

### 6. FILLED PTFE OXY:

- a. ACCEPTABLE PRODUCTS: Durabla Durlon 9000; Garlock Fawn GYLON Style 3502 for oxygen service, or equal.



- b. MATERIAL: ASTM F104 filled PTFE gasket for oxygen service. Temperature range = -350 to +500 °F. Pressure limit = 1200 psi. Thickness = 0.062 inches.
7. NEOPRENE:
- a. ACCEPTABLE PRODUCTS: Garlock Style 7986, or equal.
  - b. MATERIAL: Premium-grade ASTM D2000 neoprene rubber sheet gasket. Durometer Shore A hardness = 70. Temperature limit = 250 °F.
8. NEOPRENE CI (CLOTH INSERT):
- a. ACCEPTABLE PRODUCTS: Garlock Style 3205; Biltrite Cloth-Inserted Neoprene – Regular Polyester Ply; or equal.
  - b. MATERIAL: Reinforced rubber diaphragm gasket. Premium-grade ASTM D2000 neoprene rubber sheet gasket with polyester fabric insert. Durometer Shore A hardness = 70. Temperature limit = 200 °F. Thickness = 0.125 inches.
9. NITRILE:
- a. ACCEPTABLE PRODUCTS: Garlock Style 9122; Biltrite Premium Nitrile; or equal.
  - b. MATERIAL: Premium-grade ASTM D2000 nitrile (Buna N) rubber sheet gasket. Durometer Shore A hardness = 70. Temperature limit = 250 °F. Pressure limit = 150 psi. Thickness = 0.125 inches.
10. PTFE BONDED:
- a. ACCEPTABLE PRODUCTS: ASAHI/America Style AV; Garlock Style Stress Saver 370; Proco Style 9013-ET, or equal.
  - b. MATERIAL: PTFE envelope gasket with concentric, convex molded rings bonded to an EPDM core. EPDM Durometer Shore A hardness = 65. Temperature range = -4 to +210 °F.
11. PTFE ENVELOPE:
- a. ACCEPTABLE PRODUCTS: Flexitallic, or equal.
  - b. MATERIAL: PTFE split type envelope gasket with neoprene cloth-insert gasket core. Temperature range = -350 to +480 °F. Core thickness = 0.125 inches.

## C. COUPLING GASKETS:

### 1. GENERAL:

- a. Gaskets for sleeve-type, plain end, and grooved end couplings shall be provided by the coupling manufacturer.

### 2. EPDM:

- a. EPDM rubber.
- b. Temperature range = -30 to +230 °F.
- c. NSF-61 certified for potable water service.

### 3. NEOPRENE:

- a. Neoprene rubber.
- b. Temperature range = +30 to +180 °F.

### 4. NITRILE:

- a. Nitrile (Buna N) rubber.
- b. Temperature range = -20 to +180 °F.

### 5. FLUOROELASTOMER:

- a. Fluoroelastomer (Viton).
- b. Temperature range = +20 to 300 °F.

## D. SLEEVE-TYPE COUPLINGS:

### 1. ACCEPTABLE PRODUCTS

- a. ACCEPTABLE PRODUCTS: PowerSeal, Romac Industries, Smith-Blair, or equal, modified as required to meet the specifications in accordance with the tables below. Sleeve-type couplings shall only be used on pipe types that are compatible per manufacturer's requirements with the acceptable products in the tables below.

<b>Acceptable Products for Ductile Iron Sleeve-Type Couplings</b>			
Description	PowerSeal Allowable Sizes	Romac Industries Allowable Sizes	Smith-Blair Allowable Sizes
Standard	3501 2 to 48 inches	501 2 to 24 inches	441 2 to 16 inches
Extended Range	3506 2 to 16 inches	XR501 4 to 12 inches	461 1.5 to 12 inches
Reducing	3506R 4 to 12 inches	RC501 3 to 24 inches	R441 2 to 8 inches
Flanged adapter	3521 4 to 12 inches	FCA501 3 to 16 inches	912 3 to 12 inches
Insulating	N/A	IC501 4 to 14 inches	N/A

<b>Acceptable Products for Steel Sleeve-Type Couplings</b>			
Description	PowerSeal Allowable Sizes	Romac Industries Allowable Sizes	Smith-Blair Allowable Sizes
Standard	3538 14 to 72+ inches	400 14 to 96+ inches	411 standard weight design 14 to 200 inches
Extended Range	N/A	N/A	N/A
Reducing	3562R 14 to 48+ inches	RC400 26 to 96+ inches	413 or 415 26 to 48+ inches
Flanged adapter	3528 14 to 24+ inches	FC400 14 to 96+ inches	913 14 to 24 inches
Insulating	3539 14 to 24+ inches	IC400 16 to 48+ inches	416 16 to 24 inches

<b>Acceptable Products for Stainless Steel Sleeve-Type Couplings</b>			
Description	PowerSeal Allowable Sizes	Romac Industries Allowable Sizes	Smith-Blair Allowable Sizes
Standard	3506AS 2 to 12 inches 3538 12 inches and up	400 12 to 96+ inches	N/A
Extended Range	3506AS 2 to 12 inches	N/A	N/A
Reducing	3562 12 inches and up	RC400 26 to 96+ inches	N/A
Flanged adapter	N/A	N/A	N/A
Insulating	N/A	N/A	N/A

2. MATERIAL:

- a. Materials for Ductile Iron, Steel and Stainless Steel sleeve-type couplings shall be in accordance with the following tables:

<b>Materials for Ductile Iron Sleeve-Type Couplings</b>				
<b>Acceptable Exposure Severity: Mild &amp; Moderate</b>				
<b>Exposure Locations</b>				
	Interior	Exterior	Buried	Submerged
Center Body	ASTM A536 ductile iron	ASTM A536 ductile iron	ASTM A536 ductile iron	ASTM A536 ductile iron
End Glands	ASTM A536 ductile iron	ASTM A536 ductile iron	ASTM A536 ductile iron	ASTM A536 ductile iron
Gasket	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets
Bolts and Nuts	High strength, low alloy steel	High strength, low alloy steel	High strength, low alloy steel	Type 316 Stainless Steel
Finish	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy

<b>Materials for Steel Sleeve-Type Couplings</b>				
<b>Acceptable Exposure Severity: Mild &amp; Moderate</b>				
<b>Exposure Locations</b>				
	Interior	Exterior	Buried	Submerged
Center Body	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
End Glands	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Gasket	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets
Bolts and Nuts	High strength, low alloy steel	High strength, low alloy steel	High strength, low alloy steel	Type 316 Stainless Steel
Finish	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy	AWWA C213 Fusion Bonded Epoxy

<b>Materials for Stainless Steel Sleeve-Type Couplings</b>				
<b>Acceptable Exposure Severity: Mild &amp; Moderate &amp; Harsh</b>				
<b>Exposure Locations</b>				
	Interior	Exterior	Buried	Submerged
Center Body	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel
End Glands	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel	ASTM A240 Type 316 stainless steel
Gasket	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets	Per PIPESPEC sheets
Bolts and Nuts	Type 316 stainless steel	Type 316 stainless steel	Type 316 stainless steel	Type 316 stainless steel
Finish	N/A	N/A	N/A	N/A

3. RING STIFFENERS:

- a. Ring Stiffeners required for use of restrained sleeve couplings on HDPE pipe.
  - 1) ACCEPTABLE PRODUCTS: JCM 230 and 231 or equal.
  - 2) MATERIAL: ASTM 240 – TP 304 Stainless Steel or 316 Stainless Steel

**2.02 PIPING IDENTIFICATION**

A. PIPE LABELING:

1. ACCEPTABLE PRODUCTS:

- a. ADHESIVE LABELS: Brady B-681 polyester with overlamine; Craftmark model Duramark HT polyester with overlamine; or equal, modified as required to meet the specifications.
- b. SELF-COILING LABELS: Brady model B-915 Snap-On & Strap-On; Craftmark model Specmark Snap-On; or equal, modified as required to meet the specifications.

2. Labels for identifying piping shall conform to ANSI A13.1. Piping labels shall include system, contents, and direction of flow. Labels shall be provided bearing the label lettering on the background colors specified in Table A. Color field shall be long enough to print the entire lettering

3. Size of legend letters and minimum length of color field:

Outside Diameter of Pipe or Covering (inches)	Minimum Length of Color Field (inches)	Letter Height (inches)
¾ to 1¼	8	½
1½ to 2	8	¾
2½ to 6	12	1¼
8 to 10	24	2½
Over 10	32	3½

4. LABEL CONSTRUCTION:

- a. Adhesive labels shall be weather, water, and grease-resistant, with 5 to 8 year average outdoor life. Labels shall be polyester with polyester overlamine. Vinyl labels are not acceptable.
- b. Self-coiling, around-pipe markers shall be weather, water, and grease-resistant, with 5 to 8 year average outdoor life.

- c. In the event of a short piping run and none of the above methods will be practical, a metal tag fastened with stainless steel wire may be used to identify the piping system.

