OLIVENHAIN MUNICIPAL WATER DISTRICT

San Diego County, California

CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

4S RANCH WATER RECLAMATION FACILITY
CLARIFIER DRIVES REPLACEMENT PROJECT

August 2020

Jason P. Hubbard, P.E.
Engineering Manager
# BID FORM CHECKLIST

(To be placed in the Bidder’s Contract Documents in front of the Table of Contents)

<table>
<thead>
<tr>
<th>Bid Form Page</th>
<th>Requirement</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 4</td>
<td>BID NOTICE-Fill in date of the Pre-Bid Conference attended:</td>
<td></td>
</tr>
<tr>
<td>1 of 13</td>
<td>BID FORM- Fill out the form and acknowledge all addenda in the spaces provided at the end of the first paragraph</td>
<td></td>
</tr>
<tr>
<td>2 of 13</td>
<td>BIDDING INSTRUCTIONS- Examination of the site and review of the Contract Documents has been completed</td>
<td></td>
</tr>
<tr>
<td>2 of 13</td>
<td>BIDDING INSTRUCTIONS- Bid Schedules and all Bid forms are to be submitted with this Bid Form Checklist</td>
<td></td>
</tr>
<tr>
<td>3 of 13</td>
<td>BID SCHEDULE A- Fill out all items in the Bid Schedule A, including dollar amounts in words and in numbers for each item</td>
<td></td>
</tr>
<tr>
<td>4 of 13</td>
<td>BID SCHEDULE B- Fill out all items in the Bid Schedule B, including dollar amounts in words and in numbers for each item</td>
<td></td>
</tr>
<tr>
<td>5 of 13</td>
<td>DESIGNATION OF SUBCONTRACTORS- Fill in all information required on the form</td>
<td></td>
</tr>
<tr>
<td>6 of 13</td>
<td>LISTING OF MANUFACTURERS- Fill in all information required on the form</td>
<td></td>
</tr>
<tr>
<td>7 of 13</td>
<td>Fill in the type of Bid Bond enclosed in the first paragraph, and list all principals of the company in the third paragraph</td>
<td></td>
</tr>
<tr>
<td>8 of 13</td>
<td>Fill in Bidder’s license classification, license number, and all other information required in the fourth paragraph, including signature and date</td>
<td></td>
</tr>
<tr>
<td>9 of 13</td>
<td>CERTIFICATE OF DRUG-FREE WORKPLACE- Fill in Bidder’s name at the top and Certification section at the bottom of the page, including signature and date</td>
<td></td>
</tr>
<tr>
<td>10 of 13</td>
<td>CERTIFICATE OF NONDISCRIMINATION- Fill in all information required on the form, including signature and date</td>
<td></td>
</tr>
<tr>
<td>11 of 13</td>
<td>NONCOLLUSION AFFIDAVIT- Fill in all information required on the form including signature and date and provide notarization</td>
<td></td>
</tr>
<tr>
<td>12 of 13</td>
<td>BIDDER’S EXPERIENCE- Fill in all information required on the form and provide signature and date at the bottom</td>
<td></td>
</tr>
<tr>
<td>13 of 13</td>
<td>INSURANCE ACKNOWLEDGEMENT- Fill in all information required on the form and provide signature and date where indicated</td>
<td></td>
</tr>
<tr>
<td>1 of 2</td>
<td>BID BOND- Fill in all required information including dollar amount</td>
<td></td>
</tr>
<tr>
<td>2 of 2</td>
<td>BID BOND- Fill in all required information, provide signatures of the bidder and surety where indicated, provide notarization for principal of bidder and surety, and attach a certified Power of Attorney for surety</td>
<td></td>
</tr>
<tr>
<td>00810 2 of 13</td>
<td>1.04 MARKING AND ADDRESSING BID ENVELOPE- Contract Documents are sealed in an envelope marked and addressed as required in this section</td>
<td></td>
</tr>
</tbody>
</table>

Dated________________        Signature of Bidder______________________________
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<td><strong>BIDDING AND CONTRACT REQUIREMENTS</strong></td>
</tr>
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<td>1 to 4 White</td>
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<td>BID FORM</td>
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<tr>
<td>BID BOND</td>
<td>1 to 2 Yellow</td>
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<tr>
<td>AGREEMENT</td>
<td>1 to 3 Blue</td>
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<td>PERFORMANCE BOND</td>
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<td>PAYMENT BOND</td>
<td>1 to 2 Blue</td>
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<td>CONTRACTOR’S CERTIFICATE REGARDING WORKERS’ COMPENSATION</td>
<td>1 to 2 Blue</td>
</tr>
<tr>
<td>CERTIFICATE OF INSURANCE (WORKERS’ COMPENSATION)</td>
<td>1 to 3 Blue</td>
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<tr>
<td>INSURANCE ENDORSEMENT (WORKERS’ COMPENSATION)</td>
<td>1 to 2 Blue</td>
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<td>CERTIFICATE OF INSURANCE (LIABILITY)</td>
<td>1 to 5 Blue</td>
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<tr>
<td>INSURANCE ENDORSEMENT (LIABILITY)</td>
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<tr>
<td>CERTIFICATE OF INSURANCE (BUILDERS’ RISK &quot;ALL RISK&quot;)</td>
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<tr>
<td>INSURANCE ENDORSEMENT (BUILDERS’ RISK &quot;ALL RISK&quot;)</td>
<td>1 to 2 Blue</td>
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4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

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BIDDING AND CONTRACT REQUIREMENTS
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FOR THE CONSTRUCTION OF
4S WRF
CLARIFIER DRIVES REPLACEMENT PROJECT
FOR THE
OLIVENHAIN MUNICIPAL WATER DISTRICT

NOTICE IS HEREBY GIVEN that the Board of Directors of said District invites and will receive sealed proposals (bids) up to the hour of 2:00 p.m. on the 1st day of October, 2020 for the furnishing to said District of all transportation, labor, materials, tools, equipment, services, permits, utilities, and other items necessary to construct said work. At said time, said proposals will be publicly opened and read aloud at the office of the Olivenhain Municipal Water District, 1966 Olivenhain Road, Encinitas, CA 92024, (760) 753-6466.

Bids shall conform to and be responsive to the Contract Documents for the work. Copies of the Contract Documents will be open to public inspection during business hours in the office of the District.

The District will conduct a Pre-Bid Conference at the 4S Ranch Water Reclamation Facility, 16595 Dove Canyon Road San Diego, CA 92127, at 10:00 a.m. on September 15, 2020.

All questions relative to this project prior to the opening of bids shall be directed to the District (see enclosed Pre-Bid Question Form). It shall be understood that no specification interpretations will be made by telephone nor will any “or equal” products be considered for approval prior to award of the contract. Bidders are encouraged to submit their pre-bid questions as early as possible, in writing by fax or mail, so they can be answered in writing through an addendum if necessary. Questions may be taken verbally; however, written questions will be given priority, and verbal questions run the risk of not being answered. Pre-bid questions will be received up to 5:00 p.m. on September 25, 2020, after which they will not be answered.

Contract Documents consisting of specifications and bidding documents can be downloaded from the “Bids and Planning” link under “About Us” on the home page of the District’s website at www.olivenhain.com. Contract documents are not available at the District. It will be the Bidder’s responsibility to download and acknowledge receipt of all addenda. If you wish to be placed on the plan holders list, please send your company name, contact person, contact phone # and email to cbarrow@olivenhain.com

Each bid shall be submitted on the bid form furnished as part of the Contract Documents and must state the Contractor's applicable license classification, license number, license expiration date, name of license holder, and relationship to Bidder. The license classification required for this project is Class A General Engineering or Class B General Building. Each bid must be accompanied by cash, a cashier’s check, a certified check, or a bidder's bond executed by an admitted surety insurer. This proposal guarantee shall be in an amount of not less than 10 percent
of the amount of the bid and made payable to the order of or for the benefit of the District. Each bid shall be sealed and delivered to District personnel at 1966 Olivenhain Road, Encinitas, CA 92024 on or before the day and hour set for the opening of bids. Bids not marked as being received by District personnel on or before the day and hour of bid opening will be rejected. It is the responsibility of the Bidder to ensure that the bid is received by District personnel on or before the day and hour of bid opening. Said cash, check, or bond shall be given as guarantee that the Bidder will enter into a contract with the District and furnish the required payment and performance bonds and insurance certificates and endorsements if awarded the work, and will be declared forfeited if the Bidder refuses to timely enter into said contract or furnish the required bonds or insurance certificates and endorsements if his bid is accepted. The proposal guarantee of unsuccessful bidders will be returned by the District no later than 60 calendar days following the date of award of contract.

Bidders shall have a minimum of ten (10) years of successful prior experience performing the type of work required by this contract. Where the Bidder is a corporation or partnership, the entity must demonstrate at least ten (10) years of successful experience with the work required by the contract. Bidders failing to demonstrate this experience may be rejected as nonresponsive at the option of the District.

Under the provisions of the California Public Works Apprenticeship Standards, Sections 1777.5, 1777.6, and 1777.7 of the Labor Code, a copy of the "Extract of Public Works Contract Award" has been included. This document will be filed with the California Department of Industrial Relations at the time of the award of the Contract.

The Board of Directors has obtained from the Director of the California Department of Industrial Relations a determination of the general prevailing rate of per diem, wages, and the general prevailing rate for legal holiday and overtime work in the locality in which said work is to be performed for each craft, classification, or type of worker needed. Not less than the determined rates shall be paid to all workers employed in the performance of the contract. Such rates of wages are on the file with the Department of Industrial Relations and in the office of the District and are available to any interested party upon request.

Pursuant to Public Contract Code Section 22300, the Contractor may substitute equivalent securities for retention amounts which this Contract requires. However, the District reserves the right to solely determine the adequacy of the securities being proposed by the Contractor and the value of those securities. The District shall also be entitled to charge an administrative fee, as determined by the District in its sole discretion, for substituting equivalent securities for retention amounts.

The Contractor agrees that the District's decision with respect to the administration of the provisions of Public Contract Code Section 22300 shall be final and binding and not subject to subsequent litigation or arbitration of any kind as to acceptance of any securities being proposed, the value of these securities, the costs of administration and the determination of whether or not the administration should be accomplished by an independent agency or by the District. The District shall be entitled, at any time, to request the deposit of additional securities of a value designated by the District, in the District's sole discretion, to satisfy this requirement. If the District does not receive satisfactory securities within 12 calendar days of the date of the written request, the District shall be entitled to withhold amounts due Contractor until securities of satisfactory value to the District have been received.
Pursuant to Section 995.710 of the Code of Civil Procedures, the Contractor may substitute any of the instruments specified in Code of Civil Procedure Section 995.710 for the performance and payment bonds required by the Contract Documents. All such substitutions shall be subject to review and approval by the District. Contractor agrees to pay all attorney’s fees and all other fees, costs, and expenses incurred by the District in reviewing substitutes proposed by the Contractor and in preparing and implementing any agreements determined appropriate by the District to adequately protect District.

All bidders shall agree to obtain and maintain in full effect all required insurance with limits not less than the amounts indicated. Bidders who fail to comply with the insurance requirements of this contract may have their bids rejected as nonresponsive at the election of the District.

Pursuant to California Labor Code Section 6705, the cost of sheeting, shoring, and bracing of trenches, or equivalent method, where part of the job, shall constitute a separate bid item under these contract documents.

District shall award the contract for the Project to the lowest responsive, responsible Bidder as determined by the District from the BASE BID. District reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process.

The Board of Directors of the District reserves the right to select the schedule(s) under which the bids are to be compared and contract(s) awarded, to reject any and all bids, and to waive any and all irregularities or defects in any bid.

OLIVENHAIN MUNICIPAL WATER DISTRICT

Dated: 8/26/2020

JASON P. HUBBARD, P.E.
ENGINEERING MANAGER
PRE-BID QUESTION FORM

FOR THE CONSTRUCTION OF

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

FOR THE

OLIVENHAIN MUNICIPAL WATER DISTRICT

Prior to the opening of bids, all questions relative to this project shall be directed to Olivenhain Municipal Water District, Attn: Jason Hubbard, Engineering Manager Tel: (760) 753-6466. Bidders are encouraged to submit their pre-bid questions as early as possible, in writing to prebid@olivenhain.com, so they can be answered in writing through addendum, if necessary. Questions may be taken verbally; however, written questions will be given priority, and verbal questions run the risk of not being answered. Pre-bid questions will be received up to 5:00 p.m., September 25, 2020 after which no questions will be taken or answered.
BID FORM

PROPOSAL TO
OLIVENHAIN MUNICIPAL WATER DISTRICT
SAN DIEGO COUNTY, CALIFORNIA

FOR THE CONSTRUCTION OF

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

Name of Bidder: ____________________________________________________________

Business Address: ____________________________________________________________________ Phone No.: ____________________

TO THE GOVERNING BODY OF THE OLIVENHAIN MUNICIPAL WATER DISTRICT

Pursuant to and in compliance with your Notice Inviting Sealed Proposals (Bids) and the other documents relating thereto, the undersigned Bidder, being fully familiar with the terms of the Contract Documents, local conditions affecting the performance of the Contract, the character, quality, quantities, and scope of the work, and the cost of the work at the place where the work is to be done, hereby proposes and agrees to perform within the time stipulated in the Contract, including all of its component parts and everything required to be performed, and to furnish any and all of the labor, material, tools, equipment, transportation, services, permits, utilities, and all other items necessary to perform the Contract and complete in a workmanlike manner, all of the work required in connection with the construction of said work all in strict conformity with the Plans and Specifications and other Contract Documents, including Addenda Nos. __, __ and __ for the prices hereinafter set forth.

The undersigned as Bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any person, firm, or corporation; and he proposes and agrees, if the proposal is accepted, that he will execute a Contract with the Owner in the form set forth in the Contract Documents.
BIDDING INSTRUCTIONS

FOR THE CONSTRUCTION OF

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

Prior to the opening of bids, all questions relative to this project shall be directed to the Owner. Bidders are encouraged to submit their pre-bid questions as early as possible, in writing by fax or mail, so they can be answered in writing through addendum, if necessary. Questions may be taken verbally; however, written questions will be given priority, and verbal questions run the risk of not being answered. Pre-bid questions will be received up to 5:00 p.m., September 25, 2020, after which they will not be answered.

Bidders shall have a minimum of ten (10) years of successful prior experience performing the type of work required by this Contract. Bidders failing to demonstrate this experience may be rejected as nonresponsive at the option of the Owner.

Bidders agree to obtain and maintain in full effect all required insurance with limits not less than the amounts indicated. Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company. Bidders who fail to comply with the insurance requirements of this Contract may have their bids rejected as nonresponsive at the election of the Owner.

The Bidder's attention is directed to Article 3-1 "Award of Contract or Rejection of Bids" in the General Provisions concerning the above conditions.

Bidders must satisfy themselves as to the character of the work to be performed by examination of the site and review of the Contract Documents. After bids have been submitted, the Bidder expressly waives the right to assert that there was a misunderstanding concerning the nature of the work to be done. Any bid protests must be submitted in writing within three (3) calendar days of the bid.

The Contract Documents contain the provisions required for the construction of the Project. Information obtained from an officer, agent, or employee of the Owner or any other personnel shall not affect the risks or obligations assumed by the Contractor, or relieve him from fulfilling any of the conditions of the Contract.

Bids shall be submitted on the Bid Form and Bid Bond included within these Contract Documents. Bidders shall designate the subcontractors and list the manufacturers of materials to be used in the Project on the Designation of Subcontractors form included with these Contract Documents. All subcontractors listed to perform any of the work must be licensed in the State of California. No single subcontractor may perform more than 25% of the work listed in the Bid Schedule unless specifically approved in advance by the District prior to the submission of bids. The Owner reserves the right to find a bid non-responsive in its sole discretion if a Bidder lists any unlicensed subcontractors to perform any of the work. Submit with the bid the completed Certificate of Drug-Free Workplace, Certificate of Nondiscrimination, Noncollusion Affidavit, Designation of Subcontractors, Bidder's Experience, and Insurance Acknowledgment included in the Bid Form. Completely fill out the one page Bid Form Checklist included in front of the Table of Contents and include with your bid. While this is encouraged to prevent the exclusion of necessary documents, it is not required with the bid submission. The Owner reserves the right to find a bid non-responsive in its sole discretion of a Bidder fails to complete or include any of the aforementioned certificates or acknowledgements.

The pay items listed in each Bid Schedule are described in Specification Section 01150 – Measurement and Payment.

Basis for the award shall be based on the total Base Bid price; all other bid items or schedules, regardless of order or priority, may be awarded at the District's discretion.
### 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

#### BASE BID - SCHEDULE A

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mobilization, Demobilization, Bonds, Permits, Insurance, &amp; Cleanup for all work required under this Bid Schedule¹:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
</tr>
<tr>
<td>2.</td>
<td>SYSTEM SUPPLIER services for all work required under this Bid Schedule:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
</tr>
<tr>
<td>3.</td>
<td>Clarifier Drive and Motor Assembly No. 1 removal and installation of pre-purchased clarifier drive including bridge removal and reinstallation, transport installing, start-up and testing of clarifier drive and motor assembly including all incidentals and appurtenant items:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
</tr>
<tr>
<td>4.</td>
<td>Clarifier Drive and Motor Assembly No. 2 removal and installation of pre-purchased clarifier drive including bridge removal and reinstallation, transport installing, start-up and testing of clarifier drive and motor assembly including all incidentals and appurtenant items:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
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*TOTAL AMOUNT OF BASE BID - SCHEDULE A*  
$____________________

*TOTAL AMOUNT OF BASE BID - SCHEDULE A (IN WORDS)*

________________________________________________________________________

________________________________________________________________________
## 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
### ADD ALTERNATE BID - SCHEDULE B

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Remove and replace all conduit and associated connectors from the clarifier bridge to the Clarifier Drive and Motor Assembly No. 1 including all incidentals and appurtenant items:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
</tr>
<tr>
<td>2.</td>
<td>Remove and replace all conduit and associated connectors from the clarifier bridge to the Clarifier Drive and Motor Assembly No. 2 including all incidentals and appurtenant items:</td>
<td>1</td>
<td>LS</td>
<td>$____________</td>
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</table>

**TOTAL AMOUNT OF ADD ALTERNATE BID - SCHEDULE B**  
$____________________

**TOTAL AMOUNT OF ADD ALTERNATE - BID SCHEDULE B (IN WORDS)**

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern.