**B. PIPE COLOR:**

1. Piping shall be painted in accordance with the attached PIPESPECS and the PAINTING AND COATING Section (09 90 00). Stainless steel pipes are typically not painted. The following are general SRWTP reserved piping paint colors:
  - a. ORANGE: Chlorine
  - b. YELLOW: Sulfur dioxide
  - c. BONE WHITE: All chemical piping other than chlorine and sulfur dioxide
  - d. RED: Fire suppression
  - e. LIGHT GRAY: All piping other than chemical and fire suppression

**C. VALVE LABELS AND TAGS:**

1. Labeling or tagging of valves and other fixtures shall use the method that is both durable and readily viewable.
2. Approved tagging media are as follows:
  - a. METAL TAGS:
    - 1) 16-gauge aluminum or 0.025 inch Type 304 stainless steel construction
    - 2) Minimum 1-inch by 4-inch rectangular in size with rounded corners
    - 3) ½-inch high letters, deeply and legibly engraved or stamped
    - 4) Attached with 16-gauge 304 stainless steel wire
  - b. MULTI-LAYER PLASTIC TAGS:
    - 1) UV stabilized
    - 2) At least 2-ply impact acrylic
    - 3) At least 1/16-inch thick
    - 4) Minimum 1-inch by 4-inch rectangular in size

- 5) ½-inch high letters, deeply and legibly engraved
- 6) Attached with 16-gauge 304 stainless steel wire

## **2.03 PIPING APPURTENANCES**

### **A. WATER STRAINERS:**

#### **1. ACCEPTABLE PRODUCTS:**

- a. Watts; Mueller Steam Specialty; or equal.

#### **2. MATERIAL:**

- a. BODY: Bronze or cast iron. Y-pattern, unless otherwise specified.
- b. SCREENS: 0.045-inch 304 stainless steel,

## **PART 3 -- EXECUTION**

### **3.01 GENERAL - NOT USED**

### **3.02 INSTALLATION**

#### **A. LOCATION:**

1. Piping shall be installed as shown on the drawings, except for adjustments to accommodate conflicts. A minimum vertical clearance of 8 feet shall be provided over walkways and throughways in all tunnels and galleries. Unless otherwise indicated on the drawings, minimum depth of cover for buried, non-plastic pipe shall be 42 inches over the top of the pipe. Unless otherwise indicated on the drawings, minimum depth of cover for buried, plastic pipe shall be 48 inches over the top of the pipe.

#### **B. PIPE SUPPORT, ANCHORAGE AND SEISMIC BRACING:**

1. Piping shall be supported, anchored, and seismically braced as shown on the drawings and as specified in the HANGERS AND SUPPORTS FOR PROCESS PIPING Section (40 05 07).
2. Where a specific type of support or anchorage is indicated on the layout drawings, then only that type shall be used there.
3. Supports shall be provided on each run at each change of direction.
4. Unless otherwise shown on the drawings, existing pipes and supports shall not be used to support new piping.

C. RESTRAINTS FOR PIPING:

1. All pipe-to-pipe joints, plugs, caps, tees, bends, and valves shall be restrained for all exposed and buried piping unless otherwise specified. Restrained pipe-to-pipe joints, shall be flanged or grooved end for exposed service and restrained push-on for buried service or as specified in the individual piping sections.
2. Concrete thrust blocks shall be as shown on the drawings.

D. PROCESS INSTRUMENTATION CONNECTIONS:

1. Process instrumentation taps shall be as shown on the detail drawings. Taps shall be located, sized and orientation coordinated with the requirements of the INSTRUMENTATION OF PROCESS SYSTEMS Section (40 70 00) and the SCHEDULE FOR INSTRUMENTATION OF PROCESS SYSTEMS Section (40 06 70.)
2. Direct drill and tap of a pipe wall is not acceptable.

E. DRAINS AND VENTS:

1. Provide manual air vents in the following locations:
  - a. Where indicated on plans
  - b. At all high points of piping, including high points created at all piping offsets
  - c. On horizontal piping in excess of twenty feet from any offset or riser
  - d. On horizontal piping shall be installed at a maximum interval of 100 foot
2. AIR VENTS:
  - a. Air vents shall be piped to the floor with a valve within 4 feet of the floor
  - b. For solid-containing fluids, manual air vents shall include 1-inch valve and a cam and groove quick disconnect fitting
  - c. All other manual air vents shall be a ¾-inch valve
3. Provide drains in the following locations:
  - a. Where indicated on plans
  - b. At all low points of piping, including piping offsets and drops
  - c. On horizontal piping in excess of twenty feet from any offset or drop



d. On horizontal piping at a maximum of one hundred foot intervals

4. DRAINS:

a. Drains shall be piped to a floor drain, sump or gutter with a valve within 4 feet of the floor

- b. Drains for solid-containing fluids shall include a 2-inch valve and a cam and groove quick disconnect fitting
  - c. All other drains shall incorporate a 1-inch valve
5. When air vents and drains cannot be piped to the locations listed above the Contractor shall notify the District Representative who will determine an acceptable alternate method or location.

### **3.03 PIPING IDENTIFICATION**

#### **A. PIPE LABELS:**

- 1. After application of the specified coating and insulation systems, non-buried piping shall be identified with labels. Labels shall be neat, readable and uniform in appearance. Labels shall be readily visible from normal working locations and must not impede normal operations.
- 2. Labels shall not be located where they will be damaged by normal use or tools.
- 3. Each exposed pipe will be identified:
  - a. At intervals of 40 feet on straight pipe runs greater than 120 feet, otherwise
  - b. At intervals of 30 feet
  - c. At least one time in each room
  - d. Within 2 feet of all turns, ells, valves, and on the upstream side of all distribution fittings, branches and headers
  - e. On both sides of wall or floor penetrations
  - f. Within 3 feet of penetrating the ground

#### **B. VALVE TAGS:**

- 1. If the association between label or tag and valve or fixture is definitive, then valves and fixtures may use any of the methods identified; otherwise attach a metal tag to the valve or fixture.
- 2. Attach valve tags to the valve stem.

### 3.04 CLEANING AND FLUSHING

#### A. GENERAL:

1. Clean piping systems following completion of testing and prior to connection to operating, control, regulating or instrumentation equipment.

#### B. TYPE 1:

1. Clean piping with a swab or cleaning ball. Flush, disinfect, and test for residual chlorine in accordance with AWWA C651, modified as follows:
  - a. Use liquid chlorine.
  - b. Use the continuous feed method.
  - c. Fill piping with chlorine solution and expel air. Retain solution in piping for 24 hours.
  - d. Test for minimum chlorine residual of 10 ppm at end of 24 hour period. Take at least one sample every 500 feet of piping, in addition to the samples specified in AWWA C651.
  - e. Dispose of chlorinated water as directed by District.
2. The District will perform bacterial testing in accordance with AWWA C651.

#### C. TYPE 2:

1. Clean piping with a swab or cleaning ball. Flush with clean water.

#### D. TYPE 3:

1. Clean piping with a swab or cleaning ball. Flush with airstream. Purge sludge gas and natural gas systems with nitrogen and maintain a nitrogen pad of 10 psi until put in service.

#### E. TYPE 4:

1. Five basic steps are necessary to ensure that “items are cleaned for oxygen service.” These steps are:
  - a. Select a Suitable Cleaning Agent.

<b>Recommended Cleaning Agents for Various Materials</b>		
<b>Material</b>	<b>Recommended Cleaning Agent</b>	<b>Remarks</b>

Aluminum	Diversey 909, or Chlorothene	Rinse off water-soluble agents with generous quantities of hot water. Dry off solvents with oil-free compressed dry air or nitrogen, or allow to air dry.
Copper and Copper Alloys	Metso Beads 2048	Rinse off water-soluble agents with generous quantities of hot water.
Stainless Steel	Metso Beads 2048, or Chlorothene	Rinse off water-soluble agents with generous quantities of hot water. Dry off solvents with oil-free compressed dry air or nitrogen, or allow to air dry.
Iron and Steel	Metso Beads 2048, or Chlorothene	Rinse off water-soluble agents with generous quantities of hot water. Dry off solvents with oil-free compressed dry air or nitrogen, or allow to air dry.
Packing and Gasketing Material Specifications	--	Purchase suitable for oxygen service.
Valves or Equipment	--	Purchase pre-cleaned for oxygen service by the manufacturer.

- b. Remove contaminants. Contaminants include oil, grease, threading compounds, flux, weld metal, chips, filings, and other foreign material. Contaminants may cause ignition by impact or from friction of metallic or non-metallic parts (which are normally safe in oxygen service). Typical cleaning methods include:
- 1) IMMERSION: In this method, immerse the item in a container of cleaning agent.
  - 2) SWABBING: In this method, clean the item with a swab soaked in cleaning agent.
  - 3) SPRAYING: In this method, clean the item with a high velocity nozzle and cleaning agent.
  - 4) FLUSHING: In this method, clean the item by circulating a cleaning agent solution through the item.
  - 5) SANDBLASTING: In this method, clean the item by sandblasting with steel shot or garnet. For steel pipe only.
- c. Remove all cleaning agent residue.