*Basis for the award shall be based on the total Base Bid price; all other bid items or schedules, regardless of order or priority, may be awarded at the District’s discretion.

The above prices shall include all labor, materials, removal, overhead, profit, insurance, and incidentals required to complete the work.

*Mobilization is limited to 10% of the total bid price.

Note: By submission of this Bid, the Contractor acknowledges the two year guarantee as outlined in Section 5-14 of the General Provisions and has included said expenses as a part of this Bid.
DESIGNATION OF SUBCONTRACTORS

In compliance with the provisions of Section 4100-4114 of the Public Contract Code of the State of California, and any amendments thereof, each Bidder shall set forth below, the name, license number, and location of the mill, shop or office of each subcontractor who will perform work or labor, or render service to the Contractor in an amount in excess of one-half (1/2) of one (1) percent (0.5%) of the total bid, and the portion of the work which will be done by each subcontractor. All subcontractors listed must be licensed to perform the subcontract work in the State of California. No single subcontractor may perform work in excess of 25% of the total work listed in the Bid Schedule unless specifically approved by the District in advance of submission of the Bid. Bidders who list any unlicensed subcontractors on this form may have their bid rejected as non-responsive in the sole discretion of Owner.

If the Bidder fails to specify a subcontractor for any portion of the work in excess of one-half (1/2) of one (1) percent (0.5%) of the total bid to be performed under the Contract, he shall be deemed to have agreed to perform such portion himself, and he shall not be permitted to subcontract that portion of the work except under conditions permitted by law.

Subletting or subcontracting any portion of the work as to which no subcontractor was designated in the original bid shall only be permitted in case of public emergency or necessity, or otherwise permitted by law, and then only after a finding is reduced to writing as a public record of the Owner.

<table>
<thead>
<tr>
<th>Trade</th>
<th>% of Work To Be Done</th>
<th>Name of Subcontractor</th>
<th>License Number</th>
<th>Address</th>
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The Contractor shall submit this sheet with his bid, completed, to list the manufacturers of materials he intends to use. It shall be understood that where the Contractor elects to not use the material manufacturers called for in the Specifications, he will substitute only items of equal quality, durability, functional character, and efficiency as determined and approved by the Owner. The Contractor should ascertain the acceptability of substitutes prior to bidding. Only one manufacturer shall be listed for each item.

<table>
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<th>Item or Material</th>
<th>Manufacturer</th>
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Substitutions shall be allowed only if requested in accordance with Article 5-10 of the General Provisions within 35 calendar days of the date the Contract is awarded. Should a substitution be allowed, there will be no increase in the amount of the bid originally submitted.
ACCOMPANYING THIS PROPOSAL IS
(insert the words "cash", "a cashier's check", "a certified check", or "a Bidder's bond" as the case may be) in an amount equal to at least 10 percent of the total amount of the Bid, payable to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

The undersigned deposits the above-named security as a proposal guarantee and agrees that it shall be forfeited to the Owner as liquidated damages in case this proposal is accepted by the Owner and the undersigned fails to execute a contract with the Owner as specified in the Contract Documents or fails to furnish the required payment and performance bonds, and insurance certificates and endorsements. Should the Owner be required to engage the services of an attorney in connection with the enforcement of this bid, Bidder promises to pay Owner's reasonable attorneys' fees, incurred with or without suit.

The names of all persons interested in the foregoing proposals as principals are as follows: (NOTICE - If Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a general partnership, state true name of firm, also names of all individual partners composing firm; if a limited partnership, the names of all general partners and limited partners; if Bidder or other interested person is an individual, state first and last names in full; if the Bidder is a joint venture, state the complete name of each venturer).

The Owner has determined the license classification necessary to bid and perform the subject contract. In no case shall this Contract be awarded to a specialty contractor whose classification constitutes less than a majority of the project. When a specialty contractor is authorized to bid a portion of the work of this contract, all work to be performed outside of the contractor's license specialty, except work specifically authorized by the Owner, shall be performed by a licensed subcontractor in compliance with the Subletting and Subcontracting Fair Practices Act commencing with Section 4100 et seq., of the Public Contract Code. See Business and Professions Code Section 7059.

The Contractor's license classification(s) required for this project are as follows:

CLASS A – GENERAL ENGINEERING, or

CLASS B – GENERAL BUILDING

It is the Owner's intent that "plans," as used in Public Contract Code Section 3300, is defined as the construction Contract Documents, which include both the Plans and the Specifications.
Bidder warrants and represents that it has at least ten (10) years of successful experience performing the type of work required by this Contract.

Bidder warrants and represents, under penalty of perjury, that license(s) required by California State Contractor's License Law for the performance of the subject project are in full effect and proper order. Bidders must state, under penalty of perjury, the Contractor's applicable license classification, license number, license expiration date, name of license holder, and relationship to Bidder. Any bid not containing this information may be considered nonresponsive and may be rejected by the Owner.

Bidders relying upon licenses of Responsible Managing Employees (RME) or Responsible Managing Officers (RMO) agree to provide the Owner with all information it determines necessary to verify that the Bidder complies with California State Contractor's License Law.

License Classification: ________________________________
License Number: ____________________________________
Expiration Date: ____________________________________
Name of License Holder: ______________________________
Relationship to Bidder: ______________________________
Name of Bidder: ____________________________________
Signatures: ________________________________________

Dated: __________________________, 20__

NOTE: If Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation and the corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; if the Bidder is an individual, his signature shall be placed above; if the Bidder is a joint venture, the name of the joint venture shall be set forth above with the signature of an authorized representative of each venturer.
CERTIFICATE OF DRUG-FREE WORKPLACE

BIDDER: ________________________________________________________________

The Bidder named above hereby certifies compliance with Government Code Section 8355 in matters relating to providing a drug-free workplace. The above named Bidder will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).

2. Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b), to inform employees about all of the following:
   (a) The dangers of drug abuse in the workplace,
   (b) The person’s or organization’s policy of maintaining a drug-free workplace,
   (c) Any available counseling, rehabilitation and employee assistance programs, and
   (d) Penalties that may be imposed upon employees for drug abuse violations.

3. Provide as required by Government Code Section 8355(c), that every employee who works on the proposed contract or loan:
   (a) Will receive a copy of the company’s drug-free policy statement, and
   (b) Will agree to abide by the terms of the company’s statement as a condition of employment on the contract or loan.

________________________________________
CERTIFICATION

I, the official named below, hereby swear that I am duly authorized legally to bind the Bidder to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL’S NAME: __________________________________________________________

DATE EXECUTED: ____________ EXECUTED IN COUNTY OF: _________________

OFFICIAL’S SIGNATURE: ___________________________________________________

TITLE: ________________________________________________________________
CERTIFICATE OF NONDISCRIMINATION

1. During the performance of this contract, Bidder and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Bidders and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Bidder and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.) and the applicable regulations promulgated thereunder (California Administrative Code, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900, set forth in Chapter 5 of Division 4 of Title 2 or the California Administrative Code are incorporated into this contract by reference and made a part hereof as if set forth in full. Bidder and its subcontractor shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

2. This Bidder shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

THE UNDERSIGNED CERTIFIES THAT THE BIDDER WILL COMPLY WITH THE ABOVE REQUIREMENTS.

BIDDER NAME: ________________________________

CERTIFIED BY:

NAME: ________________________ TITLE: ________________________

SIGNATURE: ________________________ DATE: ________________________
NONCOLLUSION AFFIDAVIT

State of ____________________________ )
                                       ) ss.
County of ____________________________ )

I, ________________________________, being duly sworn, deposes

and says that he or she is ________________________________, the party making the

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

Signature of Bidder: _______________

Subscribed and sworn to before me on this_______ day of _____________________, 20__.
BIDDER'S EXPERIENCE

Name of Bidder: 

License Number: 

List a minimum of five (5) similar projects successfully completed by the Bidder during the last ten (10) years. Projects not similar in scope, fee, and complexity will not be considered as representative of this project.

<table>
<thead>
<tr>
<th>Project Name and Location</th>
<th>Project Owner's Name, Address &amp; Telephone No.</th>
<th>Date Completed</th>
</tr>
</thead>
</table>

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

Dated: ________________, 20__  

(Signature of Bidder)
INSURANCE ACKNOWLEDGMENT

On behalf of the Bidder making this proposal, the undersigned warrants and represents that the Bidder has carefully read and understood all of the insurance requirements of the Contract Documents and has included the full cost of providing insurance meeting all requirements of the Contract Documents in the bid.

Upon request by Owner prior to the time of Award, the Bidder agrees to promptly provide Owner with letters from insurance companies meeting the requirements of the Contract Documents verifying that they are prepared to issue insurance to Bidder meeting all requirements of the Contract Documents. The failure of Bidder to provide Owner with this proof of insurance prior to the time of Award shall entitle Owner to reject the Bidder's bid as nonresponsive and to Award the bid to the next lowest Bidder at the sole discretion of Owner.

The failure of Bidder to provide Owner with insurance meeting all requirements of the Contract Documents within 15 calendar days after the Award, shall constitute a material breach of the Contract, entitling Owner to terminate the Contract and call the bid bond.

By dating and executing this Insurance Acknowledgment, Bidder hereby accepts all terms and conditions of this Insurance Acknowledgment and agrees to be bound by all of its terms.

Dated: ________________, 20___

__________________________________________
(Name of Bidder)

__________________________________________
(Signature)

__________________________________________
(Typed Name and Title)
BID BOND

We, __________________________________________________________ as Principal, and
_____________________________________________________________ as Surety, jointly and severally, bind
ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of____________________Dollars
($___________), lawful money of the United States. Principal has submitted the accompanying
bid for the construction of

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

If the Principal is awarded the Contract and enters into a written contract, in the form prescribed by
the Owner, at the price designated by his bid, and files two bonds with the Owner, one to
guarantee payment for labor and materials and the other to guarantee faithful performance, in the
time and manner specified by the Owner, and carries all insurance in type and amount which
conforms to the Contract Documents and furnishes required certificates and endorsements
thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Forfeiture of this bond, or any deposit made in lieu thereof, shall not preclude the Owner from
seeking all other remedies provided by law to cover losses sustained as a result of the Principal's
failure to do any of the foregoing.
Principal and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner’s reasonable attorney’s fees incurred with or without suit.

Executed on __________________________, 20___

__________________________________________
PRINCIPAL

By: ________________________________

(Seal if Corporation)  Title: ________________________________

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

__________________________________________ (name and address of Surety)

__________________________________________

__________________________________________

__________________________________________ (name and address of Surety’s agent for service of process in California, if different from above)

__________________________________________

__________________________________________ (telephone number of Surety’s agent in California)

(Attach Acknowledgment)

__________________________________________
SURETY

By: ________________________________

(Associate-in-Fact)

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California. A certified copy of the Power of Attorney must be attached.
AGREEMENT

THIS AGREEMENT, made and entered into by and between the

OLIVENHAIN MUNICIPAL WATER DISTRICT

hereinafter referred to as "OWNER" and

___________________________________________________________;

a corporation under the laws of the state of______________________________________________;

a partnership composed of______________________________________________________________;

a joint venture composed of______________________________________________________________;

an individual doing business as____________________________________________________________;

hereinafter referred to as "CONTRACTOR."

OWNER and CONTRACTOR agree as follows:

(1) SCOPE OF WORK: CONTRACTOR will furnish all materials and will perform all of the work for the construction of the

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

in accordance with the plans and specifications and other contract documents therefor.

(2) TIME OF COMPLETION: The work shall be completed within the times set forth in the Special Provisions. Time is of the essence.

(3) CONTRACT SUM: OWNER will pay CONTRACTOR in accordance with the prices shown in the Bid Form.

(4) PAYMENTS: Monthly progress payments and the final payment will be made in accordance with the General Provisions as modified by the Special Provisions. The filing of the notice of completion by OWNER shall be preceded by acceptance of the work made only by an action of the Governing Body of OWNER in session.

(5) COMPLIANCE WITH PUBLIC CONTRACTS LAW: OWNER is a public agency in the State of California and is subject to the provisions of law relating to public contracts. It is agreed that all provisions of law applicable to public contracts are a part of this Contract to the same extent as though set forth herein and will be complied with by CONTRACTOR.

(6) CONTRACT DOCUMENTS: The complete contract includes all the contract documents set forth herein, to wit: Notice Inviting Sealed Proposals (Bids), Bid Form, Bid Bond, Agreement,

This Agreement is executed by the OWNER pursuant to an action of its Governing Body in session on ________________, 20____, authorizing the same, and CONTRACTOR has caused this Agreement to be duly executed.

Dated: ________________, 20____ By: ________________________________

(Authorized Representative of Owner)

Title: GENERAL MANAGER

Dated: ________________, 20____ ________________________________

(Contractor)

By: ________________________________

(Authorized Representative of Contractor)

Title: ________________________________

(Seal if Corporation)

(Attach Acknowledgment for Authorized Representative of Contractor)

APPROVED:

______________________________ ________________________________

(Artyor for OWNER) Date
CERTIFICATE OF CONTRACTOR

I, ________________________________, certify that I am a/the ________________________________ in the entity named as CONTRACTOR in the foregoing contract.

I hereby expressly certify that the name of the entity to which I am associated is ________________________________;

that this entity is in good standing and has complied with all applicable laws and regulations, and that I have been expressly authorized by the proper parties in this entity to execute this contract on behalf of the above-named entity.

__________________________
(Signature)

ATTEST:

__________________________
Name: ________________________________
(Please Type)

Title: ________________________________
PERFORMANCE BOND

We, __________________________________________________________ as Principal,

and __________________________________________________________ as Surety, jointly and
severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of _____________________________

__________________________________________ Dollars ($______________________________ ),

lawful money of the United States. Owner has awarded Principal a contract for the construction of

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Principal shall in all things abide by
and well and truly keep and perform the covenants, and agreements in the said contract, and any
alteration thereof made as therein provided, on his part to be kept and performed at the time and in
the manner therein specified, including all guarantees of workmanship and/or materials for a three
(3) year period, and shall indemnify and save harmless the Owner, District, the Engineer/Architect,
the Owner's Representative, and their consultants, and each of their directors, officers, employees,
and agents, as therein stipulated, this obligation shall become null and void, otherwise, it shall be
and remain in full force and effect.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the contract,
or the work to be performed thereunder, or the plans and specifications shall in any wise affect its
obligation on this bond, and it does hereby waive notice thereof.

Principal and Surety agree that if the Owner is required to engage the services of an attorney in
connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees
incurred, with or without suit, in addition to the above sum.
Executed in four original counterparts on ________________, 20__

PRINCIPAL

By: ______________________________

(Seal if Corporation) Title: ______________________________

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

______________________________ (name and address of Surety)

______________________________

______________________________

______________________________ (name and address of Surety’s agent for service of process in California, if different from above)

______________________________

______________________________ (telephone number of Surety’s agent in California)

(Attach Acknowledgment)

SURETY

By: ______________________________

(Attorney-in-Fact)

APPROVED:

______________________________ (Attorney for OWNER) ______________ Date

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must meet all requirements of Code of Civil Procedure Section 995.660(a). A certified copy of the Power of Attorney must be attached.
PAYMENT BOND

We, ________________________________ as Principal, and ________________________________ as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of ________________________________

______________________________ Dollars ($______________________________),

lawful money of the United States. Owner has awarded Principal a contract for the construction of

4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

If Principal or any of his subcontractors fails to pay any of the persons named in Section 3181 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract or during the three-year guarantee period, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, then Surety will pay the same in an amount not exceeding the sum specified above, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fees as shall be fixed by the court.

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

Surety agrees that no change, extension of time, alteration, or addition to the terms of the contract, or the work to be performed thereunder, or the plans and specifications shall in any wise affect its obligation on this bond, and it does hereby waive notice thereof.

Principal and Surety agree that should Owner become a party to any action on this bond that, each will also pay Owner's reasonable attorney's fees incurred therein in addition to the sum above set forth.
Executed in four original counterparts on ____________________, 20___

__________________________________________ PRINCIPAL

By: _________________________________________

(Seal if Corporation) Title: _______________________

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

_____________________________________________ (name and address of Surety)

_____________________________________________

_____________________________________________

_____________________________________________ (name and address of Surety's agent for service of process in California, if different from above)

_____________________________________________

_____________________________________________ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

_____________________________________________ SURETY

By: _________________________________________

(Attorney-in-Fact)

APPROVED:

_________________________ (Attorney for OWNER) ____________ Date

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must meet all requirements of Code of Civil Procedure Section 995.660(a). A certified copy of the Power of Attorney must be attached.
CONTRACTOR’S CERTIFICATE
REGARDING WORKERS’ COMPENSATION

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT

Labor Code Section 3700:

"Every employer except the State shall secure the payment of compensation in one or more of the following ways:

(a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.

(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees.

(c) For all political subdivisions of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers’ compensation claims, which certificate may be given upon furnishing proof satisfactory to the director of ability to administer workers’ compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which, on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers’ compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702."

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.
Dated: ____________________, 20___

______________________________
(Contractor)

By: _____________________________
(Authorized Representative of Contractor)

Title: _____________________________

(Seal if Corporation)

(Labor Code Section 1861 provides that the above certificate must be signed and filed by the Contractor with the Owner prior to performing any work under this Contract.)
CERTIFICATE OF INSURANCE

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: WORKERS’ COMPENSATION INSURANCE AND EMPLOYER’S LIABILITY INSURANCE

THIS IS TO CERTIFY that the following policy has been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-2 of the General Provisions and is in force at this time.

The Company will give at least 30 days’ written notice by certified mail to the Owner and Engineer/Architect prior to any material change or cancellation of said policy.

<table>
<thead>
<tr>
<th>POLICY NUMBER</th>
<th>EXPIRATION DATE</th>
<th>TYPE OF INSURANCE</th>
<th>LIMITS OF LIABILITY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A. WORKERS’ COMPENSATION</td>
<td>Statutory Limits Under the Laws of the State of California</td>
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<tr>
<td></td>
<td></td>
<td>B. EMPLOYER’S LIABILITY</td>
<td>Each Employee Each Accident</td>
</tr>
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<td></td>
<td>Bodily Injury By Accident</td>
<td>$ $</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bodily Injury By Disease</td>
<td>$ $</td>
</tr>
</tbody>
</table>

Named Insured (Contractor) ___________________________ Insurance Company ___________________________
Street Number ___________________________ Street Number ___________________________
City and State ___________________________ City and State ___________________________

By: ___________________________
(Company Representative)
(SEE NOTICE ON PAGE 3 OF 3)

NOTARY PUBLIC
State of _____________________________ )

                                      ss.
County of _____________________________ )

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

On ______________________________ before me,_______________________________________________

Date  Here Insert Name and Title of the Officer

Personally appeared _________________________________________________________________

Name(s) of Signer(s)

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

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

WITNESS my hand and official seal

________________________________________
NOTARY PUBLIC

Insurance Company Agent for Service of Process in California:

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency</th>
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<tbody>
<tr>
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<tr>
<td>Street Number</td>
<td>Street Number</td>
</tr>
<tr>
<td>City and State</td>
<td>City and State</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>Telephone Number</td>
</tr>
</tbody>
</table>

This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term, or condition of any contract or other document with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.
NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
INSURANCE ENDORSEMENT

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: WORKERS’ COMPENSATION INSURANCE AND EMPLOYER’S LIABILITY INSURANCE

This endorsement forms a part of Policy No. ________________________________.

ENDORSEMENT:

It is agreed that with respect to such insurance as is afforded by the policy, the Company waives any right of subrogation it may acquire against the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents by reason of any payment made on account of injury, including death resulting therefrom, sustained by any employee of the insured, arising out of the performance of the above-referenced contract.

This endorsement does not increase the Company's total limits of liability.

_____________________________  ________________________________

Named Insured (Contractor)    Insurance Company

_____________________________

Street Number

_____________________________

Street Number

_____________________________

City and State

_____________________________

City and State

By: _____________________________

(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)
A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

On ______________________________ before me, ________________________________________________,

Date  Here Insert Name and Title of the Officer

Personally appeared _____________________________________________________________________

Name(s) of Signer(s)

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

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

WITNESS my hand and official seal

____________________________
NOTARY PUBLIC

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact above form shall be provided for each policy.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
CERTIFICATE OF INSURANCE

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: LIABILITY INSURANCE

THIS IS TO CERTIFY that the following policies have been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-3 of the General Provisions and are in force at this time. The policy shall be an occurrence policy with a deductible not to exceed $5,000.

<table>
<thead>
<tr>
<th>POLICY NUMBER</th>
<th>EXPIRATION DATE</th>
<th>TYPE OF INSURANCE</th>
<th>LIMITS OF LIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A. GENERAL LIABILITY</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bodily Injury, Personal Injury, and Property Damage Combined</td>
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<td></td>
<td>B. EXCESS GENERAL LIABILITY</td>
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<td></td>
<td>C. AUTOMOBILE LIABILITY</td>
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<td></td>
<td></td>
<td>Bodily Injury and Property Damage Combined</td>
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<td></td>
<td></td>
<td>D. EXCESS AUTOMOBILE LIABILITY</td>
<td>$</td>
</tr>
</tbody>
</table>
The following types of coverage are included in said policies (indicate by "X" in space):

A. GENERAL LIABILITY

Comprehensive Form-------------------------YES__ NO__
Premises-Operations-------------------------YES__ NO__
Explosion and Collapse Hazard------------------- YES__ NO__
Underground Hazard---------------------------YES__ NO__
Products/Completed Operations Hazard----------YES__ NO__
Contractual Insurance------------------------YES__ NO__
Broad Form Property Damage Including Completed Operations---------YES__ NO__
Independent Contractors---------------------YES__ NO__
Personal Injury-------------------------------YES__ NO__

B. EXCESS GENERAL LIABILITY

Umbrella Form--------------------------------YES__ NO__
Other Than Umbrella Form---------------------YES__ NO__

If other than Umbrella Form, please explain below:

C. AUTOMOBILE LIABILITY

Comprehensive Form Including Loading and Unloading -------------------YES__ NO__
Owned -----------------------------------------YES__ NO__
Hired ------------------------------------------YES__ NO__
Non-Owned--------------------------------------YES__ NO__

D. EXCESS AUTOMOBILE LIABILITY

Umbrella Form--------------------------------YES__ NO__
Other Than Umbrella Form---------------------YES__ NO__

If other than Umbrella Form, please explain below:
This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. However, the insurance provided shall meet the requirements of the Contract Documents and include coverage as specified in this certificate.

The Company will give at least 30 days' written notice by certified mail to the Owner and the Engineer/Architect prior to any material change or cancellation of said policies.

_________________________  _________________________
Named Insured (Contractor)  Insurance Company

_________________________  _________________________
Street Number  Street Number

_________________________  _________________________
City and State  City and State

By: ____________________________
     (Company Representative)

(SEE NOTICE ON PAGE 5 OF 5)
State of ____________________________  ss.  
County of ____________________________  

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

On ______________________________ before me, ____________________________________________  
Date  Here Insert Name and Title of the Officer  

Personally appeared ____________________________________________  
Name(s) of Signer(s)  

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

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

WITNESS my hand and official seal.

Company Agent for Service of Process in California:  

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
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<th>Street Number</th>
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<th>City and State</th>
<th>City and State</th>
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</table>

<table>
<thead>
<tr>
<th>Telephone Number</th>
<th>Telephone Number</th>
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</tbody>
</table>
NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
INSURANCE ENDORSEMENT

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: LIABILITY INSURANCE

This endorsement forms a part of Policy No.______________________________.

ENDORSEMENT:

The Owner, the Engineer/Architect, the Owner’s Representative, and their consultants, and each of their directors, officers, employees, and agents are included as additional insureds under said policies but only while acting in their capacity as such and only as respects operations of the named insured, his contractors, any subcontractor, any supplier, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable in the performance of the above-referenced contract. This insurance shall not apply if the loss or damage is ultimately determined to be the result of the sole and exclusive negligence (including any connected with the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications) of one or more of the aforesaid additional insureds. The insurance afforded to these additional insureds is primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of this insurance shall not be reduced or prorated by the existence of such other insurance.

The Contractual Liability Insurance afforded is sufficiently broad to insure all of the matters set forth in the article entitled "Indemnity" in the General Provisions of the above-referenced contract except those matters set forth in the third paragraph thereof.

This endorsement does not increase the Company's total limits of liability.

____________________________________  ______________________________________
Named Insured (Contractor)                Insurance Company
____________________________________  ______________________________________
Street Number                             Street Number
____________________________________  ______________________________________
City and State                            City and State

By: ______________________________________
(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)
State of ______________________________ ss.
County of ______________________________

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

On ______________________________ before me,_______________________________________________
Date  Here Insert Name and Title of the Officer

Personally appeared _____________________________________________________________________
Name(s) of Signer(s)

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

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

WITNESS my hand and official seal

________________________________________
NOTARY PUBLIC

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact form shall be provided for each policy.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
CERTIFICATE OF INSURANCE

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: BUILDERS’ RISK “ALL RISK” INSURANCE

THIS IS TO CERTIFY that the following policy has been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-4 of the General Provisions and is in force at this time:

<table>
<thead>
<tr>
<th>POLICY NUMBER</th>
<th>EXPIRATION DATE</th>
<th>LIMITS OF LIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Not Less Than Contract Amount)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deductible: $</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Not Sooner Than Contract Completion Date) (Not More Than $100,000)</td>
</tr>
</tbody>
</table>

This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term, or condition of any contract or other document with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.
The Company will give at least 30 days’ written notice by certified mail to the Owner and the Engineer/Architect prior to any material change or cancellation of said policy.

<table>
<thead>
<tr>
<th>Named Insured (Contractor)</th>
<th>Insurance Company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Street Number</td>
<td>Street Number</td>
</tr>
<tr>
<td>City and State</td>
<td>City and State</td>
</tr>
</tbody>
</table>

By: ________________________________  (Company Representative)

(SEE NOTICE ON PAGE 4 OF 4)
State of _____________________________  
County of _____________________________  

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

On ______________________________ before me, _____________________________________________

Date ______________________________________________________________________________

Here Insert Name and Title of the Officer

Personally appeared _________________________________________________________________

Name(s) of Signer(s)

____________________________________________________________________________________

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

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

WITNESS my hand and official seal

____________________________________________________________________________________

NOTARY PUBLIC

Insurance Company Agent for Service of Process in California:

_________________________________   ____________________________________________

Name   Agency

_________________________________   ____________________________________________

Street Number   Street Number

_________________________________   ____________________________________________

City and State   City and State

_________________________________   ____________________________________________

Telephone Number   Telephone Number
NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
INSURANCE ENDORSEMENT

Name of Contract: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT
Name of Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT
Type of Insurance: BUILDERS’ RISK “ALL RISK” INSURANCE

This endorsement forms a part of Policy No. ________________________________.

ENDORSEMENT:

The Owner, the Engineer/Architect, the Owner’s Representative, and their consultants, and each of their directors, officers, employees, and agents are included as additional insureds under said policy but only while acting in their capacity as such with respect to the above-referenced contract.

The insurance afforded to these additional insureds is primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of this insurance shall not be reduced or prorated by the existence of such other insurance.

This endorsement does not increase the Company's total limits of liability.

________________________________________  ______________________________________
Named Insured (Contractor)  Insurance Company

________________________________________  ______________________________________
Street Number  Street Number

________________________________________  ______________________________________
City and State  City and State

By: _____________________________________
(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)
State of ___________________________ ) ss.
County of ___________________________ )

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On ______________________________ before me, __________________________________________
Date _____________________________________________________________________________
Here Insert Name and Title of the Officer

Personally appeared ___________________________________________________________________
Name(s) of Signer(s)
____________________________________________________________________________________

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

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

WITNESS my hand and official seal

________________________________________
NOTARY PUBLIC

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<table>
<thead>
<tr>
<th>SECTION</th>
<th>ARTICLE</th>
<th>PAGE</th>
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<tbody>
<tr>
<td>1</td>
<td>DEFINITIONS, TERMS, AND ABBREVIATIONS</td>
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<td>DEFINITIONS</td>
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<td>PROPOSAL REQUIREMENTS AND CONDITIONS</td>
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<td>CONTRACT DOCUMENTS</td>
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<td>LICENSE AND BIDDER'S EXPERIENCE</td>
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<td>INTERPRETATION OF PLANS AND OTHER CONTRACT DOCUMENTS</td>
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<td>AWARD OF CONTRACT OR REJECTION OF BIDS</td>
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<td>FAILURE TO EXECUTE CONTRACT</td>
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<td>PLANS AND SPECIFICATIONS FURNISHED BY THE OWNER</td>
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<td>ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR</td>
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<td>STANDARDS, CODES, SAMPLES, AND TESTS</td>
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<td>TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY</td>
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<td>USE OF COMPLETED PORTIONS</td>
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<td>LEGAL RELATIONS AND RESPONSIBILITIES</td>
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<td>OBSERVING LAWS AND ORDINANCES</td>
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<td>RESPONSIBILITY FOR LOSS, DAMAGE, OR INJURIES</td>
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<td>CONTRACTOR'S RESPONSIBILITY FOR THE WORK</td>
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<td>PRESERVATION OF PROPERTY</td>
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<td>WARRANTY OF TITLE</td>
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<td>28</td>
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<td>TERMINATION FOR BREACH</td>
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<td>NOTICE AND SERVICE THEREOF</td>
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<td>PARTIAL INVALIDITY</td>
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<td>7-23</td>
<td>ATTORNEYS’ FEES</td>
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<td>LANDS AND Rights-OFF-WAY</td>
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<td>NO WAIVER OF Rights OR REMEDIES</td>
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<td>TAXES</td>
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<td>JURISDICTION AND VENUE</td>
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<td>HAZARDOUS WASTE</td>
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<td>EXCAVATIONS BELOW FOUR (4) FEET</td>
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<td>ARBITRATION</td>
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<td>8</td>
<td>CONTRACTOR’S INSURANCE</td>
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<td>GENERAL</td>
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<td>WORKERS’ COMPENSATION INSURANCE AND EMPLOYER’S LIABILITY INSURANCE</td>
<td>36</td>
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GENERAL PROVISIONS

SECTION 1 DEFINITIONS, TERMS, AND ABBREVIATIONS

1-1 DEFINITIONS

Whenever the following terms occur in the Contract Documents, the meaning shall be interpreted as follows:

ACCEPTANCE, FINAL ACCEPTANCE - The formal action by the Owner accepting the work as being complete.

ACCEPTED BID - The bid (proposal) accepted by the Owner.

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BIDDER - Any individual, partnership, corporation, joint venture, or other combination thereof submitting a proposal for the work contemplated, acting directly or through an authorized representative.

CALENDAR DAY - Means all days of the week including Saturdays, Sundays and Holidays with the first day counted being the first day following the date specified.

CONTRACT - The written agreement executed between the Owner and the Contractor covering the performance of the work.

CONTRACTOR - The individual, partnership, corporation, joint venture, or other combination thereof who has entered into the contract with the Owner for the performance of the work. The term "Contractor" means the Contractor or his authorized representative.

CONTRACT DOCUMENTS - The Contract Documents set forth in the Agreement; also any and all supplemental agreements amending or extending the work contemplated. Supplemental agreements are written agreements covering alterations, amendments, or extensions to the contract and include contract change orders.

DAYS - Unless otherwise specified, days shall mean calendar days.

ENGINEER/ARCHITECT – The term "Engineer/Architect" means the Engineer/Architect or his authorized representative.

OWNER - The public entity identified as such in the Agreement. The term "Owner" means the Owner or his authorized representative.

OWNER'S REPRESENTATIVE - The person or firm authorized by the Owner to represent it during the performance of the work by the Contractor. The term "Owner's Representative" means the Owner's Representative or his assistants.

PLANS, DRAWINGS - The Plans (drawings), or reproductions thereof, which show the location, character, dimensions, and details of the work to be done.
SPECIAL PROVISIONS - Additions, deletions, and changes to the General Provisions and Standard Specifications.

SPECIFICATIONS - The directions, provisions, and requirements contained in the General Provisions and Standard Specifications as supplemented by the Special Provisions.

STANDARD SPECIFICATIONS - The Contract Documents identified or referenced as such.

SUBCONTRACTOR - An individual, partnership, corporation, joint venture, or other combination thereof who has a contract with the Contractor to perform any of the work at the site. Subcontractor also means an individual, partnership, corporation, joint venture, or other combination thereof who has a contract with another subcontractor to perform any of the work at the site.

STANDARD DRAWINGS, STANDARD PLANS - That portion of the Plans identified or referenced as such.

UTILITY - Public or private fixed works for the transportation of fluids, gases, power, signals, or communications.

WORK - Any and all obligations, duties, and responsibilities necessary to complete the construction assigned to, or undertaken by, the Contractor pursuant to the Contract Documents including all materials, equipment, and supplies incorporated or to be incorporated in the construction. Also, the completed construction or parts thereof required to be provided under the Contract Documents.

1-2 TERMS

Wherever the terms "required," "permitted," "ordered," "designated," "directed," "prescribed," or terms of like import are used, it shall be understood that the requirements, permission, order, designation, direction, or prescription of the Owner's Representative is intended. Similarly, the terms "acceptable," "satisfactory," "or equal," or terms of like import shall mean acceptable to or satisfactory to the Owner's Representative, unless otherwise expressly stated. The word "provide" shall be understood to mean furnish and install.

1-3 ABBREVIATIONS

Wherever abbreviations are used, they shall have the meanings as set forth in the Special Provisions.

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 CONTRACT DOCUMENTS

The Contract Documents are set forth in the Agreement form and the definition of "Contract Documents" is in Article 1-1 DEFINITIONS.
2-2 LICENSE AND BIDDER'S EXPERIENCE

No bid will be accepted from a bidder who is not licensed to conduct business in the state of California and licensed to perform the class of work defined by the Contract Documents. All bidders shall complete the Bidder's Experience form as part of their bid. Bidders failing to complete and submit the Bidder's Experience form with their bid may be treated as nonresponsive at the option of the Owner. Bidders unable to demonstrate five (5) years of successful prior experience performing the type and magnitude of work required by this contract may also be rejected as nonresponsive.

2-3 PROPOSALS

Bids shall be made upon the Bid Form furnished by the Owner and a part of the Contract Documents. The Bid Form Checklist, Bid Form and Bid Bond must be submitted with the bid. All bids shall be properly executed and with all items filled in; the signatures of all persons signing shall be in longhand. Erasures, interlineations, or other corrections shall be authenticated by affixing in the margin immediately opposite the correction the initials of a person signing the bid. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures. If the unit price and the total amount named by a bidder for any item are not in agreement, the unit price alone shall be considered as representing the bidder's intention, and the totals shall be corrected to conform thereto.

Bids shall not contain any recapitulation of the work to be done. Alternative proposals will not be considered, except as called for. No oral, telegraphic, or telephonic proposals or modifications will be considered.

Bids shall be accompanied by a "Proposal Guarantee" in the form of a cashier's check, a certified check, or bidder's bond executed by an admitted surety insurer, in an amount not less than 10% of the amount of bid, and made payable to or for the benefit of the Owner. Said check, or bond shall be given as a guarantee that the bidder will enter into a contract and furnish the required bonds or substitutes and insurance certificates and endorsements if awarded the contract, and in case of refusal or failure to enter into said contract and furnish the required bonds or substitutes and insurance certificates and endorsements within 15 calendar days after notice of award by the Owner in writing, the cash or the check and the money represented by said check shall be forfeited to the Owner, or in the event that a bond is deposited, said security shall be forfeited. Forfeiture does not preclude the Owner from seeking all other remedies provided by law to recover losses sustained as a result of the Contractor's failure to enter into the contract or to furnish the required bonds or insurance certificates and endorsements.

Bids shall be sealed in an envelope marked and addressed as set forth in the Special Provisions. Bids shall be delivered to personnel of the Owner at the location designated in the Notice Inviting Sealed Proposals (Bids) on or before the day and hour set for the opening of bids. Bids not marked as being received by personnel of the Owner on or before the day and hour of bid opening will be rejected. It is the responsibility of the bidder to ensure that the bid is received by personnel of the Owner on or before the day and hour of bid opening.