- 1) Remove water-soluble cleaning agents by flushing with large quantities of hot (170°F) clean water. Dry the item by purging with hot (200°F), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving are warm to the touch. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
  - 2) Remove solvent cleaning agents by evaporation. Dry the item by purging with hot (200°F), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving are warm to the touch. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
  - 3) Remove sandblast residue by vacuum, swab, etc. Dry the item by purging with hot (200°F for steel), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving have a -40°F dew point. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
- d. Inspect item for cleanliness.
- 1) If any evidence of contamination is noted, clean the item again.
  - 2) Inspect items visually for gross contamination.
  - 3) After the initial inspection, examine items using an ultraviolet light. A UV light will cause cutting oil and grease to fluoresce. Where direct visual examination is not possible, swab the item, then check the swab with a UV light for contamination.
  - 4) Small, cleaned items to be checked may be placed in a closed box with a UV light and peephole. This shields the specimen from visible light. Special boxes for this purpose are commercially available. Samples also may be inspected under a UV light in a closet or any other dark location. However, it is emphasized that this type of test is not sensitive to all types of carbonaceous contamination, such as animal and vegetable fat, but will detect most cutting oils and machinery lubricants. A UV lamp with a wavelength of approximately 3660Å, at a minimum output of 620 microwatts/cm<sup>2</sup> is particularly suited to test for carbonaceous contaminants.
- e. Protect cleaned items from contamination.
- 1) Use only clean, grease-free gloves, tools, and slings for handling cleaned items.

- 2) Seal manholes, inspection ports, nozzles, and other openings. Use blank flanges bolted in place, plastic protectors, hard board covers, polyethylene bags, polyethylene sheeting, or at least two layers of clean Kraft paper. Label packages whose contents are not visible to identify the contents without breaking the seals.
- 3) Store and assemble cleaned items in areas free from oil mist, lubricants dropping from cranes, and similar contaminating conditions. Wrap or cover items temporarily stored on floor areas with clean paper.

**F. TYPE 5: (CHLORINE LIQUID & GAS, NOT VACUUM OR SOLUTION)**

1. Five basic steps are necessary to ensure that “items are cleaned for chlorine service.” These steps are:
  - a. Select a Suitable Cleaning Agent.

<b>Recommended Cleaning Agents for Various Materials</b>		
<b>Material</b>	<b>Recommended Cleaning Agent</b>	<b>Remarks</b>
PVC	Metso Beads 2048	Rinse off water-soluble agents with generous quantities of hot water. Dry with oil-free compressed dry air or nitrogen, or allow to air dry.
Steel	Metso Beads 2048, or Chlorothene	Rinse off water-soluble agents with generous quantities of hot water. Dry off solvents with oil-free compressed dry air or nitrogen, or allow to air dry.
Packing and Gasketing Material Specifications		Purchase suitable for chlorine service.
Valves or Equipment		Purchase pre-cleaned for chlorine service by the manufacturer.

- b. Remove contaminants.
  - 1) Chlorine may react violently with contaminants. Contaminants include oil, grease, threading compounds, flux, weld metal, chips, filings, and other foreign material. Typical cleaning methods include:
  - 2) IMMERSION: In this method, immerse the item in a container of cleaning agent.

- 3) SWABBING: In this method, clean the item with a swab soaked in cleaning agent.
  - 4) SPRAYING: In this method, clean the item with a high velocity nozzle and cleaning agent.
  - 5) FLUSHING: In this method, clean the item by circulating a cleaning agent solution through the item.
  - 6) SANDBLASTING: In this method, clean the item by sandblasting with steel shot or garnet. For steel pipe only.
- c. Remove all cleaning agent residue.
- 1) Remove water-soluble cleaning agents by flushing with large quantities of hot (170°F) clean water. Dry the item by purging with hot/warm (200°F for steel; 100°F for PVC), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving have a -40°F dew point. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
  - 2) Remove solvent cleaning agents by evaporation. Dry the item by purging with hot (200°F for steel), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving have a -40°F dew point. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
  - 3) Remove sandblast residue by vacuum, swab, etc. Dry the item by purging with hot (200°F for steel), oil-free dry (-60°F dew point maximum) air or nitrogen until all vent gas streams leaving have a -40°F dew point. Purge rates should be at an absolute minimum, allowing adequate time for the purge gas to reach equilibrium when the dew point is taken. Visually inspect the item to be sure that all cleaning agent has been removed.
- d. Inspect item for cleanliness.
- 1) If any evidence of contamination is noted, clean the item again.
  - 2) Inspect items visually for gross contamination.
  - 3) After the initial inspection, examine items using an ultraviolet light. A UV light will cause cutting oil and grease to fluoresce. Where direct visual examination is not possible, swab the item, then check the swab with a UV light for contamination.

- 4) Small, cleaned items to be checked may be placed in a closed box with a UV light and peephole. This shields the specimen from visible light. Special boxes for this purpose are commercially available. Samples also may be inspected under a UV light in a closet or any other dark location. However, it is emphasized that this type of test is not sensitive to all types of carbonaceous contamination, such as animal and vegetable fat, but will detect most cutting oils and machinery lubricants. A UV lamp with a wavelength of approximately 3660A, at a minimum output of 620 microwatts/cm<sup>2</sup> is particularly suited to test for carbonaceous contaminants.
- e. Protect cleaned items from contamination.
- 1) Use only clean, grease-free gloves, tools, and slings for handling cleaned items.
  - 2) Seal manholes, inspection ports, nozzles, and other openings. Use blank flanges bolted in place, plastic protectors, hard board covers, polyethylene bags, polyethylene sheeting, or at least two layers of clean Kraft paper. Label packages whose contents are not visible to identify the contents without breaking the seals.
  - 3) Store and assemble cleaned items in areas free from oil mist, lubricants dropping from cranes, and similar contaminating conditions. Wrap or cover items temporarily stored on floor areas with clean paper.

### **3.05 TESTING**

#### **A. GENERAL:**

1. Upon completion of piping, but prior to application of insulation on non-buried piping, the Contractor shall test the piping systems.
2. Buried piping systems shall be tested upon completion of piping, but prior to backfill.
3. Testing shall be in accordance with this section and the COMMISSIONING Section (01 91 00).
4. Pressures, media and test durations shall be as specified in the PIPESPEC sheets located at the end of this specification section.
5. Equipment which may be damaged by the specified test conditions shall be isolated.
6. Testing shall be performed using certified, calibrated test gauges.
  - a. Required pressure tests of 10 psig or less shall be performed with gauges of 1/10 psig increments or less.



- b. Required pressure tests exceeding 10 psig but less than 100 psig shall be performed with gauges of 1 psig increments or less.
  - c. Required pressure tests exceeding 100 psig shall be performed with gauges incremented for 2% or less of the required test pressure.
  - d. Test gauges shall have a pressure range not greater than twice the test pressure.
7. Testing shall be performed using certified, calibrated volumetric measuring equipment to determine leakage rates.
  8. Testing, as specified herein, shall include existing piping systems that connect with new pipe systems. Existing pipe shall be tested to the nearest existing valve. Any piping which fails the test shall be repaired. Repair of existing piping will be considered and paid for as extra work.

**B. TYPE 1:**

1. Leakage shall be zero at the specified test pressure throughout the specified duration unless specifically allowed in the individual PIPESPEC sheets located at the end of this specification section.

**C. TYPE 2:**

1. Piping systems shall first be pressure tested at the specified test pressure. Leakage shall be zero.
2. Piping systems shall next be vacuum tested at the specified test vacuum. Leakage shall be zero. Vacuum test shall be performed by an independent test company experienced in vacuum testing.

**D. TYPE 3:**

1. Systems shall be tested in accordance with the UPC.

**3.06 TRAINING (NOT USED)**

**3.07 PIPING SYSTEM SPECIFICATION SHEETS**

- A. Piping and valves are specified on individual Piping System Specification (PIPESPEC) sheets located at the end of this specification section. Piping services specified in the PIPESPEC sheets and shown on the drawings are alphabetically arranged by designated service abbreviations as shown in Table A. Table A also indicates the pipe label legend, background color, and lettering color of each service. Existing pipe systems may vary from the PIPESPEC. The Contractor shall field verify the pipe type, location and arrangement required for each connection to existing pipe systems.