2-4 WITHDRAWAL OF BID

A bidder may withdraw his bid by a signed written request any time prior to the day and hour for receiving bids designated in the Notice Inviting Sealed Proposals. Thereafter the Bid may be
withdrawn only as permitted in accordance with Public Contract Code Section 5100, et seq., regarding relief of Bidders.

The withdrawal of a bid does not prejudice the right of a bidder to file a new bid so long as the new bid is delivered as set forth in Article 2-3 PROPOSALS prior to the closing time specified for all bids.

2-5 BIDDERS INTERESTED IN MORE THAN ONE BID

No person, partnership, or corporation shall be allowed to make or file, or be interested in more than one bid for the work, unless alternative bids are called for. A person, partnership, or corporation submitting a subproposal to a bidder, or who has quoted prices on material to a bidder, is not thereby disqualified from submitting a subproposal or quoting prices to other bidders.

2-6 INTERPRETATION OF PLANS AND OTHER CONTRACT DOCUMENTS

If any person or entity contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the Plans, Specifications, or other Contract Documents, or finds discrepancies in, or omissions from the Plans and Specifications or other Contract Documents, he may submit to the Owner a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery prior to the last date/time noticed for prebid questions as stipulated in the Notice Inviting Sealed Proposals (Bids). An interpretation or correction of the Contract Documents will be made only by Addendum duly issued by the Owner. Notice of the availability of such Addendum will be electronically delivered (email) to each person or entity that has received a set of such documents. The Owner and the Engineer/Architect will not be responsible for any other explanation or interpretation of the documents.

2-7 ADDENDA

Addenda issued before the time in which to submit bids expires shall be included in the bid and shall be made a part of the contract.

2-8 EXISTING CONDITIONS AND EXAMINATION OF CONTRACT DOCUMENTS

The bidder represents that he has carefully examined the Contract Documents and the site where the work is to be performed and that he has familiarized himself with all local conditions and federal, state and local laws, ordinances, rules, and regulations that may affect in any manner the performance of the work. The bidder further represents that he has studied all surveys and investigation reports about subsurface and latent physical conditions pertaining to the jobsite, that he has performed such additional surveys and investigations as he deems necessary to complete the work at his bid price, and that he has correlated the results of all such data with the requirements of the Contract Documents. The submittal of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, including locality, uncertainty of weather and all other contingencies, and as to the character, quality, quantities, and scope of the work.

The Plans and Specifications for the work show subsurface conditions or otherwise hidden conditions as they are supposed or believed by the Engineer/Architect to exist; but it is not intended or to be inferred that the conditions as shown thereon constitute a representation that such conditions are actually existent. Except as otherwise specifically provided in the Contract Documents, the Owner, the Engineer/Architect, and their consultants shall not be liable for any
Where the Owner or the Engineer/Architect or their consultants have made investigations of subsurface conditions in areas where the work is to be performed, such investigations were made only for the purpose of study and design. The conditions indicated by such investigations apply only at the specific location of each boring or excavation at the time the borings or excavations were made. Where such investigations have been made, bidders or Contractors may inspect the records as to such investigations subject to and upon the conditions hereinafter set forth. The inspection of the records shall be made at the office of the Engineer/Architect.

The records of such investigations are not a part of the contract and are shown solely for the convenience of the bidder or Contractor. It is expressly understood and agreed that the Owner, the Engineer/Architect, and their consultants assume no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations; the records thereof; or of the interpretations set forth therein or made by the Owner's consultants, the Engineer/Architect or his consultants in the use thereof by the Engineer/Architect, and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions, densities, or other characteristics different from, those indicated may not be encountered.

When a log of test borings showing a record of the data obtained by the investigation of subsurface conditions by the Owner, the Engineer/Architect, or their consultants is included with the Plans or other documents, it is expressly understood and agreed that said log of test borings does not constitute a part of the contract, represents only the opinion of the Owner or the Engineer/Architect or their consultants as to the character of the materials encountered by them in the test borings, is included in the Plans or other documents only for the convenience of bidders, and its use is subject to all of the conditions and limitations set forth in this article.

The availability or use of information described in this article is not to be construed in any way as a waiver of the provisions of the first paragraph in this article and a bidder or Contractor is cautioned to make such independent investigations and examination as he deems necessary to satisfy himself as to conditions to be encountered in the performance of the work.

No information derived from such inspection of records of investigations or compilation thereof made by the Owner, the Engineer/Architect, or their consultants will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract nor entitle the Contractor to any additional compensation.

SECTION 3 AWARD AND EXECUTION OF CONTRACT

3-1 AWARD OF CONTRACT OR REJECTION OF BIDS

The award of the contract, if it be awarded, will be to the lowest responsible responsive bidder complying with the instructions contained in the Contract Documents. The Owner, however, reserves the right to select the schedules under which the bids are to be compared; to delete certain bid items from the Bid Schedule, to reject any and all bids, and to waive any irregularity in bids received. If, in the judgment of the Owner, a bid is unbalanced or if the bidder is not responsible, it shall be considered sufficient grounds for rejection of the entire bid.
The Owner shall have the period of time set forth in the Special Provisions after the opening of bids within which to accept or reject the bids. No bidder may withdraw his bid during said period. The Owner will return the proposal guarantees, except any guarantees which have been forfeited, and except bidders' bonds, to the respective bidders whose proposals they accompanied after the execution of the contract by the successful bidder or rejection of all bids or upon receipt of a written request therefor received after said period of time set forth in the Special Provisions. The proposal guarantee of the unsuccessful bidders will be returned by the Owner no later than 60 calendar days following the date of award of contract.

Before award of the contract, any bidder shall furnish upon request, proof of required insurance, a recent statement of his financial condition, and previous construction experience or such other evidence of his qualifications as may be requested by the Owner. If a bidder fails to furnish in a timely manner the information requested, it shall be considered sufficient grounds for rejection of such bidder's entire bid.

3-2 EXECUTION OF CONTRACT

The form of agreement, bonds, and other documents which the successful bidder, as Contractor, will be required to execute are included as a part of the Contract Documents.

The contract shall be signed by the successful bidder and returned to the Owner, together with the bonds or substitutes and insurance certificates and endorsements, within 15 calendar days or such additional time as may be allowed by the Owner from the date of the mailing of notice from the Owner to the bidder or from the date of personal delivery of notice from the Owner to the bidder that the agreement is ready for signature. The agreement, bonds or substitutes, insurance certificates and endorsements, and other documents to be executed by the Contractor shall be executed in original-triplicate, one each of which shall be filed with the Owner and one each with the Attorney for the Owner and the Contractor.

3-3 BONDS

The successful bidder, simultaneously with execution of the Contract Documents, shall either furnish a Payment Bond and Performance Bond each in an amount equal to 100% of the contract amount, or equivalent cash or securities in lieu of these bonds in accordance with Code of Civil Procedure Section 995.710. The failure of Contractor to make a written request to Owner to use alternative securities meeting the requirements of Code of Civil Procedure Section 995.710 at the time the Contract Documents are signed shall be deemed a waiver of the right of Contractor to subsequently substitute these alternative securities. Alternative securities proposed by the Contractor shall be subject to review and approval by Owner. Contractor agrees to provide Owner with a deposit in a sum determined adequate by the Owner to cover all attorney's fees and all other fees, costs, and expenses incurred by the Owner in reviewing Contractor's request to use alternative securities in lieu of the required bonds and to prepare all agreements determined necessary by Owner to adequately protect Owner's interest. Performance and Payment Bonds shall be furnished by surety companies meeting the requirements of Code of Civil Procedure Section 995.660(a) and shall be completed on the forms furnished as part of the Contract Documents. Surety companies, to be acceptable to Owner, must meet all requirements of Code of Civil Procedure Section 995.660(a).

If at any time a surety on any such bond fails to comply with Code of Civil Procedure Section 995.660(a), the Contractor shall, within 10 calendar days after notice from the Owner, substitute
new bonds with surety companies meeting all requirements of Code of Civil Procedure Section 995.660(a). All premiums on these new bonds shall be paid solely by the Contractor. No further progress payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished new bonds to Owner meeting all requirements of Code of Civil Procedure Section 995.660(a).

The Performance Bond and the Payment Bond, or alternative securities meeting the requirements of Code of Civil Procedure Section 995.710 approved by the Owner, must remain in full effect throughout the period of the Work and for a period of two-year thereafter as required by Article 5-14 TWO-YEAR GUARANTEE.

3-4 INSURANCE REQUIREMENTS

The successful bidder will be required to furnish the Owner proof of full compliance with all insurance requirements as specified in SECTION 8 CONTRACTOR'S INSURANCE. The forms of Certificate of Insurance and Endorsement which the successful bidder, as Contractor, will be required to furnish are included as a part of the Contract Documents.

3-5 FAILURE TO EXECUTE CONTRACT

Failure by a bidder to whom the contract is awarded to execute the contract or to furnish the required bonds or insurance certificates and endorsements within the period of time required by Section 3-2 Execution of Contract shall be just cause for the annulment of the award and the forfeiture of the proposal guarantee.

A bidder who is awarded the contract and fails to execute the contract or furnish the required bonds or substitutes, or insurance certificates and endorsements shall be liable to the Owner for all damages resulting therefrom including reasonable attorneys' fees. The proposal guarantee forfeited shall not be a limitation thereon.

SECTION 4 SCOPE OF WORK

4-1 WORK TO BE DONE

The work to be done consists of furnishing all transportation, labor, materials, tools, equipment, services, permits, utilities and all other items which are necessary or appurtenant to construct and complete the entire project and construct the project designated in the Contract Documents, and to leave the grounds in a neat and presentable condition.

4-2 CHANGES IN THE WORK

The Owner may require changes in, additions to, or deductions from the work, including complete termination thereof. Adjustment, if any, in the amounts to be paid to the Contractor by reason of any such change, addition, or deduction shall be determined as set forth in SECTION 9 ESTIMATES AND PAYMENTS.

The Owner's Representative may order minor changes in the work not involving an increase or decrease in the contract amount, not involving a change in the time for completion, and not inconsistent with the purposes for which the work is being constructed. If the Contractor believes that any order for minor changes in the work for which the contract amount or time for completion should be changed, he shall not proceed with the changes in the work so
ordered and shall within seven calendar days of the receipt of such order notify the Owner’s Representative in writing of his estimate of the changes in the contract amount and time for completion he believes to be appropriate.

No payment for changes in the work will be made and no changes in the time for completion by reason of changes in the work will be made, unless the changes are covered by a written change order approved by the Owner in advance of the Contractor’s proceeding with the changed work.

4-3 OBSTRUCTIONS

The Contractor shall remove and dispose of all structures, debris, or other obstructions of any character necessary to accommodate the work. Where such obstructions consist of improvements not required by law to be removed by the owner thereof, all such improvements shall be removed, maintained, and permanently replaced by the Contractor at his expense except as otherwise specifically provided in the Contract Documents.

4-4 UTILITIES

The Engineer/Architect has endeavored to determine the existence of utilities at the site of the work from the records of the owners of known utilities in the vicinity of the work. The positions of these utilities as derived from such records are shown on the Plans. The service connections to these utilities are not shown on the Plans.

The Contractor shall make his own investigations, including exploratory excavations, to determine the locations and type of existing service laterals or appurtenances when their presence can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the work. If the Contractor discovers utility facilities not identified in the Plans or Specifications or in a position different from that shown in the Plans and Specifications, he shall immediately notify in writing the Owner’s Representative and the owner of the utility facility.

The Owner shall have the responsibility for the timely removal, relocation, protection, and temporary maintenance of existing main or trunkline utility facilities which are not indicated in the Plans and Specifications with reasonable accuracy.

In case it should be necessary to remove, relocate, protect, or temporarily maintain a utility because of interference with the work, the work on such utility shall be performed and paid for as follows:

When it is necessary to remove, relocate, protect, or temporarily maintain an existing main or trunkline utility facility not indicated in the Plans and Specifications with reasonable accuracy, the Owner will compensate the Contractor for the costs of locating, for the costs of repairing damage not due to the failure of the Contractor to exercise reasonable care, for the costs of removing, relocating, protecting, or temporarily maintaining such utility facilities, and for the costs for equipment on the site necessarily idled during such work. These costs, the work to be done by the Contractor in locating, removing, relocating, protecting, or temporarily maintaining such utility facilities shall be covered by a written change order conforming to the provisions of Article 4-2 CHANGES IN THE WORK and Article 9-1 PAYMENT FOR CHANGES IN THE WORK. The Owner may make changes in the alignment and grade of the work to obviate the necessity to remove, relocate, protect, or temporarily maintain such utility facilities or to reduce the costs of the work involved in
removing, relocating, protecting, or temporarily maintaining such utility facilities. Changes in alignment and grade will be ordered in accordance with Article 4-2 CHANGES IN THE WORK.

When it is necessary to remove, relocate, protect, or temporarily maintain a utility (other than [1] existing main or trunkline utility facilities not indicated in the Plans and Specifications with reasonable accuracy, or [2] existing service laterals or appurtenances when their presence cannot be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the work) the cost of which is not required to be borne by the owner thereof, the Contractor shall bear all expenses incidental to the work on the utility or damage thereto. The work on the utility shall be done in a manner satisfactory to the owner thereof; it being understood that the owner of the utility has the option of doing such work with his own forces, or permitting the work to be done by the Contractor. No representations are made that the obligations to remove, relocate, protect, or temporarily maintain any utility and to pay the cost thereof is or is not required to be borne by the owner of such utility, and it shall be the responsibility of the Contractor to investigate to find out whether or not said cost is required to be borne by the owner of the utility.

The right is reserved to governmental agencies and to owners of utilities to enter at any time upon any street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the work and for the purpose of maintaining and making repairs to their property.

4-5 PLANS AND SPECIFICATIONS FURNISHED BY THE OWNER

The Owner will furnish to the Contractor free of charge up to five (5) full size copies of Plans and Specifications reasonably necessary for the execution of the work. The Contractor shall keep one set of Plans and Specifications in good order with red line changes available to the Owner's Representative at the site of the work.

4-6 FINAL CLEANUP

Upon completion and before making application for acceptance of the work, the Contractor shall clean all rights-of-way, streets, borrow pits, and all other grounds occupied by him in connection with the work of all rubbish, excess materials, temporary structures, and equipment, and all parts of the work and grounds occupied by him shall be left in a neat and presentable condition.

SECTION 5 QUALITY OF THE WORK

5-1 AUTHORITY OF THE OWNER'S REPRESENTATIVE

The Owner's Representative shall decide any and all questions which may arise as to the interpretation of the Plans and Specifications and shall have authority to disapprove or reject materials and equipment furnished and work performed which, in his opinion, is not in accordance with the Contract Documents. The Owner's Representative shall also have the authority to require the Contractor or any subcontractor to replace any workman or supervisor who, in his opinion, is not performing the work in a safe manner, fails to follow the instructions of the Owner's Representative, fails to perform work in accordance with the Contract Documents, fails to properly supervise the work, or demonstrates lack of competence to perform the particular work assigned to
the workman or supervisor. The failure of the Contractor or any subcontractor to replace a worker
or supervisor as directed by the Owner's Representative shall constitute a material breach of this
agreement. Neither the Owner's Representative nor the Owner shall be liable to Contractor, any
subcontractor, or any other person or entity for removing a workman or supervisor in accordance
with the terms of this article.

5-2 SUPPLEMENTAL DRAWINGS

The Plans shall be supplemented by such drawings as are necessary to better define the work. All
such drawings delivered to the Contractor by the Owner's Representative shall be deemed written
instructions to the Contractor. If the Contractor believes that any supplemental drawings call for
changes in the work for which the contract amount or time for completion should be changed, he
shall not proceed with the changes in the work so called for and shall within seven calendar days
of the receipt of the supplemental drawings notify the Owner's Representative in writing of his
estimate of the changes in the contract amount and time for completion he believes to be
appropriate.

No payment for changes in the work will be made and no change in the time for completion by
reason of changes in the work will be made, unless the changes are covered by a written change
order approved by the Owner in advance of the Contractor's proceeding with the changed work.

5-3 CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

The work shall conform to the lines, grades, dimensions, tolerances, and material and equipment
requirements shown on the Plans or set forth in the Specifications. Although measurement,
sampling, and testing may be considered evidence as to such conformity, the Owner's
Representative shall be the sole judge as to whether the work or materials deviate from the Plans
and Specifications, and his decision as to any allowable deviations therefrom shall be final.

If specific lines, grades, and dimensions are not shown on the Plans, those furnished by the
Owner's Representative shall govern.

5-4 MANUFACTURER'S INSTRUCTIONS

All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and
conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier,
or distributor, except as otherwise specifically provided in the Contract Documents.

5-5 COORDINATION OF PLANS AND SPECIFICATIONS

The Plans, Specifications, and other Contract Documents are essential parts of the contract, and a
requirement occurring in one is as binding as though occurring in all. They are intended to be
complementary and to describe and provide for the complete work. In the event of an apparent
difference between Plans and Specifications, reference shall be made to the Owner's
Representative whose decision thereon shall be final.

5-6  INTERPRETATION OF PLANS AND SPECIFICATIONS

Figured dimensions on drawings shall govern, but work not dimensioned shall be as directed. Work not particularly shown or specified shall be the same as similar parts that are shown or specified. Large-scale details shall take precedence over smaller scale drawings as to shape and details of construction. Specifications shall govern as to materials and workmanship. Plans and Specifications are intended to be fully complementary and to agree. The Specifications calling for the higher quality material or workmanship shall prevail. Materials or work described in words which so applied have a well known technical or trade meaning shall be deemed to refer to such recognized standards. In the event of any discrepancy between any drawings and the figures thereon, the figures shall be taken as correct. In the event of any doubt or question arising respecting the true meaning of the Plans or Specifications, reference shall be made to the Owner's Representative whose decision thereon shall be final.

5-7  ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR

It is the duty of the Contractor to promptly notify the Owner's Representative in writing of any design, materials, or specified method that the Contractor believes may prove defective or insufficient. If the Contractor believes that a defect or insufficiency exists in design, materials, or specified method and fails to promptly notify the Owner's Representative in writing of this belief, the Contractor waives any right to assert that defect or insufficiency in design, materials, or specified method at any later date in any legal or equitable proceeding against Owner, or in any subsequent mediation, arbitration, or settlement conference between the Owner and the Contractor. The Owner's Representative, on receipt of any such notice, will promptly investigate the circumstances and give appropriate instructions to the Contractor. Until such instructions are given, any work done by the Contractor after he comes to the belief that a defect or insufficiency exists in design, materials, or specified method which is directly or indirectly affected by such alleged defect or insufficiency in design, materials, or specified method will be at his own risk and he shall bear all cost arising therefrom.

If the Contractor, either before commencing work or in the course of the work, finds any discrepancy between the Plans and the Specifications or between either of them and the physical conditions at the site of the work or finds any error or omission in any of the Plans or in any survey, he shall promptly notify the Owner's Representative of such discrepancy, error, or omission. If the Contractor observes that any Plans or Specifications are at variance with any applicable law, ordinance, regulation, order, or decree, he shall promptly notify the Owner's Representative in writing of such conflict. The Owner's Representative, on receipt of any such notice, will promptly investigate the circumstances and give appropriate instructions to the Contractor. Until such instructions are given, any work done by the Contractor after his discovery of such error, discrepancy, or conflict which is directly or indirectly affected by such error, discrepancy, or conflict will be at his own risk and he shall bear all cost arising therefrom.

5-8  SUPERVISION AND SUPERINTENDENCE

The Contractor shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work in accordance with the Contract Documents.

The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but the Contractor shall not be solely responsible for the negligence of
others in the design or selection of a specific means, method, technique, sequence, or procedure of construction which is indicated in and required by the Contract Documents except as otherwise provided in Article 5-7 ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR.

The Contractor shall be responsible to see that the completed work complies with the Contract Documents.

The Contractor shall designate and keep on the work at all times during its progress a competent superintendent who shall not be replaced without written notice to the Owner's Representative. The superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor. During periods when the work is suspended, the Contractor shall make appropriate arrangements for any emergency work which may be required.

Whenever the superintendent is not present on any particular part of the work where the Owner's Representative may desire to inform the Contractor relative to interpretation of the Plans and Specifications or to the disapproval or rejection of materials or work performed, the Owner's Representative may so inform the foreman or other worker in charge of the particular part of the work in reference to which the information is given. Information so given shall be as binding as if given to the superintendent.

5-9 SHOP DRAWINGS

Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and which illustrates some portion of the work.

The Contractor shall review, mark with his approval, and submit for review by the Owner's Representative shop drawings as called for in the Special Provisions and Standard Specifications or requested by the Owner's Representative. Shop drawings shall be submitted by email as a PDF to the Owner's Representative and be accompanied by the Shop Drawing Submittal Form included at the end of the General Provisions. Shop drawings shall show the name of the project, the name of the Contractor, and, if any, the names of suppliers, manufacturers, and subcontractors. Shop drawings shall be submitted with promptness and in orderly sequence so as to cause no delay in prosecution of the work.

Shop drawings shall be complete in all respects. If the shop drawings show any deviations from the requirements of the Plans and Specifications because of standard shop practices or other reasons, the deviations and the reasons therefor shall be set forth in the Shop Drawing Submittal Form.

By submitting shop drawings, the Contractor represents that material, equipment, and other work shown thereon conforms to the Plans and Specifications, except for any deviations set forth in the Shop Drawing Submittal Form. A log shall be maintained by the Contractor showing the following information: sequential shop drawings number, brief description, date submitted, date approved, any other data relevant to the shop drawings.

Within 30 calendar days after receipt of said shop drawings, the Owner's Representative will return via electronic mail (email) the shop drawings to the Contractor with any comments noted thereon.
If so noted by the Owner's Representative, the Contractor shall correct the drawings and resubmit them in the same manner as specified for the original submittal. The Contractor, in the Shop Drawing Submittal Form accompanying resubmitted shop drawings, shall direct specific attention to revisions other than the corrections requested by the Owner's Representative on previous submittals.

The review by the Owner's Representative is only of general conformance with the design concept of the project and general compliance with the Plans and Specifications and shall not be construed as relieving the Contractor of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction of the work; the accuracy and completeness of the shop drawings; selecting fabrication processes and techniques of construction; and performing the work in a safe manner.

No portion of the work requiring a shop drawing submittal shall be commenced until the submittal has been reviewed by the Owner's Representative and returned to the Contractor with a notation indicating that resubmittal is not required.

If the Contractor believes that any shop drawing or communication relative thereto calls for changes in the work for which the contract amount or time for completion should be changed, he shall not proceed with the changes in the work so called for and shall within seven calendar days of the receipt of the shop drawings notify the Owner's Representative in writing of his estimates of the changes in the contract amount and time for completion he believes to be appropriate.

No payment for changes in the work will be made and no change in the time for completion by reason of changes in the work will be made, unless the changes are covered by a written change order approved by the Owner in advance of the Contractor's proceeding with the changed work.

5-10 QUALITY AND SAFETY OF MATERIALS AND EQUIPMENT

All equipment, materials, and supplies to be incorporated in the work shall be new, unless otherwise specified. All equipment, materials, and supplies shall be produced in a good and workmanlike manner. When the quality of a material, process, or article is not specifically set forth in the Plans and Specifications, the best available quality of the material, process, or article shall be provided.

Whenever any material, process, or article is indicated or specified by grade, patent or proprietary name, or by name of manufacturer, such Specification shall be deemed to be used for the purpose of facilitating description of the materials, process, or articles desired and shall be deemed to be followed by the words "or equal", and the Contractor may offer any material, process, or article which shall be substantially equal or better in every respect to that so indicated or specified; provided, however, that if the material, process, or article offered by the Contractor is not, in the opinion of the Owner's Representative, equal or better in every respect to that specified, then the Contractor must furnish the material, process, or article specified or one that in the opinion of the Owner's Representative is the substantial equal or better in every respect. In the event that the Contractor furnishes material, process, or article more expensive than that specified, the difference in cost of such material, process, or article so furnished shall be borne by the Contractor.
In accordance with Public Contract Code Section 3400, the Contractor shall submit data substantiating requests for substitution of "equal" items within 35 calendar days after award of the contract. This 35-day period of time is included in the number of days allowed for the completion of the work.

All materials, equipment, and supplies provided shall, without additional charge to Owner, fully conform with all applicable state and federal safety laws, rules, regulations, and orders, and it shall be Contractor's responsibility to provide only such materials, equipment, and supplies notwithstanding any omission in the Contract Documents therefor or that a particular material, equipment, or supply was specified.

All machinery and equipment provided by the Contractor for the work shall include locking mechanisms capable of locking any shut-down devices on the machinery and equipment before commencement of any repairs or other work. Any machinery or equipment provided by the Contractor, which does not have this locking ability, shall be altered at the expense of the Contractor to provide these locking mechanisms without compromising any safety features on the equipment or machinery prior to the commencement of any repairs or work on the equipment or machinery. The Contractor shall not commence any work or repairs on any machinery or equipment which has been shut down until the locking mechanism has been activated and the Contractor has tagged the applicable machinery or equipment with a tag stating "Danger Do Not Operate." This tag shall include the name of the employee who locked the equipment prior to the commencement of any work or repairs. The Contractor shall insure that all equipment and machinery fully complies with Title 8 of California Administrative Code Sections 3202, 3314, 6003, 2320.4-2320.6, 2530.43, and 2530-86 at all times during performance of the work.

5-11 STANDARDS, CODES, SAMPLES, AND TESTS

Whenever reference is made to a standard, code, Specification, or test and the designation representing the date of adoption or latest revision thereof is omitted, it shall mean the latest revision of such standard, code, Specification, or test in effect on the day the Notice Inviting Sealed Proposals (Bids) is dated.

Tests shall be made in accordance with commonly recognized procedures of technical organizations and such special procedures as may be prescribed elsewhere in the Plans and Specifications. The Contractor shall furnish without charge such samples for testing as may be required by the Owner's Representative.

5-12 OBSERVATION OF WORK BY OWNER'S REPRESENTATIVE

The Owner's Representative shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship, and character of materials and equipment used and employed in the work.

Whenever the Contractor varies the normal period during which work or any portion of it is carried on each day, he shall give timely notice to the Owner's Representative so that the Owner's Representative may, if he wishes, be present to observe the work in progress. If the Contractor fails to give such timely notice, any work done in the absence of the Owner's Representative will be subject to rejection. Any time spent by the Owner's Representative in the observation of work in progress that exceeds eight (8) hours in any single day shall be compensated back to the Owner by the Contractor at the Owner's fully loaded rate.
The Contractor shall give timely notice to the Owner's Representative in advance of backfilling or otherwise covering any part of the work so that the Owner's Representative may, if he wishes, observe such part of the work before it is concealed.

The observation, if any, by the Owner's Representative of the work shall not relieve the Contractor of any of his obligations to fulfill the contract as prescribed. Defective work shall be made good, and materials and equipment furnished and work performed which is not in accordance with the Contract Documents may be rejected notwithstanding the fact that such materials, equipment, and work have been previously observed by the Owner's Representative or that payment therefor has been included in an estimate for payment.

5-13 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

Any work which does not conform the requirements of the Contract Documents or which is found unacceptable or deficient by the Owner or the Owner’s Representative shall be remedied or removed and replaced by the Contractor at the Contractor’s sole cost and expense, together with any other work which may be displaced in so doing, and no compensation will be allowed the Contractor for such removal, replacement, or remedial work. All materials found inadequate or deficient by the Owner or the Owner’s Representative shall be immediately removed from the site.

Any work done beyond the lines and grades shown on the Plans or established by the Owner or any changes in, additions to, or deductions from the work done without written authority from the Owner will be considered as unauthorized and will not be paid for. Work so done will be ordered remedied, removed, or replaced by the Owner or the Owner’s Representative at the Contractor's sole cost and expense.

Upon failure on the part of Contractor to comply promptly with any order of the Owner or Owner’s Representative made under the provisions of this article the Owner or Owner’s Representative shall have authority to cause all non-conforming materials, rejected work, or unauthorized work to be remedied, removed, or replaced at the Contractor's sole cost and expense and to deduct all fees and costs incurred by the Owner including staff time from any monies due or to become due the Contractor under this contract.

5-14 TWO-YEAR GUARANTEE

Besides guarantees required elsewhere, the Contractor shall and hereby does guarantee all work, materials, parts, equipment and supplies to be free from all defects due to faulty materials or workmanship for a period of two-years after the date of formal acceptance of the work by the Board of Directors of Owner except for any portion of the work that is utilized or placed into service by the Owner in accordance with the provisions of Article 6-6 USE OF COMPLETED PORTIONS. The guarantee period for portions of the work so utilized or placed into service shall be two-years commencing on the date of the written notification to the Contractor described in Article 6-6 USE OF COMPLETED PORTIONS. The Contractor shall repair or remove and replace any and all such work, together with any other work which may be displaced in so doing, that is found to be defective by Owner in workmanship and/or materials, equipment, parts or supplies within the two-year period, at the Contractor’s sole cost and expense, ordinary wear and tear and unusual abuse or neglect excepted. In the event the Contractor fails to correct all defects identified by the Owner within seven (7) consecutive days after written notice of the defects from Owner, the Owner is hereby authorized to proceed to have the defects remedied and made good at the sole expense of the Contractor who hereby agrees to pay the cost and charges therefore immediately on demand.
Such action by the Owner will not relieve the Contractor of the guarantees required by this article or elsewhere in the Contract Documents.

The Performance Bond and the Payment Bond shall continue in full force and effect for the guarantee period.

If, in the opinion of the Owner, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the Owner or to prevent interruption of operations of the Owner, the Owner may require the Contractor to correct the defects in a shorter period of time determined solely by Owner. If the Contractor does not correct the defects within the time specified by Owner, Owner may proceed to make such corrections or provide such attention; and all fees and costs of such correction or attention shall be charged against the Contractor. Such action by the Owner will not relieve the Contractor of the guarantees required by this article or elsewhere in the Contract Documents.

This article does not in any way limit the guarantee on any items for which a longer guaranty is specified or on any items for which a manufacturer or supplier gives a guarantee for a longer period. The Contractor agrees to act as a co-guarantor with such manufacturer or supplier and shall furnish the Owner all appropriate guarantee or warranty certificates upon completion of the project. No guarantee period whether provided for in this article or elsewhere in this contract shall in any way limit the liability of the Contractor or his subcontractors, materialmen, suppliers, sureties or insurers for the full statutory periods provided by California law.

SECTION 6 PROSECUTION AND PROGRESS

6-1 CONTRACTOR’S LIABILITY

The Contractor shall be solely liable and responsible to the Owner for all acts and omissions of the Contractor’s directors, officers, agents, owners, and employees and for all acts and omissions of all subcontractors, materialmen and suppliers and their respective directors, officers, managers, members, agents, owners and employees performing any of the work or providing any materials or supplies included as part of the work. The Owner, the Engineer/Architect and the Owner's Representative shall not be liable in any way for any acts or omissions of the Contractor, any subcontractors, any materialmen, any suppliers, or any of their respective directors, officers, managers, members, agents, employees or owners. Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor materialman, or supplier and the Owner. The Contractor shall bind all subcontractors to all terms of the Contract Documents for all work being performed by those subcontractors.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the work among subcontractors.

6-2 ASSIGNMENT

The performance of the contract may not be assigned, except upon the written consent of the Owner. Consent will not be given to any proposed assignment which would relieve the original Contractor or his sureties or insurers of their responsibilities under the contract, nor will the Owner consent to any assignment of a part of the work under the contract.
Upon obtaining a prior written consent of the Owner, the Contractor may assign moneys due or to become due him under the contract, to the extent permitted by law, but any assignment of moneys shall be subject to all proper setoffs in favor of the Owner and to all deductions provided for in the contract, and particularly all money withheld, whether assigned or not, shall be subject to being used by the Owner for the completion of the work in the event that the Contractor should be in default therein.

No assignment of this contract will be approved unless it shall contain a provision that the funds to be paid to the assignee under the assignment are subject to a prior lien for services rendered or materials supplied for performance of the work called for under the contract in favor of all persons, firms, or corporations rendering such services or supplying such materials and that the Owner may withhold funds due until all work required by the Contract Documents is completed to the Owner's satisfaction.

In the event of bankruptcy of the Contractor, whether voluntary or involuntary, this Agreement may be automatically terminated at the election of the Owner. The election to terminate in accordance with this provision shall be deemed effective as of the date the Owner mails notice of termination in accordance with this section to the Contractor at the Contractor's last known address without any further action of any party. Upon termination in accordance with this provision, the Contractor shall be entitled to no further payments over and above the reasonable value of the actual Work completed as of the date the termination notice is mailed.

6-3 CONTRACTOR'S CONSTRUCTION SCHEDULE AND COST BREAKDOWN

Within fourteen (14) days after Notice to Proceed, the Contractor shall deliver to the Owner's Representative a construction progress schedule and cost breakdown in bar chart form showing the proposed dates of commencement and completion and cost of each of the various parts of the work and the anticipated amount of each monthly payment that will become due the Contractor in accordance therewith. The Owner shall be entitled to terminate this Contract if, in the Owner's opinion, the Contractor is failing to carry on the work diligently or in accordance with the approved construction schedule and breakdown. The Contractor has been advised and understands that time is of the essence with respect to completion of all phases of the work in accordance with the approved construction schedule.

6-4 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY

The Contractor shall complete all or any designated portion of the work called for under the contract within the time set forth in Special Provisions. Time is of the essence in this contract.

Failure of the Contractor to perform any covenant or condition contained in the Contract Documents within the time period specified shall constitute a material breach of this contract entitling the Owner to terminate the contract unless the Contractor applies for, and receives, an extension of time in accordance with the procedures set forth in this article and Article 6-5 EXTENSION OF TIME.

Failure of the Owner to insist upon the performance of any covenant or condition within the time period specified in the Contract Documents shall not constitute a waiver of the Contractor's duty to complete performance within the designated periods unless the waiver is in writing.
The Owner's agreement to waive a specific time provision or to extend the time for performance shall not constitute a waiver of any other time provisions contained in the Contract Documents. Failure of the Contractor to complete performance promptly within the additional time authorized in the waiver or extension of time agreement shall constitute a material breach of this contract entitling the Owner to terminate.

In accordance with Government Code 53069.85, Contractor agrees to forfeit and pay Owner the amount per day set forth in the Special Provisions for each and every day of delay which shall be deducted from any payments due or to become due the Contractor.

The Contractor shall not be deemed in breach of this contract and no forfeiture due to delay shall be made because of any delays in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor provided the Contractor requests an extension of time in accordance with the procedures set forth in this article and Article 6-5 EXTENSION OF TIME. Unforeseeable causes of delay beyond the control of Contractor shall include acts of God, acts of a public enemy, acts of the government, acts of the Owner, or acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather, or delays of subcontractors due to such causes, or delays caused by failure of the Owner or the owner of a utility to provide for removal or relocation of existing utility facilities. Delays caused by actions or neglect of Contractor or his agents, servants, employees, officers, subcontractors, directors, or of any party contracting to perform part or all of the work or to supply any equipment or materials shall not be excusable delays. Excusable delays (those beyond Contractor's control) shall not entitle the Contractor to any additional compensation. The sole remedy of the Contractor shall be to seek an extension of time.

6-5 EXTENSION OF TIME

The Contractor shall not be entitled to any increase in the contract price as a result of the Owner's approval of any extension of time except to the extent that the Owner approves an increase in the contract price on a properly executed Change Order.

The time specified for completion of all of the work or any part of the work may be extended only by a written change order executed by the Owner or other written form executed by the Owner.

Requests for an extension of time must be delivered to the Owner's Representative within ten consecutive calendar days following the date of the occurrence which caused the delay. The request must be submitted in writing and must state the cause of the delay, the date of the occurrence causing the delay, and the amount of additional time requested. Requests for extensions of time shall be supported by all evidence reasonably available or known to the Contractor which would support the extension of time requested. Requests for extensions of time failing to include the information specified in this article and requests for extensions of time which are not received within the time specified above shall result in the forfeiture of the Contractor's right to receive any extension of time requested.

If the Contractor is requesting an extension of time because of weather, he shall supply daily written reports to the Owner's Representative describing such weather and the work which could not be performed that day because of such weather or conditions resulting therefrom and which he otherwise would have performed.
The Owner's acceptance of the daily reports shall not be deemed an admission of the Contractor's right to receive an extension of time or a waiver of the Owner's right to strictly enforce the time provisions contained in the Contract Documents.