Table A, Piping Services

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
A	AERATION AIR	Light Gray	Blue	White
AA	AGITATION AIR	Light Gray	Blue	White
ASH	ASH PNEUMATIC	Light Gray	Black	White
BD	BOILER BLOWDOWN	Light Gray	Green	White
BF	BOILER FEED	Light Gray	Green	White
BRF	BIOSOLIDS RECYCLING FACILITY	Light Gray	Green	White
CAA	CHANNEL AERATION AIR	Light Gray	Blue	White
CC	CENTRIFUGE CAKE	Light Gray	Green	White
CD	CHEM DRAIN/VENT	Light Gray	Orange	Black
CEN	CENTRATE	Light Gray	Green	White
CF	CENTRIFUGE FEED	Light Gray	Green	White
CFE	CHLORINATED FINAL EFFLUENT	Light Gray	Green	White
CL	LOW PRESSURE CONDENSATE	Light Gray	Green	White
CLG	CHLORINE GAS	Orange	Orange	Black
CLL	CHLORINE LIQUID	Orange	Orange	Black
CLS	CHLORINE SOLUTION	Orange	Orange	Black
CLV	CHLORINE VACUUM	Orange	Orange	Black
CM	MEDIUM PRESSURE CONDENSATE	Light Gray	Green	White
CPA	CHEMICAL PAD AIR	Light Gray	Orange	Black
CS	CIRCULATING SLUDGE	Light Gray	Green	White
CSO	CAUSTIC SODA	Bone White	Orange	Black
CWR	CHILLED WATER RETURN	Light Gray	Green	White
CWS	CHILLED WATER SUPPLY	Light Gray	Green	White
D	DRAIN	Light Gray	Green	White

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
DFE	DECHLORINATED FINAL EFFLUENT	Light Gray	Green	White
DIZ	DEIONIZED WATER	Light Gray	Green	White
DS	DIGESTED SLUDGE	Light Gray	Green	White
DSSG	DIGESTED SLUDGE/SLUDGE GAS	Light Gray	Yellow	Black
DWV	DRAIN-WASTE-VENT	Light Gray	Green	White
ED	EQUIPMENT DRAIN	Light Gray	Green	White
EWS	EMERGENCY WASHDOWN SYSTEM	Light Gray	Green	White
FAE	FOUL AIR EXHAUST	Light Gray	Blue	White
FBW	FILTER BACKWASH	Light Gray	Green	White
FC	FERRIC CHLORIDE SOLUTION	Bone White	Orange	Black
FE	FINAL EFFLUENT	Light Gray	Green	White
FMSC	FOAM SUPPRESSING CHEMICAL	Bone White	Orange	Black
FOR	FUEL OIL RETURN	Light Gray	Yellow	Black
FOS	FUEL OIL SUPPLY	Light Gray	Yellow	Black
FTE	FILTERED EFFLUENT	Light Gray	Green	White
GC	GAS CIRCULATION	Light Gray	Yellow	Black
GLY	GLYCOL/WATER COOLANT	Light Gray	Green	White
GR	GRIT	Light Gray	Green	White
GRC	GAS RECIRCULATION COMPRESSOR	Light Gray	Yellow	Black
GRO	GRIT OVERFLOW	Light Gray	Green	White
HCL	HYDROCHLORIC ACID	Bone White	Orange	Black
HNG	HIGH PRESSURE NATURAL GAS	Light Gray	Yellow	Black
HOH	HIGH PRESSURE HYDRAULIC OIL	Light Gray	Yellow	Black
HOL	LOW PRESSURE HYDRAULIC OIL	Light Gray	Yellow	Black
HRR	HEAT RESERVOIR RETURN	Light Gray	Green	White

01/20/17

RFB #8224 MS Tank #1 - Steel Shell  
Replacement Project

40 05 03 - 24

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
HRS	HEAT RESERVOIR SUPPLY	Light Gray	Green	White
HS	HARVESTED SLUDGE	Light Gray	Green	White
HSG	HIGH PRESSURE SLUDGE GAS	Light Gray	Yellow	Black
HSO	SULFURIC ACID	Bone White	Orange	Black
HTV	HIGH TEMPERATURE VENT	Light Gray	Blue	White
HWR	DOMESTIC HOT WATER RETURN	Light Gray	Green	White
HWS	DOMESTIC HOT WATER SUPPLY	Light Gray	Green	White
IA	INSTRUMENT AIR	Light Gray	Blue	White
L	LIME	Bone White	Orange	Black
LOS	LUBRICATING OIL SUPPLY	Light Gray	Yellow	Black
LS	LIME SLURRY	Bone White	Orange	Black
LSG	LOW PRESSURE SLUDGE GAS	Light Gray	Yellow	Black
MG	MIXED GAS	Light Gray	Yellow	Black
ML	MIXED LIQUOR	Light Gray	Green	White
MLF	MIXED LIQUOR FERMENTER	Light Gray	Green	White
MLR	MIXED LIQUOR RECYCLE	Light Gray	Green	White
MS	MIXED SLUDGE	Light Gray	Green	White
MSCS	MIXED SLUDGE/CIRCULATING SLUDGE	Light Gray	Green	White
MSDS	MIXED SLUDGE/DIGESTER SLUDGE	Light Gray	Green	White
MSG	MEDIUM PRESSURE SLUDGE GAS	Light Gray	Yellow	Black
NG	NATURAL GAS	Light Gray	Yellow	Black
OCA	ODOR CONTROL AIR	Light Gray	Blue	White
ODG	OXYGEN DRY GAS	Light Gray	Yellow	Black
OF	OVERFLOW	Light Gray	Yellow	Black
OFSG	OVERFLOW/SLUDGE GAS	Light Gray	Yellow	Black

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
OHP	OXYGEN HIGH PRESSURE	Light Gray	Yellow	Black
OLPD	OXYGEN LOW PRESSURE DISCHARGE	Light Gray	Yellow	Black
OLPS	OXYGEN LOW PRESSURE SUCTION	Light Gray	Yellow	Black
PA	PREAERATION AIR	Light Gray	Blue	White
PAS	PRIMARY AND ACTIVATED SLUDGE	Light Gray	Green	White
PCH	HIGH PRESSURE PROCESS CONDENSATE	Light Gray	Green	White
PCL	LOW PRESSURE PROCESS CONDENSATE	Light Gray	Green	White
PCR	CONDENSATE RETURN	Light Gray	Green	White
PD	PUMPED DRAINAGE	Light Gray	Green	White
PE	PRIMARY EFFLUENT	Light Gray	Green	White
PF	PRESSURIZED FLOW	Light Gray	Green	White
POL	POLYELECTROLYTE	Light Gray	Orange	Black
PRS	PROCESS SAMPLING	Light Gray	Green	White
PS	PRIMARY SLUDGE	Light Gray	Green	White
PSC	PRIMARY SCUM	Light Gray	Green	White
PSCS	PRIMARY SLUDGE/CIRCULATING SLUDGE	Light Gray	Green	White
PSG	PRIMARY SLUDGE AND GRIT	Light Gray	Green	White
PSO	POLYMER SOLUTION	Light Gray	Orange	Black
PSR	PRIMARY SLUDGE RECIRCULATION	Light Gray	Green	White
PSS	PROCESS STEAM SUPPLY	Light Gray	Green	White
RAS	RETURN ACTIVATED SLUDGE	Light Gray	Green	White
RD	ROOF DRAIN	Light Gray	Green	White
RG	REFRIGERANT GAS	Light Gray	Orange	Black
RL	REFRIGERANT LIQUID	Light Gray	Orange	Black

01/20/17

RFB #8224 MS Tank #1 - Steel Shell  
Replacement Project

40 05 03 - 26

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
RS	RAW SEWAGE	Light Gray	Green	White
RWL	RAIN WATER LEADER	Light Gray	Green	White
RWP	RAIN WATER PIPE	Light Gray	Green	White
S	LOW PRESSURE STEAM SUPPLY	Light Gray	Green	White
SA	SERVICE AIR	Light Gray	Blue	White
SBIS	SODIUM BISULFITE	Bone White	Orange	Black
SCD	SCUM DECANT	Light Gray	Green	White
SCLS	SODIUM HYPOCHLORITE SOLUTION	Bone White	Orange	Black
SCO	SCUM OVERFLOW	Light Gray	Green	White
SCR	STEAM CLEAN RINSE	Light Gray	Green	White
SCS	STEAM CLEAN SUPPLY	Light Gray	Green	White
SD	SANITARY DRAIN	Light Gray	Green	White
SE	SECONDARY EFFLUENT	Light Gray	Green	White
SG	SLUDGE GAS	Light Gray	Yellow	Black
SHS	SODIUM HYDROXIDE SOLUTION	Bone White	Orange	Black
SME	SAMPLE-EFFLUENT	Light Gray	Green	White
SMI	SAMPLE-INFLUENT	Light Gray	Green	White
SMML	SAMPLE MIXED LIQUOR	Light Gray	Green	White
SMO	SAMPLE OXYGEN	Light Gray	Yellow	Black
SMP	SAMPLE-PRIMARY EFFLUENT	Light Gray	Green	White
SMS	SAMPLE-SLUDGE	Light Gray	Green	White
SN	SUPERNATANT	Light Gray	Green	White
SOG	SULFUR DIOXIDE GAS	Yellow	Orange	Black
SOL	SULFUR DIOXIDE LIQUID	Yellow	Orange	Black
SOS	SULFUR DIOXIDE SOLUTION	Yellow	Orange	Black
SOV	SULFUR DIOXIDE VACUUM	Yellow	Orange	Black