When the Contractor has submitted a request for an extension of time in accordance with the procedures of this article and Article 6-4 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY, the Owner will ascertain the facts and extent the delay and extend the time for completing the work if, in its judgment, the findings of fact justify such an extension, and its findings of facts thereon shall be final and conclusive. An extension of time may be granted by the Owner after the expiration of the time originally fixed in the contract or as previously extended, and the extension so granted shall be deemed to commence and be effective from the date of such expiration.

Any extension of time shall not release the sureties upon any bond required under the contract.

6-6 USE OF COMPLETED PORTIONS

When the work or any portion of it is sufficiently complete to be utilized or placed into service, the Owner shall have the right upon written notification to the Contractor to utilize such portions of the work and to place the operable portions into service and to operate same.

Upon said notice and commencement of utilization or operation by the Owner, the Contractor shall be relieved of the duty of maintaining the portions so utilized or placed into operation; provided, however, that nothing in this article shall be construed as relieving the Contractor of the full responsibility for completing the work in its entirety, for making good defective work and materials, for protecting the work from damage, and for being responsible for damage and for the work as set forth in the General Provisions and other Contract Documents nor shall such action by the Owner be deemed completion and acceptance, and such action shall not relieve the Contractor, his sureties, or insurers of the provisions of SECTION 8 CONTRACTOR'S INSURANCE, of Article 7-12 INDEMNITY, and of Article 5-14 TWO-YEAR GUARANTEE.

SECTION 7 LEGAL RELATIONS AND RESPONSIBILITIES

7-1 OBSERVING LAWS AND ORDINANCES

The Contractor shall keep himself fully informed of all existing and future laws, ordinances, and regulations which in any manner affect those engaged or employed to perform any of the work or providing any materials or supplies or which in any way affect the conduct of the work and of all statutes, laws, rules, regulations, orders, decisions, and decrees of any court or governmental agency having any jurisdiction or authority over all or any of the work or the conduct of the work, including all federal, state and local safety rules, regulations, and orders. This shall expressly include all ordinances, rules, regulations, and requirements applying to the work or the conduct of the work enacted by the Owner. If any discrepancy or inconsistency is discovered in the Plans, Specifications, or contract for the work the relation to any such law, rule, regulation, ordinance, order or decree, the Contractor shall forthwith report the same to the Owner's Representative in writing and cease operations on that part of the work until the Owner's Representative has given him appropriate instructions as provided for Article 5-7 ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR.

The Contractor shall at all times observe and comply with and shall cause all of his directors, officers, agents, managers, members, owners, employees, subcontractors, materialmen and
suppliers to observe and comply with all existing and future laws, ordinances, regulations, orders, and decrees, and shall hold harmless, indemnify, and defend the Owner, the Water Authority, the Engineer/Architect, the Owner’s Representative, and their consultants, and each of their directors, officers, employees, and agents from and against any and all liability, claims, causes of action, damages, losses, claim fees and costs, staff time, expenses, fees, and costs, including all costs of defense and attorneys’ fees, arising from or based on the violation any such law, ordinance, regulation, order, or decree by the Contractor, any subcontractor, any materialman or supplier or any of their respective directors, officers, agents, managers, members, owners, or employees.

7-2 PERMITS AND LICENSES

The Contractor shall be solely liable and responsible for securing all permits and licenses necessary to perform all of the work, for paying all fees and charges necessary to secure any such permit, license, or approval, and for giving all notices which are appropriate or necessary to the proper and safe prosecution of the work. The Owner shall have no obligation to procure any permit, license, or approval necessary to perform all or any portion of the work. The Contractor shall also be solely liable and responsible for fully complying with all requirements of any permits, licenses or approvals pertaining to all or any of the work. The failure of Contractor to strictly comply with all requirements of any permits, licenses, or approvals applying to all or any of the work shall constitute a material breach of the contract.

7-3 INVENTIONS, PATENTS, AND COPYRIGHTS

The Contractor shall pay all royalties and assume all costs arising from the use of any invention, design, process, materials, equipment, product, or device which is the subject of patent rights or copyrights.

The Contractor shall hold harmless, indemnify, and defend the Owner, the Water Authority, the Engineer/Architect, the Owner’s Representative, and their consultants, and each of their directors, officers, employees, and agents from and against all claims, damages, losses, expenses, and other costs, including costs of defense and attorneys’ fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, materials, equipment, product or device, and shall defend all such claims in connection with any alleged infringement of such rights.

7-4 PUBLIC CONVENIENCE AND SAFETY

The Contractor shall conduct his operations at all times in a manner that creates the least possible obstruction and inconvenience to the public, and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public and all property owners in the area of the work. The Contractor shall be solely liable and responsible for ensuring that all of the work is conducted at all times in a safe manner that does not injure or damage any workers, members of the public or private or public property.

Convenient access to driveways, houses, and buildings along the line of work shall be maintained and temporary crossings shall be provided and maintained in good condition at all times during performance of the work. Not more than one crossing or intersecting street or road shall be closed at any one time.
The Contractor shall provide and maintain such fences, barriers, directional signs, lights, and flagmen as are necessary to give adequate warning to the public at all times of any conditions to be encountered as a result of the work and to give directions to the public. The Contractor shall ensure that all unsafe conditions created by the work are promptly remedied and that any unsafe conditions created by the work are protected by barriers, safeguards and warnings preventing vehicular, bicycle or walking access in any unsafe areas.

It shall also be the sole responsibility of the Contractor to ensure that the work is performed at all times in a manner that does not injure or harm any person or injure or damage any real or personal property of any person or entity.

The Contractor shall perform the work only the areas expressly identified on the drawings. The Contractor must operate entirely within the limits of the project site. No equipment or materials may be parked, stockpiled, or stored outside the project site or designated Contractor staging areas. The Contractor shall not enter onto, occupy, or disturb any privately owned land or any public or private habitat not scheduled for removal in the approved plans with any men, tools, materials, dirt, or equipment except with the prior express written consent of the Owner and all owners of any privately-owned land. The Contractor has been advised, and understands, that any request to enter onto, occupy, or disturb any privately-owned land or habitat must be submitted to the General Manager of the Owner for written approval prior to entering onto, occupying, or disturbing any privately-owned land or public or private habitat for any purpose. The violation of this section by Contractor shall constitute a material breach of this contract.

The Contractor and any subcontractors, materialmen, or suppliers shall not, at any time, conduct any of the work in any manner that creates any public or private nuisance or trespass on the land of any private party or public agency. It shall be the sole responsibility of Contractor to conduct the work at all times in a manner that avoids creating any nuisance or trespass on any real or personal property owned by any private party or public agency.

The Contractor hereby agrees to indemnify, defend, and hold harmless the Owner, the San Elijo Joint Powers Authority, City of Encinitas, Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents from and against any and all liability, claims, causes of action, actions, damages, losses, fees, costs, or expenses, of whatever type or nature, including all costs of defense, attorneys' fees, and claim fees or costs, arising out of or resulting from performance of any of the work by the Contractor, its subcontractors, materialmen, or suppliers, or their respective directors, officers, agents, managers, members, owners, or employees which results in any injury or damage to persons or property including wrongful death regardless of whether or not such claim, cause of action, damage, loss or expense is caused in whole or in part by the negligence, active or passive, of Owner, the Engineer/Architect, or the Owner's Representative excepting only those claims and causes of action caused by the sole active negligence or intentional misconduct of the Owner, the Engineer/Architect, or the Owner's Representative. From and after the date of submission of any claim or demand to Owner, the indemnified parties shall recover from the Contractor all attorneys fees, expert fees and costs, claim costs, and staff time involved in handling the claim or any subsequent action on the claim at the standard hourly rates for staff handling the claim or action.

7-5 RESPONSIBILITY FOR LOSS, DAMAGE, OR INJURIES

The Contractor shall be solely responsible for all liability, claims, causes of action, demands, losses, costs, fees, expenses, and damages, of whatever type or nature, from any cause arising
out of or resulting from or in connection with the performance of any of the work, excepting only those claims and causes of action caused solely and exclusively by the active negligence or intentional misconduct of the Owner, the Engineer/Architect, the Owner’s Representative, or their consultants, directors, officers, employees, and agents. This exclusive responsibility shall extend to all liability, claims, causes of action, demands, losses, costs, fees, and expenses, of whatever type or nature, after completion of the work as well as during the progress of the work.

In the event any hazardous or toxic materials, including but not limited to asbestos, are utilized in construction or hazardous or toxic materials are otherwise encountered during construction, the Contractor shall take all appropriate precautions to protect persons and property and shall comply with all applicable regulations for the installation and handling of such hazardous or toxic materials. The Contractor is solely responsible for protection of all persons and property that could be affected by any construction or work and for the proper handling and disposal of all such hazardous or toxic materials.

Contractor has been advised that the Owner has Safety Data Sheets (hereinafter “SDS”) available for review on any hazardous chemical they may be exposed to while working in or around Owner facilities. It shall be the sole responsibility of Contractor to request and inspect these SDS forms prior to commencement of any work and to alert all employees and agents of Contractor of potential hazardous waste exposure from Owner facilities. It shall be the sole responsibility of Contractor to provide the Owner’s Representative with completed SDS forms for all hazardous or toxic substances that the Contractor utilizes as part of the work prior to the use of any hazardous or toxic substances and to provide these SDS forms to the Contractor’s agents and employees prior to their exposure to any hazardous or toxic substance utilized by the Contractor. Further, Contractor shall comply with all provisions contained in General Industry Safety Orders Section 5194 of Title 8 of the California Administrative Code (the California Hazardous Communication Regulation) at all times during performance of the work.

7-6 CONTRACTOR’S RESPONSIBILITY FOR THE WORK

Until formal acceptance of the work by action of the Board of Directors of Owner, the Contractor shall be solely liable and responsible for all aspects of the work and all equipment materials and supplies to be provided as part of the work (including materials for which he has received partial payment or materials which have been furnished by the Owner) and shall bear the sole risk of injury, loss, or damage to any of the work, or any materials, supplies, or equipment being used or provided in conjunction with the work from any act of nature or the elements and from all other causes, whether arising from the execution or from the non-execution of the work.

The Contractor, at the Contractor’s sole cost and expense, shall rebuild, repair, restore, and make good all injuries, losses, or damages whatsoever to any portion of the work or to any materials, equipment, or supplies from any cause before completion and formal acceptance of the work by formal action of the Board of Directors of Owner and shall solely bear the expense thereof. Where the Owner or the Owner’s Representative determines it is necessary to protect the work or materials from any damage or injury, the Contractor shall at his sole expense provide suitable drainage and erect any additional structures and take all additional protective actions determined necessary or appropriate by either the Owner or the Owner’s Representative to protect the work or materials from further damage or injury. The suspension of the work or the granting of an extension of time from any cause whatsoever shall not relieve the Contractor of his sole responsibility for the work, materials, or equipment as specified herein.
In an emergency affecting the safety of life or property, including any adjoining property, the Contractor, without special instructions or authorizations, shall promptly act to prevent such threatened loss or injury. The Contractor shall also promptly implement any and all directions given by the Owner or the Owner's Representative to protect the safety of life or property during any emergency as determined by Owner.

Notwithstanding the foregoing provisions of this section, the Contractor shall not be responsible for the cost of repairing or restoring damage to the work where the damage has been determined to have been caused solely by an Act of God in excess of 5% of the contract and amount provided that the work damaged is built in accordance with accepted and applicable building standards and in strict compliance with the Plans and Specifications. For the purpose of this paragraph, “Acts of God” shall include only earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves. No other actions of the elements, nature, or man shall be treated as Acts of God under this paragraph.

7-7 PRESERVATION OF PROPERTY

The Contractor shall be solely liable and responsible for avoiding injury or damage or interfering with the construction or operation of any and all existing improvements or facilities, all utility facilities, all personal and real property whether owned by any public agency or private party, and any and all trees, shrubbery, landscaping and habitat that are not to be removed. The Contractor shall be solely liable and responsible for any and all damage and injury to any real or personal property of any person or entity both during and after performance of the work.

All trees, shrubbery, and landscaping that are not to be removed, and all lines, fences, signs, survey markers and monuments, buildings and structures, conduits, pipelines both under or above ground, all sewer and water pipelines or facilities, all highway or street facilities, and any and all other improvements, facilities, habitat, trees, or landscaping within or adjacent to the work not to be removed in the approved plans shall be protected by the Contractor from all injury or damage and the Contractor shall provide and install suitable safeguards to protect all such objects from any injury or damage. If any of the foregoing objects are injured or damaged either during or after performance of the work, they shall be promptly replaced or restored to a condition as good as when the Contractor commenced work or as good as required by the Plans and Specifications if any such objects or are part of the work being performed, at the Contractors sole cost and expense. The Owner, the Engineer/Architect and the Owners Representative and their respective Directors, officers, agents and employees shall have no liability whatsoever for any injury or damage caused in whole or in part by the actions or omissions of the Contractor, any subcontractor, any materialmen or supplier, or any of their respective directors, officers, agents, employees, managers, or members except where the injury or damage is caused by the sole and exclusive active negligence or intentional misconduct of the Owner, the Engineer/Architect, the Owners Representative, or their consultants, directors, officers, employees, and agents. The Contractor shall also be solely liable and responsible for any and all damage or injury to any landscaping or habitat caused in whole or in part by the actions or omissions of the Contractor, any subcontractor, any materialmen or supplier, or their respective directors, officers, agents, employees, managers, owners, or members.

The fact that any pipeline or other underground facility is not shown on the Plans, shall not relieve the Contractor of his responsibility under this section.
In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect all foundations, structures, or improvements adjacent to or adjoining the site of the work which are in any way affected by the excavations or by any of the work. Whenever any notice is required to be given by the Owner or the Contractor at any adjacent or adjoining landowner or other party before commencement of any work, this notice shall be given by the Contractor.

7-8 REGIONAL NOTIFICATION CENTER CONTACT

The Contractor, except in an emergency, shall contact the appropriate regional notification center prior to commencing any excavation work. Notify the center at least two working days in advance or up to a maximum of 14 calendar days in advance of any excavation work. The Contractor shall delineate the proposed excavation site with white paint on paved surfaces or with markings such as flags or stakes in unpaved areas. The Contractor shall provide the regional notification center with all job site location information. The regional notification center will assign to the Contractor a Dig Alert Number which validates the Contractor’s excavation permit and will notify all of its members having subsurface installations in the area. No excavation shall be commenced and carried out by the Contractor until all existing subsurface installations have been field marked and the Owner has been given the Dig Alert Number by the Contractor.

Emergency shall be defined as a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. Emergency includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage (Government Code Section 4216).

Subsurface installation means any underground pipeline, conduit, duct, wire, or other structure operated or maintained in or across a public street or public right-of-way (Government Code Section 4216).

7-9 EXCAVATION PLANS FOR WORKER PROTECTION REQUIRED BY LABOR CODE SECTION 6705

If the total amount of the contract is in excess of $25,000, the Contractor shall submit to the Owner for acceptance, in advance of excavation, a detailed Plans showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches 5 feet or more in depth. The Plans shall be prepared by a registered civil or structural engineer. As a part of the Plans, a note shall be included stating that the registered civil or structural engineer certifies that the Plans comply with all CAL-OSHA Construction Safety Orders and regulations, or that the registered civil or structural engineer certifies that the Plans is not less effective than the shoring, bracing, sloping, or other provisions of the Safety Orders and regulations.

The Owner or the Engineer/Architect or their consultants may have made investigations of subsurface conditions in areas where the work is to be performed. If so, these investigations are identified in the Special Provisions and the records of such investigations are available for inspection at the office of the Engineer/Architect. The detailed Plans showing the design of shoring, etc., which the Contractor is required to submit to the Owner for acceptance in advance of excavation will not be accepted by the Owner if the Plans are based on subsurface conditions which are more favorable than those revealed by the investigations made by the Owner or the
Engineer/Architect or their consultants; nor will the Plans be accepted if it is based on soils-related design criteria which is less restrictive than the criteria set forth in the report on the aforesaid investigations of subsurface conditions.

The detailed Plans showing the design of shoring, etc., shall include surcharge loads for nearby embankments and structures, for spoil banks, and for construction equipment and other construction loadings.

The Plans shall indicate for all trench conditions the minimum horizontal distances from the side of the trench at its top to the near side of the surcharge loads.

Nothing contained in this article shall be construed as relieving the Contractor of the full responsibility for providing shoring, bracing, sloping, or other provisions which are adequate for worker protection.

7-10 SAFETY

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the work, and the Contractor shall fully comply with all state, federal and other laws, rules, regulations, and orders relating to safety of the public and workers.

The right of the Engineer/Architect or the Owner's Representative to conduct construction review or observation of the Contractor's performance will not include review or observation of the adequacy of the Contractor's safety measures in, on, or near the construction site.

7-11 PERSONAL LIABILITY

No director, officer, employee, or agent of the Owner, the Engineer/Architect, the Owner's Representative, or their consultants shall be personally responsible for any liability arising under or by virtue of the contract.

7-12 DEFENSE AND INDEMNITY

The Contractor hereby agrees to indemnify, defend, and hold harmless the Owner, the Engineer/Architect, and the Owner's Representative and their respective directors, officers, agents, employees and consultants from and against any and all liability, claims, demands, causes of action, actions, damages, losses, fees, costs, or expenses, of whatever type or nature, including all costs of defense and attorneys’ fees, caused in whole or in part, or claimed to be caused in whole or in part, by any act or omission of the Contractor, any subcontractor, any supplier or materialman or any of their respective directors, officers, agents, employees, managers, members, or owners except only those claims and causes of action caused by the sole active negligence or intentional misconduct of the Owner, the Engineer/Architect or the Owner's Representative or their respective agents or employees. This indemnification shall extend to all claims, demands, causes of action, actions, or liability occurring after completion of the project as well as during the progress of the Work.

The Contractor further agrees to indemnify, defend, and hold harmless the Owner, the Engineer/Architect, and Owner's Representative and their respective directors, officers, agents, employees, and consultants from and against any and all liability, claims, causes of action, actions, losses, fees, costs, expenses, or damages, of whatever type or nature, including all costs of
defense and attorneys’ fees, as a result of the failure of or claimed failure of the Contractor to strictly comply with any of the Contractor’s obligations under this contract. This indemnity shall expressly include claims by the Owner for any injury, damages, losses, costs, fees or expenses arising from or related to the failure of the Contractor or any of his subcontractors, materialmen, or suppliers to strictly comply with all terms of this contract or as a result of any improper workmanship or defective supplies or materials.

The Contractor’s indemnity obligations as contained in this section shall remain in full force and effect and shall apply whether or not the claim, cause of action, damage, cost, fee, or expense is covered by any applicable insurance policy and regardless of any position that may be taken by any insurance company regarding a defense or coverage for any claim or cause of action asserted. From and after the date any claim or demand is submitted to Owner covered by these indemnity provisions, the indemnified parties shall be entitled to recover from Contractor all fees and costs incurred in investigating the claim, all staff time involved in handling the claim or any subsequent action on the claim at staff’s ordinary hourly rates, all expert fees and costs, all attorneys’ fees, and all court costs. The Contractor shall also be solely liable and responsible for paying any and all damages, fees or costs awarded to the claimant as a result of any settlement or final judgment of any cause of action or action covered by these indemnity provisions. This indemnity shall expressly include all wrongful death actions as well as any actions asserting any damage or injury to any persons or real or personal property.

From and after submission of any claim or demand to any of the indemnified parties, the indemnified party shall be entitled to appoint their own independent counsel to represent them and the Contractor shall pay all fees, costs, and expenses of whatever type or nature (including all staff time) incurred by each of the indemnified parties within thirty (30) consecutive days of receipt of a demand for reimbursement of these costs, fees, or expenses by each of the indemnified parties. A breach of this indemnity provision by Contractor shall constitute a material breach of the contract.

7-13 HOURS OF LABOR

The Contractor shall forfeit as a penalty to the Owner $25 for each worker employed in the execution of the contract by the Contractor or any subcontractor under him for each calendar day during which such worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code and, in particular, Section 1810 to Section 1815 thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day and 40 hours during any one week shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay as provided in said Section 1815.

7-14 PREVAILING WAGE

The Contractor shall comply with Labor Code Section 1775. In accordance with said Section 1775, the Contractor shall forfeit as a penalty to the Owner $50 for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed for any work done under the contract by him or her or by any subcontractor under him or her in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor. Pursuant to Labor Code
Section 1775, to the extent there is insufficient money due a contractor to cover all penalties forfeited and amounts due, the Division of Labor Standards Enforcement shall be notified of the violation and the Division of Labor Standards Enforcement shall be entitled to maintain an action in any court of competent jurisdiction to recover the penalties and the amounts due pursuant to Labor Code Section 1775.

Section 1776 of the Labor Code requires each contractor and its subcontractors to keep accurate payroll records showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the work required by these Contract Documents. These payroll records shall be made available for inspection or furnished to all employees, any representative of the Owner, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations. Contractor shall provide a certified copy of these payroll records to any of the aforementioned parties within 10 calendar days after receipt of a written request for these records. Contractor understands that it is the responsibility of the Contractor to ensure that these payroll records are maintained by Contractor and all subcontractors performing the work in accordance with Labor Code Section 1776(h). The payroll records shall be on forms provided by the Division of Labor Standard Enforcement or provide the same information as the information required by this form.

Pursuant to Labor Code Section 1777.1, whenever any contractor or subcontractor performing a public works project is found by the Labor Commissioner or the Owner to be in violation of Labor Code Section 1770 et seq., except Section 1775, the contractor or subcontractor or any firm, corporation, partnership, or association of which the contractor or any subcontractor has a substantial interest, shall be ineligible to bid on or to receive any public works contract for a period of not less than one-year or more than three years. The period of debarment shall run from the date the determination of the violation is made by the Labor Commissioner.

The Owner shall be entitled to withhold wages and penalties due as a result of any violation of the Labor Code from Payments due the Contractor in accordance with Labor Code Section 1726. These withheld amounts shall be paid to the Labor Commissioner for disbursement in accordance with Labor Code Section 1730. The Contractor’s right to recover these wages and penalties shall be limited as provided in the Labor Code.

7-15 TRAVEL AND SUBSISTENCE PAYMENTS

Each worker needed to execute the work must be paid travel and subsistence payments as defined in the applicable collective bargaining agreements filed in accordance with Labor Code Section 1773.8.

7-16 APPRENTICES

Attention is directed to the provisions in Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under him.

The Contractor and any subcontractor under him shall comply with the requirements of Sections 1777.5 and 1777.6 of the Labor Code in the employment of apprentices.
Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

Willful violations of Section 1777.5 will result in the Contractor, and the business entity under which the Contractor is doing business, being denied the right to bid on, or to receive, any public works contract for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violations commencing from the date the determination of noncompliance by the Administrator of Apprenticeship Council. In addition, if the Contractor violates Section 1777.5, he will forfeit as a civil penalty the sum of $50 for each calendar day of non-compliance which shall be withheld from progress payments by Owner upon notice from the Department of Industrial Relations. (Labor Code Section 1777.7.)

7-17 WARRANTY OF TITLE

No materials, supplies, or equipment for the work under this contract shall be purchased subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants clear and good title to all materials, supplies, and equipment installed and incorporated in the work and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens, encumbrances, or charges and further agrees that neither he nor any person, firm, or corporation furnishing any material or labor for any work covered by the contract shall have any right to a lien upon the premises or any improvement or appurtenance thereon, provided that this shall not preclude the Contractor from installing metering devices or other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality. Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any right under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this article shall be inserted in all subcontracts and material contracts, and notices of its provision shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

7-18 PROPERTY RIGHTS IN MATERIALS

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil. All such materials shall become the property of the Owner upon being so attached or affixed. Soil, stone, gravel, and other materials found at the site of the work and which conform to the Plans and Specifications for incorporation into the work may be used in the work. No other use shall be made of such materials except as may be otherwise described in the Plans and Specifications.

7-19 MUTUAL RESPONSIBILITY OF CONTRACTORS

Nothing in the contract shall be interpreted as granting to the Contractor exclusive occupancy of the site of the project. The Contractor must ascertain to his own satisfaction the scope of the
project and the nature of any other contracts that have been or may be awarded by the Owner in the construction of the project, to the end that the Contractor may perform this contract in the light of such other contracts, if any.

The Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the project. If the performance of any contract for the project is likely to be interfered with by the simultaneous performance of some other contract or contracts, the Owner's Representative shall decide which contractor shall cease work temporarily and which contractor shall continue or whether the work under the contracts can be coordinated so that the contractors may proceed simultaneously. On all questions concerning conflicting interest of contractors performing related work, the decision of the Owner's Representative shall be binding upon all contractors concerned and the Owner, the Engineer/Architect, the Owner's Representative, and their consultants shall not be responsible for any damages suffered or extra costs incurred by the Contractor resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the project or caused by a decision or omission of the Owner's Representative respecting the order of precedence in the performance of the contracts.

If through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration, if such other contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the Owner, the Engineer/Architect, the Owner's Representative, or their consultants or any of their directors, officers, employees, or agents on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall hold harmless, indemnify, and defend the Owner, the San Elijo Joint Powers Authority, City of Encinitas, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents against any such claim, including all attorneys' fees and any other costs incurred by the indemnified parties relative to any such claim.

7-20 TERMINATION FOR BREACH

If the Contractor refuses or fails to prosecute the work or any separable part thereof with such diligence as will ensure its completion within the time specified herein, or any extension thereof, or fails to complete such work within such time, or if the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he files a petition to take advantage of any debtor's act, or if he or any of his subcontractors should violate any of the provisions of the contract, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials to complete the work in the time specified, or if he should fail to make prompt payment to subcontractors or for material or labor, or if he should persistently disregard laws, ordinances, or instructions given by the Owner or Owner's Representative, the Owner may, without prejudice to any other right or remedy, serve written notice upon the Contractor and his surety of his intention to terminate the contract, said notice to contain the reasons for such intention to terminate the contract, and unless within ten days after the service of such notice such violations shall cease and satisfactory arrangements for the corrections thereof be made, the contract shall upon the expiration of said ten days cease and terminate. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished.
In the event of any such termination, the Owner shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract; provided, however, that if the surety within 15 calendar days after the serving upon it of a notice of termination does not give the Owner written notice of its intention to take over and perform the contract or does not commence performance thereof within 30 calendar days from the date of serving said notice, the Owner may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor, and his surety shall be liable to the Owner for any excess cost or other damage occasioned the Owner thereby, and in such event the Owner may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plants, and other property belonging to the Contractor that may be on the site of the work and be necessary therefor. For any portion of such work that the Owner elects to complete by furnishing its own employees, materials, tools, and equipment, the Owner shall be compensated for such in accordance with the schedule of compensation for force account work in Article 9-1 PAYMENT FOR CHANGES IN THE WORK.

If the unpaid balance of the contract price exceeds the direct and indirect costs of completing the work, including, but not limited to, all costs to Owner arising from professional services and attorneys' fees and all costs generated to insure or bond the work of substituted contractors or subcontractors utilized to complete the work, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner promptly upon demand; on failure of Contractor to pay, the surety shall pay on demand by Owner. Any portion of such difference not paid by Contractor or surety within 30 calendar days following the mailing of a demand for such costs by Owner shall earn interest at the rate of 10% per annum or the maximum rate authorized by California law, whichever is lower.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the Owner.

7-21 NOTICE AND SERVICE THEREOF

Any notice required or given under the contract shall be in writing, be dated, and signed by the party giving such notice or his duly authorized representative, and be served as follows:

If to the Owner, by personal delivery or by deposit in the United States mail.

If to the Contractor, by personal delivery to the Contractor or to his authorized representative at the site of the project or by deposit in the United States mail.

If to the surety or any other person, by personal delivery to said surety or other person or by deposit in the United States mail.

All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid, and shall be addressed to the addresses in the Contract Documents or such substitute addresses which a party designates in writing and serves as set forth herein.

7-22 PARTIAL INVALIDITY

If any provision of this contract is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way.
ATTORNEYS' FEES

In the event any arbitration proceeding, administrative proceeding or litigation in law or in equity, including an action for declaratory relief, is brought to invalidate, enforce, or interpret any term or provision of this contract, the prevailing party shall recover all attorneys' fees, all expert fees and costs, and all costs of the proceeding which shall be determined by the Court or the presiding officer at the proceeding authorized to make a determination of the issues or in a separate action brought for that purpose, in addition to any other relief provided by California law.

If any party to this agreement becomes a party to any litigation, administrative proceeding or arbitration concerning the invalidation, enforcement or interpretation of the provisions of this agreement or the performance of this agreement by reason of any act or omission of another party or authorized representative of another party to this agreement and not by any act or omission of a party that becomes a party to that proceeding or any act or omission of its authorized representatives, the party that causes another party to become involved in the proceeding shall be liable to that party for all expert fees and costs, all attorneys' fees, and all costs of the proceeding. The award of these expert fees and costs, attorneys' fees, and costs shall be determined as provided above.

From and after any date of submission of any demand or claim to Owner or any of the other indemnified parties covered by any indemnity provisions of this contract, the indemnified party shall be entitled to appoint their own independent counsel to represent them and the Contractor shall pay all fees and costs incurred by the indemnified parties to investigate and evaluate the claim or cause of action, for all staff time at the hourly rates of each staff member handling the claim or cause of action, all attorneys' fees, all expert fees and costs, and all court costs when and as these fees and costs are incurred by each of the indemnified parties. The Contractor agrees to pay all of these fees, costs, and expenses to each of the indemnified parties not later than thirty (30) days following a demand for reimbursement of these fees, costs, and expenses by each of the indemnified parties. Amounts not paid by the Contractor within this thirty (30) day period shall earn interest at the rate of one percent (1%) per month until paid by Contractor in full.

In the event opposing parties have each prevailed on one or more cause of action actually contested or admitted by pleadings or pre-hearing documents on file, the presiding officer may offset such fees and costs between prevailing parties after considering the necessity of the proceeding and the importance of the issue or issues upon which a party has prevailed. However, the court or presiding officer shall have no authority to relieve the Contractor of the Contractor's obligation to pay all damages, fees, costs, and expenses of each of the indemnified parties as provided in the indemnity provisions of this contract.

The term "prevail" as used in this section shall include any action at law, in equity, or pursuant to arbitration in which either party has been successful including, but not limited to, demurrers, motions to strike, judgments on the pleadings, summary judgments or summary adjudications of issues, any other motion of whatever type or nature, or any trial proceeding or motion.
7-24 LANDS AND RIGHTS-OF-WAY

The lands and rights-of-way for the facility to be constructed will be provided by the Owner. The Contractor shall make his own arrangements and pay all expenses for additional area required by him outside the limits of the Owner's lands and rights-of-way.

Work in public right-of-way shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the work is located in addition to conforming to the Plans and Specifications. If a permit is not required, the work shall conform to the standards of the public agency involved in addition to conforming to the Plans and Specifications.

7-25 NO WAIVER OF RIGHTS OR REMEDIES

No action or failure to act by the Owner, Engineer/Architect, or Owner's Representative shall constitute a waiver of any right or duty afforded any of them under the Contract Documents, nor shall any such action or failure to act constitute an approval of or acquiescence in an breach of this contract by Contractor. No oral waiver of any rights or remedies granted to the Owner, Engineer/Architect, or Owner's Representative shall be effective for any purpose. To be effective, the waiver must be in writing and executed by an authorized representative of Owner, the Engineer/Architect, or the Owner's Representative. Contractor has been informed, and understands, that the Engineer/Architect and Owner's Representative have no authority whatsoever to waive any rights or remedies granted to the Owner by this contract or to alter any term or provision of the Contracts Documents or the approved Plans and Specifications. Any such purported waiver shall be void and unenforceable.

7-26 TAXES

The Contractor shall pay all sales, consumer, use, and other taxes.

NOTICE OF TAXABLE POSSESSORY INTEREST - The terms of this document may result in the creation of a possessory interest. If such a possessory interest is vested in a private party to this document, the private party may be subjected to the payment of personal property taxes levied on such interest.

7-27 ASSIGNMENT OF ANTI-TRUST ACTIONS

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 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 purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid 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. Section 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 purchases of goods, materials, or services by the bidder for
sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

Contractor shall insure that a comparable provision is included in all subcontracts at all tier levels which are executed pursuant to this Agreement.

7-28 PAYROLL RECORDS

It shall be the responsibility of the Contractor to maintain an accurate payroll record showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each employee in accordance with Labor Code Section 1776, and to ensure that each subcontractor also complies with all provisions of Labor Code Section 1776 and this contract provision.

All payroll records shall be certified as accurate by the applicable contractor or subcontractor or its agent having authority over such matters.

The Contractor shall ensure that all payroll records are available for inspection at the Contractor's principal office during normal business hours and shall notify the Owner, in writing, of the place where all payroll records are located from time to time.

The Contractor shall furnish a copy of all payroll records, upon request, to employees or their authorized agents, to the Owner, to the Division of Labor Standards Enforcement, and to the Division of Apprenticeship Standards of the Department of Industrial Relations. The Contractor shall also furnish a copy of payroll records to the general public upon request provided the request is made through the Owner, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement of the Department of Industrial Relations. In no event shall members of the general public be given access to payroll records at the Contractor's principal office.

Records made available to the general public in accordance with the prior paragraph shall be marked or obliterated in such a manner that the name and address of the Contractor and/or subcontractor and the name, address, and telephone number of all employees does not appear on the modified record.

The Contractor shall file a certified copy of any requested payroll records with the entity that requested such records within ten days of the date a written request for payroll records has been received.

Failure of the Contractor to comply with any provisions of this article or Labor Code Section 1776 within ten days of the date of a written request for compliance is received shall result in a forfeiture of up to $50 per calendar day or portion thereof, for each worker, until strict compliance is obtained. Upon notification by the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement of the Department of Industrial Relations, the Owner shall withhold penalties under this article or Labor Code Section 1776 from the Contractor's payments then due.

7-29 MODIFICATION

This contract may not be altered in whole or in part except by modification in writing and properly executed by all parties hereto or by change as provided herein.
7-30 JURISDICTION AND VENUE

In the event any legal or equitable proceeding is commenced to invalidate, enforce, or interpret any of the terms or provisions of this contract, the parties expressly agree that jurisdiction and venue shall lie only in the Superior Court located in the North County Judicial District, County of San Diego, State of California. The Contractor acknowledges and agrees that this contract has been executed and requires performance solely within the jurisdiction and venue of the North County Judicial District and that the contract requires work solely within the jurisdiction and venue of the North County Judicial District.

7-31 HAZARDOUS WASTE

It shall be the responsibility of the Contractor to pay all fees and costs associated with removal and cleanup of any hazardous waste used at or brought to the job site by the Contractor, any subcontractor, or any agent, representative, or employee of the Contractor or any subcontractor.

The Contractor shall identify and remove all such hazardous waste in accordance with all federal, state, and local rules and regulations and shall promptly notify the Owner's Representative of any such hazardous waste. If hazardous waste is discovered during performance of the work which has not been brought to, or used at, the job site by the Contractor, any subcontractor, or any agent, representative, or employee of the Contractor or any subcontractor, the Contractor shall identify and remove this hazardous waste in accordance with all federal, state, and local rules and regulations and in accordance with directions of the Owner and the Contractor shall be entitled to request an increase in compensation due for these removal and cleanup costs in accordance with Article 9-1 PAYMENT FOR CHANGES IN THE WORK.

7-32 EXCAVATIONS BELOW FOUR (4) FEET

If any work required by this contract includes digging trenches or other excavations that extend deeper than four feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify the Owner in writing of any:

Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.

Subsurface or latent physical conditions at the site differing from those indicated.

Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

Nothing in this article is intended to relieve the Contractor of his responsibility to carefully examine the Contract Documents and the site where the work is to be performed in accordance with Article 2-8 EXISTING CONDITIONS AND EXAMINATION OF CONTRACT DOCUMENTS; to familiarize himself with all local conditions and federal, state, and local laws, ordinances, rules, and regulations that may affect the performance of any work; to study all surveys and investigation...
reports about subsurface and latent physical conditions pertaining to the job site; to perform such additional surveys and investigations as the Contractor deems necessary to complete the work at his bid price; and to correlate the results of all such data with the requirements of the Contract Documents.