01/20/17

RFB #8224 MS Tank #1 - Steel Shell  
Replacement Project

40 05 03 - 27

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
SPC	SUPPLEMENTAL CARBON (ACETIC ACID)	Bone White	Orange	Black
SR	SCREENINGS	Light Gray	Green	White
SRA	SCUM REMOVAL AIR	Light Gray	Blue	White
SRF	SCREENINGS FEED	Light Gray	Green	White
SRO	SCREENINGS OVERFLOW	Light Gray	Green	White
SSC	SECONDARY SCUM	Light Gray	Green	White
SSE	SIDESTREAM EFFLUENT	Light Gray	Green	White
STD	STORM DRAIN	Light Gray	Green	White
SWAS	SAMPLE-WASTE ACTIVATED SLUDGE	Light Gray	Green	White
TA	THICKENER AIR	Light Gray	Yellow	Black
TD	TANK DRAIN	Light Gray	Green	White
TE	THICKENER EFFLUENT	Light Gray	Green	White
THS	THICKENED SLUDGE	Light Gray	Green	White
TO	THICKENED OVERFLOW	Light Gray	Green	White
TS	TRANSFER SLUDGE	Light Gray	Green	White
TSC	THICKENED SCUM	Light Gray	Green	White
TWAS	THICKENED WASTE ACTIVATED SLUDGE	Light Gray	Green	White
UA	UTILITY AIR	Light Gray	Blue	White
UD	UNDER DRAIN	Light Gray	Green	White
V	VENT	Light Gray	Green	White
VA	VACUUM	Light Gray	Blue	White
VS	STEAM VENT	Light Gray	Green	White
WAS	WASTE ACTIVATED SLUDGE	Light Gray	Green	White
WFBW	WASTE FILTERED BACKWASH	Light Gray	Green	White
WFP	FIRE PROTECTION WATER	Red	Red	White

<b>Symbol</b>	<b>Pipe Legend</b>	<b>Pipe Paint Color</b>	<b>Pipe Label Background Color</b>	<b>Pipe Label Lettering Color</b>
WFSW	FILTERED SURFACE WASH WATER	Light Gray	Green	White
WHWC	WASTE HEAT COOLING WATER RETURN - COGENERATION	Light Gray	Green	White
WHWR	WASTE HEAT COOLING WATER RETURN	Light Gray	Green	White
WHWS	WASTE HEAT COOLING WATER SUPPLY	Light Gray	Green	White
WI	WETLANDS INFLUENT	Light Gray	Green	White
WML	WASTE MIXED LIQUOR	Light Gray	Green	White
WN	NON-POTABLE WATER	Light Gray	Purple	White
WNI	LANDSCAPE IRRIGATION NON-POTABLE WATER	Light Gray	Purple	White
WNM	WATER NON-POTABLE MONITORING	Light Gray	Green	White
WNS	NON-POTABLE WATER SOFT	Light Gray	Green	White
WP	POTABLE WATER	Light Gray	Green	White
WPS	POTABLE WATER SOFT	Light Gray	Green	White
WRF	RECLAIMED WATER FILTERED	Light Gray	Purple	White
WRH	RECLAIMED WATER HIGH PRESSURE	Light Gray	Green	White
WRL	RECLAIMED WATER LOW PRESSURE	Light Gray	Green	White
WRS	FOAM SUPPRESSING SPRAY WATER	Light Gray	Green	White

**\*\*END OF SECTION\*\***



<b>PIPING SYSTEM SPECIFICATION</b>				
SERVICE: Foul Air Exhaust			SYMBOL: <b>FAE</b>	
FLUID: Foul Air				
<b>PRESSURE – PSIG</b>			<b>TEMPERATURE - °F</b>	
MAX: 0.5	TEST: 1	TEST TYPE: 1	NORMAL: 60	MAX: 100
TEST MEDIUM: Air		TEST DURATION: 120 minutes	CLEANING TYPE:	
<b>PIPE AND FITTING SPECIFICATION</b>				
SIZE	EXPOSURE	PIPE	FITTINGS AND JOINTS	
< 4"	Interior or Exterior	Stainless steel, Sch. 40S; type 316L	Threaded, flanged or grooved end coupling or stainless steel.	
All	All	Flange Gaskets: Neoprene		
		Push-on/Mech. Couplings: Neoprene or Nitrile		
<b>GENERAL VALVE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN VALVE SCHEDULE</b>				
SIZE	EXPOSURE	DUTY	SPECIFICATION	OPERATOR
<b>REMARKS:</b>				

PIPING SYSTEM SPECIFICATION				
SERVICE: Overflow			SYMBOL: <b>OF</b>	
FLUID: Wastewater				
PRESSURE – PSIG			TEMPERATURE - °F	
MAX: 10	TEST: 15	TEST TYPE: 1	NORMAL: 70	MAX: 85
TEST MEDIUM: Water		TEST DURATION: 120 minutes	CLEANING TYPE: 2	
PIPE AND FITTING SPECIFICATION				
SIZE	EXPOSURE	PIPE	FITTINGS AND JOINTS	
< 4"	Interior or Exterior	Steel, ASTM A53 Grade A, Schedule 40, Type E, galvanized or stainless steel, Sch. 40S; type 316L	Malleable iron, ASTM A197, ANSI B16.3, Class 150, galvanized. Threaded, flanged or grooved end coupling or stainless steel.	
	Buried	HDPE, ASTM D3035 or F714, AWWA, SDR 13.5, PE 4710, IPS size, rated 160 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
4" – 12"	Interior or Exterior	Steel, ASTM A53 Grade A, Schedule 40, Type E, black with epoxy lining.	Grooved end couplings, with flanged adapters for valves. Grooved end fittings, ASTM A47 malleable iron, ASTM A536 ductile iron, ASTM A234 steel.	
	Buried	Same as <4" Buried, 4"-6" coiled stock, 8"-12" straight joints.	Same as <4" Buried.	
12"-18"	Interior or Exterior	Steel, AWWA C200, 3/16" wall, black with epoxy pipe lining.	Butt weld, or flanged connections. Epoxy lined fittings	
	Buried	HDPE, ASTM D3035 or F714, SDR 13.5, PE 4710, IPS size, rated 160 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
All	All	Flange Gaskets: Neoprene		
		Push-on/Mech. Couplings: Neoprene or Nitrile		
GENERAL VALVE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN VALVE SCHEDULE				
SIZE	EXPOSURE	DUTY	SPECIFICATION	OPERATOR
< 2.5"	Interior or Exterior	Isolation	Ball valve, Type BR-2P	MLQ
2.5" – 4"	Interior or Exterior	Isolation	Eccentric plug valve, Type EP150	MLQ
	Interior or Exterior	Isolation	Eccentric plug valve, Type EP150	MGQ
All	Buried	Isolation	Resilient wedge gate valve, Type RW200	2" AWWA nut
All	Interior or Exterior	Check	Resilient flapper check valve, Type FDC	
All	All	Drain & vent	Ball valve, Type BR-2P	MLQ
<b>REMARKS:</b> All pipe-to-pipe joints, plugs, caps, tees bends, all other fittings, and valves shall be restrained.				

01/20/17

RFB #8224 MS Tank #1 - Steel Shell  
Replacement Project

40 05 03 - A2

PIPING SYSTEM SPECIFICATION				
SERVICE: Pumped Discharge			SYMBOL: PD	
FLUID: Wastewater				
PRESSURE – PSIG			TEMPERATURE - °F	
MAX: 50	TEST: 150	TEST TYPE: 1	NORMAL: 70	MAX: 125
TEST MEDIUM: Water		TEST DURATION: 120 minutes	CLEANING TYPE: 2	
PIPE AND FITTING SPECIFICATION				
SIZE	EXPOSURE	PIPE	FITTINGS AND JOINTS	
< 4"	Interior or Exterior	Steel, ASTM A53 Grade A, Schedule 40, Type E, galvanized or stainless steel, Sch. 40S; type 316L	Malleable iron, ASTM A197, ANSI B16.3, Class 150, galvanized. Threaded, flanged or grooved end coupling or stainless steel.	
	Buried	HDPE, ASTM D3035 or F714, AWWA, SDR 13.5, PE 4710, IPS size, rated 160 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
4" – 12"	Interior or Exterior	Steel, ASTM A53 Grade A, Schedule 40, Type E, black with epoxy lining.	Grooved end couplings, with flanged adapters for valves. Grooved end fittings, ASTM A47 malleable iron, ASTM A536 ductile iron, ASTM A234 steel.	
	Buried	Same as <4" Buried, 4"-6" coiled stock, 8"-12" straight joints.	Same as <4" Buried.	
12"-18"	Interior or Exterior	Steel, AWWA C200, 3/16" wall, black with epoxy pipe lining.	Butt weld, or flanged connections. Epoxy lined fittings	
	Buried	HDPE, ASTM D3035 or F714, SDR 13.5, PE 4710, IPS size, rated 160 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
All	All	Flange Gaskets: Neoprene		
		Push-on/Mech. Couplings: Neoprene or Nitrile.		
GENERAL VALVE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN VALVE SCHEDULE				
SIZE	EXPOSURE	DUTY	SPECIFICATION	OPERATOR
< 2.5"	Interior or Exterior	Isolation	Ball valve, Type BR-2P	MLQ
2.5" – 4"	Interior or Exterior	Isolation	Eccentric plug valve, Type EP150	MLQ
> 4"	Interior or Exterior	Isolation	Eccentric plug valve, Type EP150	MGQ
All	Buried	Isolation	Resilient wedge gate valve, Type RW200	2" AWWA nut
All	Interior or Exterior	Check	Resilient flapper check valve, Type FDC	
All	All	Drain & vent	Ball valve, Type BR-2P	MLQ
<b>REMARKS:</b> All pipe-to-pipe joints, plugs, caps, tees bends, all other fittings, and valves shall be restrained.				

01/20/17

RFB #8224 MS Tank #1 - Steel Shell Replacement Project

40 05 03 - A3

PIPING SYSTEM SPECIFICATION				
SERVICE: High Pressure Reclaimed Water			SYMBOL: <b>WRH</b>	
FLUID: Reclaimed Water				
PRESSURE – PSIG			TEMPERATURE - °F	
MAX: 140	TEST: 150	TEST TYPE: 1	NORMAL: 70	MAX: 85
TEST MEDIUM: Water		TEST DURATION: 120 minutes	CLEANING TYPE: 2	
PIPE AND FITTING SPECIFICATION				
SIZE	EXPOSURE	PIPE	FITTINGS AND JOINTS	
≤ 2"	Interior or Exterior	Stainless steel, Sch. 40S; type 316L.	Threaded, flanged or grooved end coupling or stainless steel.	
	Buried	HDPE, ASTM D3035 or F714, SDR 11.0, PE 4710, IPS size, rated 200 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
2.5" – 4"	Interior or Exterior	Stainless steel, Sch. 40S; type 316L.	Threaded, flanged or grooved end coupling or stainless steel.	
	Buried	HDPE, ASTM D3035 or F714, SDR 11.0, PE 4710, IPS size, rated 200 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
6"-12"	Interior or Exterior	Steel, ASTM A53 Grade B, Sch. 40, Type E, black with epoxy lining.	Grooved end couplings. Grooved end fittings ASTM A47 malleable iron, ASTM A536 ductile iron, or ASTM A234 steel.	
	Buried	HDPE, ASTM D3035 or F714, SDR 11.0, PE 4710, IPS size, rated 200 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
18"	Buried	HDPE, ASTM D3035 or F714, SDR 11, PE 4710, IPS size, rated 200 psig working pressure.	HDPE molded fittings to match pipe. Joints: Butt-fusion or socket-fusion welded connections. Electrofusion joints are not acceptable.	
All	All	Flange Gaskets: Neoprene		
		Push-on/Mech. Couplings: Neoprene or nitrile		
GENERAL VALVE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN VALVE SCHEDULE				
SIZE	EXPOSURE	DUTY	SPECIFICATION	OPERATOR
≤ 2"	All	Isolation	Ball valve, Type BR-2P	MLQ
≥2.5"	Interior or Exterior	Isolation	Butterfly valve, Type AW150	MGQ
2.5"-10"	Buried	Isolation	Resilient wedge gate valve, Type RW200	2" AWWA nut
≥12"	Buried	Isolation	Butterfly valve, Type AW150	MGQ with 2" AWWA nut
All	All	Check	Silent check valve, Type CGSC	
<b>REMARKS:</b> All pipe-to-pipe joints, plugs, caps, tees bends, all other fittings, and valves shall be restrained.				

**\*\*END OF SECTION\*\***

01/20/17

RFB #8224 MS Tank #1 - Steel Shell  
Replacement Project

40 05 03 - A4

## SECTION 40 05 07

### HANGERS AND SUPPORTS FOR PROCESS PIPING

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. This section specifies requirements for design, selection, installation and inspection of hangers, supports, and seismic restraints for all piping systems specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03), except for fire sprinkler systems. The Drawings specify hangers, supports, and seismic restraints for piping larger than 12-inch nominal diameter that is outside the Contractor's design professional responsibility. All process piping supports and seismic restraints designed by the Contractor's design professional and all supports and seismic restraints specified in the Drawings shall be provided by the Contractor.

###### B. SEISMIC CRITERIA:

1. The design criteria for the seismic restraints for all piping systems shall be in accordance with the California Building Code and the seismic parameters shown on the Drawings. The component importance factor  $I_p$  shall be 1.50. The seismic restraint system shall be designed by a professional Engineer registered in the State of California.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent that they are referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
AISC Manual	Manual of Steel Construction - 13th Edition
ASTM A193 / A193M	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A575	Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
ASTM A576	Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality

<u>Reference</u>	<u>Title</u>
ASTM A1011	Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
ASTM D635	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
CBC	California Building Code
FEDSPEC WW-H-171e	Hangers and Supports, Pipe
MSS SP-58	Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69	Pipe Hangers and Supports - Selection and Application
OSHPD	California Office of Statewide Health Planning and Development
SAE J429	Mechanical and Material Requirements for Externally Threaded Fasteners

#### B. DEFINITIONS:

1. Longitudinal direction: direction parallel to the pipe axis.
2. Lateral/Transverse direction: direction perpendicular to the pipe axis.
3. Essential Facilities: buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes.
4. Exposure location terms used in these specifications are defined as follows:
  - a. Interior: Inside of a building or structure.
  - b. Exterior: Outside of a building or structure and exposed to weather elements.
  - c. Buried: Below grade and in contact with backfill material or concrete encasement. Piping may or may not be insulated.
  - d. Submerged: Submerged or below the top elevation of structures or facilities containing liquids, such as: tanks, channels, digesters, manholes, sumps, basins, rivers, and other areas as indicated or shown on the drawings.

5. Exposure severity terms are defined as follows:
  - a. Mild Environment: Standard commercial facility conditions.
  - b. Moderate Environment: Industrial facility conditions where surfaces may be occasionally exposed to light-moderately aggressive liquids, solids or gases.
  - c. Harsh Environment: Industrial facility conditions where surfaces may be subject to aggressive liquids, solids or gases, or surfaces may be normally exposed to light-moderately aggressive liquids, solids or gases.

### **1.03 SUBMITTALS**

- A. The following information shall be submitted for review in accordance with the SUBMITTAL PROCEDURES Section (01 33 00):
  1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
  2. Manufacturer's information and catalog data showing compliance with this specification and a full description of the product.
  3. Hanger and support locations and hanger components, including elbow thrust restraints as required by the piping system, shall be indicated on the piping layout drawings required by the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03). Pipe hanger spacing shall not exceed the maximum spans shown on the Drawings. Contractor shall provide a legend that includes support identification number, support type, pipe size and service, and support weight. Failure to include this information with pipe layout drawing submittal shall be cause for rejection of the layout drawings.
  4. Pipe hanger, thrust restraints and seismic restraint calculations prepared and stamped by a professional structural or civil engineer registered in the State of California. Calculations shall include the effects of thermal expansion and contraction of the piping system using the temperature ranges included in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).
  5. Seismic restraint locations and components shall be indicated on the piping layout drawings required by the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).

## **PART 2 -- PRODUCTS**

### **2.01 MATERIALS**

#### **A. GENERAL:**

1. All hangers, supports, hardware and components shall be of the material and finish per the following table, unless specifically shown otherwise on the drawings:

	<b>Locations</b>			
	<b>Interior</b>	<b>Exterior</b>	<b>Buried</b>	<b>Submerged</b>
Harsh Environment (not Hypochlorite)	316 SS	316 SS	316 SS	316 SS
Harsh Environment (Hypochlorite)	FRP	FRP	FRP	FRP

SS = Stainless Steel  
FRP = Fiberglass Reinforced Plastic

### **2.02 CHANNEL STRUT**

#### **A. ACCEPTABLE PRODUCTS:**

1. Single channel: B-Line B22; Unistrut P1000; B-Line BFV22SH; or equal.
2. Double channel: B-Line B22A; Unistrut P1001; B-Line BFV22A; or equal.
3. Double deep channel: B-Line B12A; Unistrut P5501; or equal.

#### **B. MATERIALS:**

1. ASTM A240 stainless steel channel shall be 1-5/8 inches square, roll formed, 12-gage material. Channel shall have a continuous slot along one side with in-turned clamping ridges.
2. Fiberglass channel shall be 1-5/8 inches square, pultruded, 1/4-inch thick material with vinyl ester resin. Channel shall meet ASTM E84 Class 1 Flame Rating, and self-extinguishing requirements of ASTM D635. Channel shall have a continuous slot along one side with in-turned clamping ridges. Channel profile shall match steel channel profile.

### **2.03 PIPE HANGERS AND SUPPORTS**

#### **A. TYPE 6 - FRAMING CHANNEL ONE-BOLT PIPE CLAMP:**

1. **ACCEPTABLE PRODUCTS:** B-Line B2000 series; Unistrut P 1109 series; B-Line BFV2000; or equal.
2. **MATERIALS:**



- a. Gage of steel and stainless steel one-bolt clamps shall be as follows:
  - 1) Pipe sizes 3/8 inch and 1/2 inch shall be 16 gage.
  - 2) Pipe sizes 3/4 inch through 1 1/4 inches shall be 14 gage.
  - 3) Pipe sizes 1 1/2 inches through 3 inches shall be 12 gage.
  - 4) Pipe sizes 3 1/2 inches through 5 inches shall be 11 gage.
  - 5) Pipe sizes 6 and 8 inches shall be 10 gage.
- b. FRP clamps shall be glass reinforced polyester or vinyl ester.

**B. TYPE 12 - RISER CLAMP:**

- 1. ACCEPTABLE PRODUCTS: B-Line B3373; Anvil Fig. 261; B-Line B3373 CT; Anvil Figure 261C; or equal.
- 2. MATERIALS: Riser clamps shall comply with MSS and FEDSPEC Type 8.

**2.04 RACK AND TRAPEZE SUPPORTS:**

**A. GENERAL:**

- 1. Trapeze and pipe rack components shall have a maximum deflection 1/240 of the span.

**B. TYPE 20 - TRAPEZE PIPE SUPPORT:**

- 1. MATERIALS: Trapeze pipe support cross members shall be channel strut with flat plate fittings square washer.

**C. TYPE 21 - PIPE SUPPORT RACK:**

**1. MATERIALS:**

- a. Post and cross members shall be channel strut. Channel fittings shall be manufactured by the channel strut manufacturer.
- b. 90-degree fittings shall have gussets. B-Line B844W; Unistrut P2484W; or equal.
- c. Channel strut post base fittings shall be as specified.

## **2.05 DELETED**

## **2.06 DELETED**

## **2.07 THERMAL PIPE HANGER SHIELD**

### **A. COLD PIPE SHIELDS:**

1. ACCEPTABLE PRODUCTS: B-Line B3380-3387; or equal.
2. MATERIALS: Asbestos-free, hydrous calcium silicate insert, treated for water resistance, and encased in a 360° galvanized steel jacket. The jacket thickness shall be as recommended by the manufacturer. Shield shall have butt connection to pipe insulation. Insulation shall extend 1 inch each side of steel jacket for vapor tight connection to pipe insulation vapor barrier. Provide stainless steel band clamps to prevent slippage between the pipe wall and the thermal shield. Temperature range: 20° to 500° F.

## **2.08 SEISMIC RESTRAINTS**

### **A. GENERAL:**

1. Seismic restraint system shall be OSHPD approved for piping in essential facilities, and shall comply with the CBC.
2. Acceptable manufacturers include: Mason Industries Incorporated; Cooper B-Line/TOLCO; or equal.
3. Cable-type seismic bracing will not be acceptable for this project.

## **PART 3 -- EXECUTION**

### **3.01 GENERAL**

#### **A. HANGER AND SUPPORT SELECTION**

1. Select pipe hangers and supports as shown on the drawings and as specified here.
2. Hangers and supports shall withstand all static and specified dynamic conditions of loading to which the piping and associated equipment may be subjected. As a minimum, consider the following conditions:
  - a. Weights of pipe, valves, fittings, insulating materials, suspended hanger components and normal fluid contents.
  - b. Weight of hydrostatic test fluid or cleaning fluid if operating fluid contents are lighter. The type of fluids and testing pressure requirements are specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).

- c. Reaction forces due to the operation of safety or relief valves.
  - d. Reaction forces at bends and elbows due to internal pressures if the piping system is not fully restrained.
  - e. Thermal expansion and contraction due to temperature changes in the fluids conveyed by the piping systems.
  - f. Wind, snow or ice loading on outdoor piping.
3. Where there is horizontal movement at a suspended type hanger location, hanger components shall be selected to allow for swing. The vertical angle of the hanger rod shall not, at any time, exceed 4 degrees.
  4. Provide thermal shields at hanger, support and guide locations on pipe requiring insulation. The thermal shield shall be the same thickness as the piping system insulation specified in Process Piping and Equipment Insulation Specification Section.
  5. There shall be no contact between a pipe and hanger or support component of dissimilar metals. Prevent contact between dissimilar metals by wrapping the pipe with three layers of UPC-listed 20-mil PVC pipe wrap or 1/8-inch-thick 40 durometer neoprene padding as necessary to ensure the isolation material covers the entire contact surface between the pipe and any metallic portion of the support or hanger. Isolation material must be compatible with the environment.

### **3.02 INSTALLATION**

#### **A. HANGER AND SUPPORTS**

1. Locate hangers and supports as near as possible to concentrated loads such as valves, flanges, etc. Locate hangers, supports and accessories within the maximum span lengths specified to support continuous pipeline runs unaffected by concentrated loads.
2. Do not use existing pipes and supports to support new piping.
3. Do not attach pipe support components to pressure vessels.
4. Provide at least one hanger or support within 2 feet from a pipe change in direction.
5. Locate hangers and supports to ensure that connections to equipment, tanks, etc., are substantially free from loads transmitted by the piping.
6. Pipe shall not have pockets formed in the span due to sagging of the pipe between supports caused by the weight of the pipe, medium in the pipe, insulation, valves and fittings.

7. Welded and bolted attachments to the building structural steel shall be in accordance with the requirements of AISC Manual of Steel Construction. Do not drill or burn holes in the building structural steel without written authorization of the structural engineer of record.
8. Do not use hanger components for rigging or erection purposes.
9. Install thermal pipe hanger shields in accordance with the manufacturer's recommendations.
10. Remove burrs and sharp edges from hanger and support components.
11. Rollers shall roll freely without binding. Verify smooth operation prior to placing load on support.
12. Finished floor beneath floor mounted structural attachments and framing channel post bases shall be roughed prior to grouting. Grout between base plate and floor shall be free of voids and foreign material.
13. Provide manufacturer's plastic or rubber end caps at the exposed ends of all framing channels that are located within 7 feet of the floor or ground. Outside caps shall be UV and weather resistant.
14. Adjust hangers and supports to obtain required pipe slope and elevation. Shims made of material that is compatible with the piping material may be used. Adjust stanchions prior to grouting their baseplates.
15. Seal cut ends of hot dip galvanized after fabrication channel and components with ZRC Galvilite Galvanizing Repair Compound, or equal. Grind all sharp edges off. Solvent clean the surface to remove grease and oils. Apply two coats in accordance with the manufacturer's instructions.
16. Seal cut ends of FRP channel and components with UV-resistant sealant coating provided by the FRP channel manufacturer. Apply sealant coating in accordance with the manufacturer's instructions.

**B. SEISMIC RESTRAINT SELECTION AND INSTALLATION:**

1. Unless otherwise specified, the Contractor's design professional shall design, select, and locate seismic restraints for piping to be furnished in accordance with the contract documents.
2. Provide and install seismic restraints in accordance with the Mason Industries Seismic Restraint Guidelines for Suspended Piping, Ductwork and Electrical Systems and the CBC.
3. Piping systems shall not be braced to dissimilar parts of a building or to dissimilar building systems that may respond in a different mode during an earthquake.

Examples: wall and a roof; solid concrete wall and a metal deck with lightweight concrete fill.

4. Restraints shall be sized to fit the outside diameter of the pipe, tubing, or, where specified, the outside diameter of insulation.
5. There shall be no contact between a pipe, duct or raceway and restraint component of dissimilar metals.
6. Branch lines shall not be used to brace main lines.
7. Seismic bracing shall not limit the expansion and contraction of the piping system.

### **3.03 TESTING (NOT USED)**

### **3.04 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***

## SECTION 40 05 23

### STAINLESS STEEL PROCESS PIPE AND TUBING

#### PART 1 -- GENERAL

##### 1.01 GENERAL REQUIREMENTS

###### A. SCOPE:

1. This section specifies stainless steel pipe, fittings, and connections.

##### 1.02 REFERENCES

- A. REFERENCE STANDARDS: The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed references, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
ASNI B16.5	Pipe Flanges and Flanged Fittings NPS ½ Through NPS 24 Metric/Inch Standard
ANSI B31.1	Power Piping
ANSI B31.3	Process Piping
ANSI B1.20.1	Pipe Threads, general purpose
ASME Section IX	Boiler and Pressure Vessel Code; Welding and Brazing Qualifications
ASTM A182/A182M Rev A	Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
ASTM A193/A193M Rev B	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A240/240M	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A312/ A312M	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

<u>Reference</u>	<u>Title</u>
ASTM A351/ A351M	Standard Specification for Castings, Austenitic, for Pressure-Containing Parts
ASTM A380/ A380M	Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
ASTM A403/ A403M	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings
ASTM A733	Standard Specification for Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM A774/ A774M	Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures
ASTM A778	Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products
ASTM F593	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

### **1.03 SUBMITTALS**

- A. The following information shall be submitted for review in accordance with the SUBMITTAL PROCEDURES Section (01 30 00):
1. A copy of this specification section, with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.
  2. Manufacturer's information and catalog data showing compliance with this specification and a full description of the item. A copy of the ASME Certification of Welders and current work history.
  3. Welding procedure for stainless steel.
  4. Calculations for proposed alternative anchorage details.
  5. The Contractor's shop drawings (including fabrication), layout drawings and anchorage details.

## **1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)**

### **PART 2 -- PRODUCTS**

#### **2.01 GENERAL (NOT USED)**

#### **2.02 MATERIALS AND EQUIPMENT**

##### **A. PIPE:**

1. ASTM A312/312M:
  - a. Sizes 1/8 to 2-1/2 inches. Minimum thickness Schedule 40S seamless. Type TP316L. Yield strength 25,000 psi minimum. Tensile strength 75,000 psi minimum.
2. ASTM A778:
  - a. Sizes 3 to 48 inches. Wall thickness shall be equivalent to Schedule 10S or 40S as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03). Type 316L. Yield strength 25,000 psi minimum. Tensile strength 75,000 psi minimum.
3. Additional requirements shall be as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03) or as shown on the drawings.

##### **B. PIPE FITTINGS:**

1. ASTM A182/A182M Rev A Grade F316L forged stainless steel fittings, ANSI B16.5 Class 150.
2. ASTM A351/A351M Grade CF8M cast stainless steel fittings, Class 150. Threaded or socket weld.
3. ASTM A403/A403M WP-W Type 316 stainless steel fittings. Grooved end. Wall thickness shall equal or exceed pipe wall thickness.
4. ASTM A733 Type TP316L seamless stainless steel nipples, Schedule 40S. Threaded.
5. ASTM A774/A774M TP316L as-welded stainless steel. Butt weld or belled end. Elbows, tees, crosses, laterals, wyes, and reducers shall be fabricated from ASTM A240/A240M plate. Elbows shall be smooth flow style. Wall thickness shall equal or exceed pipe wall thickness.



C. PIPE CONNECTIONS:

1. GENERAL:

- a. Connections shall be as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).

2. THREADED CONNECTIONS:

- a. Pipe thread dimensions and size limits shall conform to ANSI B1.20.1.
- b. PIPE THREAD SEALANT:
  - 1) ACCEPTABLE PRODUCTS FOR OXYGEN PIPING: Fluoramics LOX-8 oxygen-safe thread sealant for wet locations, or equal.
  - 2) ACCEPTABLE PRODUCTS FOR NON-OXYGEN PIPING: Teflon tape or Teflon bearing thread compound compatible with the intended service.

3. PIPE FLANGE CONNECTIONS:

- a. FLANGES:
  - 1) ASTM A182/A182M Rev B Grade F316L. ANSI B16.5 Class 150.
  - 2) For piping 3 inches and smaller, provide weld-neck flanges. For piping larger than 3 inches, provide weld-neck or slip-on flanges. Slip-on flanges shall be double welded per ANSI B31.3.
- b. FLANGE GASKETS:
  - 1) Gaskets shall be as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).
- c. FASTENERS:
  - 1) Fasteners shall be ASTM F593 Type 316 stainless steel cap screws with matching washers and nuts, coarse thread.

4. PIPE SLEEVE-TYPE COUPLINGS:

- a. Sleeve-type couplings shall be constructed of stainless steel per the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).

5. PIPE GROOVED END COUPLINGS:

- a. ACCEPTABLE PRODUCTS: Victaulic Style 77S, or equal.
- b. Couplings shall be flexible-type, Type 316 stainless steel.

- c. Bolts, washers and nuts shall be ASTM A193/A193 M Rev B Type 316 Grade B8M stainless steel.
  - d. Gaskets shall be as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).
6. PIPE RESTRAINT DEVICES:
- a. Restraint devices shall be welded stainless steel harness assemblies.

D. PIPE OUTLETS:

- 1. ACCEPTABLE PRODUCTS: Bonney Forge model Sockolet, or equal.
- 2. Outlets shall be Type 316L standard weight stainless steel.
- 3. Welded outlets shall be socket-weld style or butt-weld style.
- 4. Threaded outlets shall comply with ANSI B1.20.1.

**PART 3 -- EXECUTION**

**3.01 GENERAL (NOT USED)**

**3.02 INSTALLATION**

A. PIPE:

- 1. GENERAL:
  - a. Pipe shall be installed in as shown on the drawings.
- 2. ANCHORAGE:
  - a. Supports and anchorage shall be provided as shown on the drawings and as specified in the HANGERS AND SUPPORTS FOR PROCESS PIPING Section (40 05 07). Calculations and drawings for proposed alternative anchorage shall be submitted in accordance with the SUBMITTAL PROCEDURES Section (01 33 00).

B. FITTINGS:

- 1. Fittings shall be installed in accordance with the manufacturer's recommendations.

C. CONNECTIONS:

1. THREADED CONNECTIONS:

- a. Pipe cutting, threading, and jointing shall conform to the requirements of ANSI B31.1 and the fitting manufacturer's installation recommendations.
- b. Lubricate pipe threads in accordance with the lubricant manufacturer's instructions.

2. FLANGED:

- a. Pipe cutting, threading, and jointing shall conform to the requirements of ANSI B31.1 and the fitting manufacturer's installation recommendations.

3. MECHANICAL COUPLING:

- a. Mechanical couplings shall be installed in accordance with the coupling manufacturer's installation recommendations.

4. WELDED:

a. PREPARATION OF SURFACES TO BE WELDED:

- 1) Surfaces of joints to be welded shall be free from mill scale, slag, grease, oil, paint, rust, and other foreign material. Joints to be welded shall be wire-brushed with stainless steel wire brushes and precisely fitted before welding.
- 2) Nicks, gouges, notches, and depressions in the base metal in the area of the joint shall be repaired before the joint weld is made

b. PROCEDURES:

- 1) Piping shall be properly beveled and have a root pass with the TIG (GTAW) process followed by subsequent passes with the TIG (GTAW) process. The same technology shall be employed for all welding passes. Filler wire of L grade only shall be added to all welds to provide a cross section at the weld equal to or greater than the parent metal. Weld deposit shall be smooth and evenly distributed and have a crown of no more than 1/16-inch on the I.D. and 3/32-inch on the O.D. of the piping. Concavity, undercut, cracks, or crevices shall not be allowed. Butt welds shall have full penetration to the interior surface, and inert gas shielding shall be provided to the interior and exterior of the joint. Excessive weld deposits, slag, spatter, and projections shall be removed by grinding. Welds on gasket surfaces shall be ground smooth.

- 2) The welding procedure shall be submitted to engineer for approval prior to performing the work.
- 3) Only weld procedures that have been qualified under ASME Section IX and only welders who have successfully completed performance qualification tests per ASME Section IX on these qualified procedures shall be utilized.
- 4) The whole surface of the piping and welding areas shall be cleaned, descaled, and passivated per ASTM A380.

c. FIELD WELDING:

- 1) Field welding shall be minimized to the greatest extent possible by use of prefabrication of pipe systems at the shop or factory.
- 2) Welding shall be done only when the surfaces are completely free of any moisture. Welding of the pipe shall not be done during periods of high winds or rain unless the areas being welded are properly shielded.
- 3) Joint shall be continuously purged with inert gas during welding procedure.
- 4) Remove all residue, oxide, and heat stain from the welds and the heat affected areas with stainless steel wire brushes or flexible abrasive pads.

d. TACK WELDS, CLIPS, AND OTHER ATTACHMENTS:

- 1) Tack welds, clips, and other attachments shall be removed and defects repaired, except where the tack welds occur within the weld area and these tack welds do not exceed the size of the completed weld. Cracked tack welds shall be removed. Areas to be repaired shall be ground to clean metal and then repaired by building up with weld metal. The repaired areas shall be ground smooth to form a plane surface with the base metal.

e. DEFECTS AND REPAIRS:

- 1) The quality control program for welding and necessary heat treatment shall be submitted for engineer review and approval prior to manufacturing and field installations.
- 2) Welds with cracks, slag inclusions, porosity, undercutting, incomplete penetration, or which are otherwise deficient in quality or made contrary to any provisions of these specifications shall be removed by chipping or grinding throughout their depth to clean base metal. Caulking or peening of welds to correct defects shall not be done. Welds found deficient in dimension but not in quality shall be enlarged by additional welding after thoroughly cleaning the surface of previously deposited metal and the adjoining plate. Weld deposits, slag, weld spatter, and projections into the interior of the pipe shall be removed by grinding.

- 3) The heat affected zone of welding shall be free of intergranular defects. A random metallurgical examination shall be completed by the District to ensure the welding procedure is acceptable.

**D. TAKEDOWN COUPLINGS:**

1. Takedown couplings shall be installed where indicated on the drawings. They shall be flanged or grooved end mechanical coupling type joints as shown on the drawings.

**E. RESTRAINT DEVICES:**

1. Restraint devices shall be installed in accordance with manufacturer's instructions and recommendations to prevent joint separation.

**F. FLEXIBILITY:**

1. Piping passing from concrete to earth or across structural expansion joints shall be provided with flexible couplings or flexible joints where indicated on the drawings. Where required for resistance to pressure, mechanical couplings shall be restrained.

**3.03 TESTING**

- A. Testing of stainless steel pipe shall be as specified in the COMMON WORK RESULTS FOR PIPING SYSTEMS Section (40 05 03).

**3.04 TRAINING (NOT USED)**

**\*\*END OF SECTION\*\***