If the Owner determines that hazardous waste exists and that conditions exist which Contractor could not discover through the investigations required by the preceding paragraph, the Owner shall notify the Contractor and the Contractor may request a change order in accordance with Article 9-1 PAYMENT FOR CHANGES IN THE WORK. Nothing in this article shall relieve the Contractor of the obligation to pay all fees and costs associated with removal and cleanup of any hazardous waste used at, or brought to, the job site by the Contractor as specified in Article 7-31 HAZARDOUS WASTE. Nor shall this article relieve the Contractor of responsibility for site conditions discoverable by any investigation required by the preceding paragraph.

In the event that a dispute arises between the Owner and the Contractor involving hazardous waste and whether site conditions differ materially from those the Contractor could or should have discovered by the investigations required by this contract, the Contractor shall not be excused from the scheduled completion date provided in the Contract Documents and shall proceed with all work in the manner and in the time required by the Contract Documents.

7-33 ARBITRATION

All public works claims between the Contractor and Owner relating to this contract where the total claims of both parties are equal to or less than $375,000 shall be submitted to mediation first and then to arbitration in accordance with Public Contract Code Section 20104, et seq. A copy of Public Contract Code Section 20104, et seq stating these arbitration requirements is attached following the General Provisions. When a total payment of the Contractor and the Owner exceed a total of $375,000, this section shall not apply and neither the Owner nor the Contractor shall have any obligation to arbitrate the claim.

SECTION 8 CONTRACTOR'S INSURANCE

8-1 GENERAL

The Contractor shall not commence or continue to perform any work unless he, at his own expense, has in full force and effect all required insurance. The Contractor shall not permit any subcontractor to perform work on this project unless the Workers' Compensation Insurance requirements have been complied with by such subcontractor.

The types of insurance the Contractor shall obtain and maintain are Workers' Compensation Insurance and Employer's Liability Insurance, Liability Insurance, Builders' Risk "All Risk" Insurance, all as set forth herein.

Workers' Compensation Insurance and Employer's Liability Insurance and Liability Insurance shall be maintained in effect for the full guarantee period.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.
As evidence of specified insurance coverage, the Contractor shall provide certificates of insurance and endorsements on the forms provided as a part of the Contract Documents. No alteration or substitution of said forms will be allowed.

8-2 WORKERS’ COMPENSATION INSURANCE AND EMPLOYER’S LIABILITY INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance certifying that he has obtained for the period of the contract full Workers’ Compensation Insurance coverage for no less than the statutory limits and Employer’s Liability Insurance coverage in limits not less than the amounts set forth in the Special Provisions, for all persons whom he employs or may employ in carrying out the work under the contract. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as part of the Contract Documents. This insurance shall be in strict accordance with the requirements of the most current and applicable state Workers’ Compensation Insurance laws.

8-3 LIABILITY INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance showing that he has Liability Insurance coverage in limits not less than the amounts set forth in the Special Provisions. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as part of the Contract Documents.

All liability insurance shall include occurrence coverage with a deductible amount not exceeding the amount specified on the liability certificate form.

Included in such insurance shall be a "Cross Liability" or "Severability of Interest" clause.

The Liability Insurance coverage shall include each of the following types of insurance:

A. General Liability
   (1) Comprehensive Form.
   (2) Premises-Operations.
   (3) Explosion and Collapse Hazard.
   (4) Underground Hazard.
   (5) Products/Completed Operations Hazard.
   (6) Contractual Insurance.
   (7) Broad Form Property Damage Including Completed Operations.
   (8) Independent Contractors.
   (9) Personal Injury.

B. Automobile Liability
   (1) Comprehensive Form Including Loading and Unloading.
(2) Owned.
(3) Hired.
(4) Non-Owned.

The Liability Insurance shall include as additional insureds: the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents. The insurance afforded to these additional insureds shall be primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of the insurance provided under this article on LIABILITY INSURANCE shall not be reduced or prorated by the existence of such other insurance.

8-4 BUILDERS' RISK "ALL RISK" INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance showing that he has obtained for the period of the contract Builders' Risk "All Risk" completed value insurance coverage (including any damage attributable directly or indirectly to surface water, runoff, rainfall or flood but excluding earthquake and tidal wave) upon the entire project which is the subject of the contract and including completed work and work in progress. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as a part of the Contract Documents. Such insurance shall include as additional insureds: the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents.

Such insurance may have a deductible clause but not to exceed $25,000.

8-5 CONTRACTOR'S LIABILITY NOT LIMITED BY INSURANCE

Nothing contained in these insurance requirements is to be construed as limiting the liability of the Contractor or the right of the Owner to secure damages in excess of any insurance which may be provided.

SECTION 9 ESTIMATES AND PAYMENTS

9-1 PAYMENT FOR CHANGES IN THE WORK

The Contractor shall not be entitled to any increase in the contract price due to any change in the work unless the Contractor submits a written request within seven calendar days from the date of the event which causes the Contractor to request a change in the price.

Changes in, additions to, or deductions from the work, including increases or decreases in the quantity of any item or portion of the work, shall be set forth in a written change order executed by the Owner and by the Contractor which shall specify:

The changes, additions, and deductions to be made.

The increase or decrease in compensation due the Contractor, if any.

Adjustment in the time of completion, if any.
Adjustment in the compensation due the Contractor shall be determined by one or more of the following methods in the order of precedence listed below:

Unit price contained in the contract.

Mutually agreeable lump sum or unit prices. If requested by the Owner's Representative, the Contractor shall furnish an itemized breakdown of the quantities and prices used in computing proposed lump sum and unit prices.

Force account whereby the Contractor is compensated for furnishing labor, materials, tools, and equipment as follows:

Cost of labor plus 15% for workers directly engaged in the performance of the work. Cost of labor shall include actual wages paid including employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes plus payments imposed on payroll amounts by state and federal laws plus subsistence and travel allowance payments to workers.

Cost of material plus 15%. Cost of material shall include sales tax, freight, and delivery charges. The Owner reserves the right to furnish such materials as he deems advisable and the Contractor shall not be paid the 15% markup on such materials.

For tools and equipment actually engaged in the performance of the work, rental rates plus 15%. The rental rates shall be those prevailing in the area where the work is performed. No rental charge shall be made for the use of tools or equipment having a replacement value of $500 or less.

Subcontractor invoices to the Contractor plus 5%. Subcontractor invoices shall be based on the above-described cost of labor plus 15%, cost of material plus 15%, and tool and equipment rental rates plus 15%.

No payment shall be made for any item not set forth above, including without limitation, Contractor’s overhead, general administrative expense, supervision, or damages claimed for delay in prosecuting the remainder of the work.

For force account work, the Contractor shall submit to the Owner's Representative for his verification, daily work sheets showing an itemized breakdown of labor, materials, tools, and equipment used in performing the work. No payment will be made for work not verified by the Owner's Representative.

9-2 PROGRESS PAYMENTS

The Contractor shall, on or before the third day of each calendar month after actual construction work is started, prepare the Progress Estimate and Payment Form included at the end of the General Provisions. The Contractor and the Owner’s Representative shall review each work item and agree on the total value of work performed during the previous month. In the event the Contractor and the Owner’s Representative cannot agree on the estimated total value of work during the previous month, the estimated total value of work performed as determined by the Owner’s Representative during the previous month shall be used. No progress payment will be processed by the Owner until all information required by the Progress Estimate and Payment Form...
has been completed and the Contractor has signed the form. By signing the Progress Estimate and Payment Form, the Contractor expressly waives and releases any claims the Contractor may have, of whatever type or nature, for the period specified which is not shown as a retention amount or a disputed claim on the Release Form included at the end of the General Provisions. The Contractor shall submit to the Owner within seven days from signing the Progress Estimate and Payment Form a completed and signed Release Form that corresponds to the same pay estimate work period. The Owner shall have no obligation to pay the Contractor for any work done until the Release Form has been executed by the Contractor and submitted to the Owner for the corresponding pay period in accordance with Article 9-6 REQUIRED RELEASES.

Properly submitted Progress Estimate and Payment Form with corresponding Release Form shall be paid by the Owner within thirty days after receipt. Properly submitted forms not paid within this thirty-day period shall earn interest at the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure. The Contractor and Owner agree that the thirty-day period for payment shall not commence until the Contractor has executed and submitted the Release Form to the Owner for the corresponding pay period.

In preparing any progress payment with the Contractor, the Owner’s Representative will may use the cost breakdown in by Article 6-3 CONTRACTOR’S CONSTRUCTION SCHEDULE AND COST BREAKDOWN. No allowance shall be made for materials delivered but not installed. In evaluating any progress payment, the Owner’s Representative may take into consideration any facts and conditions deemed proper by him or her in his or her sole discretion including, but not limited to, the ratio of the difficulty or cost of the work done to the probable difficulty or cost of the work remaining to be done under the contract, the value of the work actually completed, and the estimated cost to complete all of the work in accordance with the contract price. In the event of any dispute between the Owner and the Contractor on the amount that should be paid for any progress payment, the determination of the Owner or the Owner’s Representative shall control and be binding on the Contractor. No dispute between the Contractor and the Owner concerning the amount to be paid for any progress payment shall relieve the Contractor of its continuing obligation to complete all contract work within the time required by the Contract Documents, and to complete the work for the contract price and shall not relieve the Contractor of any other obligations contained in the Contract Documents. Owner shall retain five percent (5%) of each progress payment approved by the Owner’s Representative as part security for the fulfillment of the contract by Contractor, unless Contractor has substituted adequate equivalent securities as required by Article 9-5 WITHHELD CONTRACT FUNDS. The total amount retained will equal 5% of the contract price. In the event of a dispute between the Owner and Contractor, the Owner shall have the right to withhold an amount up to 150% of the disputed amount in accordance with Public Contract Code Section 7107(c). As part of any progress payment the Owner shall have the express right to deduct and withhold from any payments due the Contractor any amounts the Owner or the Owner's Representative determines are necessary or appropriate to cover all fees, costs, expenses, and damages incurred or estimated by the Owner as a result of any breach of this contract by the Contractor and to cover any and all damages suffered or estimated by the Owner as a result of the breach of any term or provision of the contract by the Contractor. Amounts the Owner may withhold also expressly include any and all liquidated damages authorized by the terms of this contract.
9-3  FINAL ESTIMATE AND PAYMENT

Contractor shall not make any request for the final payment until all work required by the Plans and Specifications of the Contract Documents has been completed to the satisfaction of the Owner's Representative. Upon receipt of a request from Contractor for final payment, the Owner's Representative will make a final inspection of the work done and advise the Contractor of additional work required before final payment will be processed. All prior progress estimates and payments shall be subject to correction in the final estimate and payment.

The final payment shall not be due and payable until 60 calendar days after the date of filing a Notice of Completion of the accepted work. The date of completion shall be determined in accordance with Public Contract Code Section 7107. In the event of a dispute between the Owner and the Contractor, Owner shall be entitled to withhold an amount up to 150% of the disputed amount.

It is mutually agreed between the parties to the contract that no certificate given or payment made under this contract shall constitute evidence of performance of the contract and no payment by Owner shall be construed as an acceptance of any defective work or improper materials.

Contractor shall not be entitled to payment of the final amount due until Contractor has executed a Release Form in accordance with Article 9-6 REQUIRED RELEASES. Contractor hereby expressly agrees that payment of the final mount due under the contract shall release the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents, from any and all claims relating to the work for which Contractor is being paid. It is the declared intention of the parties that this provision comply with Public Contract Code Section 7100 and that this section shall be construed as in compliance with Public Contract Code Section 7100 to the maximum feasible extent.

9-4  OWNER'S RIGHT TO WITHHOLD CERTAIN AMOUNTS AND MAKE APPLICATION THEREOF

In addition to the amounts which the Owner may retain under Sections 9-2 and 9-3 of this contract, the Owner may withhold a sufficient amount or amounts from any payment otherwise due to the Contractor (including any final payment) as may be necessary or appropriate in Owner's sole and exclusive judgment to cover each of the following:

- Payments which are or may be past due and payable for properly filed claims against the Contractor or any subcontractors for any labor, materials, or equipment furnished in or about the performance of the work on the project under this contract including any amounts asserted as attorneys' fees, costs, or interest by the claimant.

- All fees, costs, and expenses estimated by the Owner for correcting any work determined to be defective by the Owner.

Any amounts determined appropriate or necessary by the Owner to cover the Owner’s estimate of any damages paid or payable as a result of any claim or cause of action on the contract caused, or claimed to be caused by any action or omission of Contractor, any subcontractor, supplier or materialmen or their respective directors, officers, agents, employees, members, managers or consultants and all fees, costs, and expenses, including all attorneys’ fees, expert fees and costs, staff time at each staff members’ normal
hourly rates and all court costs estimated by the Owner in responding to the claim or cause of action.

Any amounts determined necessary or appropriate by Owner to cover all of the indemnity obligations of Contractor under this contract.

Any amounts claimed by the Owner as forfeiture due to delay and any and all other amounts, fees, costs, or expenses estimated by the Owner as offsets.

The Owner has the express authority to withhold any amount or amounts determined appropriate by Owner from time to time from any payments otherwise due Contractor to cover all or any of the preceding items in the Owner’s sole and exclusive judgment. The Owner may also apply all or any portion of any such withheld amount or amounts to the payment of any claims in such amounts and at such times as are determined appropriate by Owner, in Owner’s discretion. In withholding any sums permitted by this section or in paying any claims, the Owner shall be deemed the agent of the Contractor and any payments made by the Owner on any claim shall be considered as a payment made under the contract by the Owner to the Contractor. The Owner shall not be liable to the Contractor for Owner’s withholding of any and all amounts permitted by this section or Owner’s payment of any claims as permitted by this section. Such withholdings and payments may be made by Owner at any time without prior judicial determination of the merits of any claims or causes of action. The Owner will render to the Contractor a proper account of any funds withheld or disbursed as permitted by this section.

9-5 WITHHELD CONTRACT FUNDS

Pursuant to Public Contract Code Section 22300, the Contractor may substitute equivalent securities for retention amounts which this Contract requires. However, the Owner reserves the right to solely determine the adequacy of the securities being proposed by the Contractor and the value of those securities. The Owner shall also be entitled to charge an administrative fee, as determined by Owner in its sole discretion, for substituting equivalent securities for retention amounts.

The Contractor agrees that the Owner’s decision with respect to the administration of the provisions of Section 22300 shall be final and binding and not subject to subsequent litigation or arbitration of any kind as to acceptance of any securities being proposed, the value of these securities, the costs of administration and the determination of whether or not the administration should be accomplished by an independent agency or by the Owner. The Owner shall be entitled, at any time, to request the deposit of additional securities of a value designated by the Owner, in Owner’s sole discretion, to satisfy this requirement. If the Owner does not receive satisfactory securities within 12 calendar days of the date of the written request, Owner shall be entitled to withhold amounts due Contractor until securities of satisfactory value to Owner have been received.

9-6 REQUIRED RELEASES

In accordance with Public Contract Code Section 7100, the Contractor shall not be entitled to any payment specified in this Contract which is undisputed until such time as the Contractor has executed the Release Form(s) included at the end of the General Provisions releasing the Owner from all claims relating to work for which the Contractor is being paid. The Release Form contains space for the Contractor to claim any disputed amount and to designate the retention amount for
each pay period associated with the release. Contractor hereby expressly agrees that failure on his part to designate any disputed amount or to designate the correct retention amount for each release period on the Release Form shall constitute an express waiver of the right of the Contractor to claim any disputed amount or any retention amount at any later date. The Owner shall have no obligation to pay the Contractor for any work done until the Release Form at the end of the General Provisions has been executed by the Contractor and submitted to the Owner.

SECTION 10 AUTHORITY AND STATUS OF OWNERS REPRESENTATIVES

10-1 STATUS OF OWNERS REPRESENTATIVES

The Contractor has been informed, and understands, that the Engineer/Architect and the Owner’s Representative are not agents or employees of Owner. They are independent contractors retained by Owner to assist in preparation of the design plans for the work and in supervising the work to be performed by the Contractor. Owner does not direct the Engineer/Architect or the Owner’s Representative in the performance of their respective duties and obligations. Owner shall not be liable for any errors or omissions of the Engineer/Architect, the Owners Representative or their respective directors, officers, agents or employees.

10-2 AUTHORITY OF OWNER’S REPRESENTATIVES

Contractor has been informed, and understands, that the Engineer/Architect and the Owner’s Representative have no authority to alter any of the terms or provisions of the Contract Documents or to alter any of the requirements contained in the plans and specifications approved by Owner. In the event that Contractor desires to modify any term or provision of the Contract Documents or to modify any of the requirements of the approved plans and specifications, a written request must be submitted with the requested changes to the Owner through the Owner’s Representative. Only the general manager of Owner has the authority to alter or modify any of the terms or provisions of the Contract Documents. No modification or change to the Contract Documents shall be effective for any purpose unless the change or modification has been expressly approved, in writing, by the general manager of Owner. Any requested changes by the Contractor to the approved plans and specifications must be submitted to the Owner’s Engineer for review and approval through the Owner’s Representative. No changes to the approved plans or specifications shall be effective for any purpose unless the Owner’s Engineer has expressly approved of the change, in writing. The Contractor is expressly prohibited from entering onto private property, disturbing any habitat, or using private property to stockpile, store, or spread any men, tools, equipment, materials, or dirt without the express prior written consent of the general manager of Owner. The violation of this section by Contractor or any of its subcontractors, materialmen, or suppliers or their respective directors, officers, managers, members, agents, consultants or employees shall constitute a material breach of this Agreement.

SECTION 11 FORMS

11-1 APPROVED MATERIALS LIST SUBMITTAL

The Contractor shall complete the Approved Materials List (AML) which can be found on the Bids and Planning page of the District’s website at www.olivenhain.com as called for in the Special Provisions and Standard Specifications and submit as directed by the Owner’s Representative. No substitution or revision to this form will be accepted or approved by the Owner.
11-2 SHOP DRAWING SUBMITTAL FORM

The Contractor shall complete the Shop Drawing Submittal Form included at the end of the General Provisions when submitting Shop Drawings as called for in the Special Provisions and Standard Specifications or requested by the Owner’s Representative. Duplication of this form is permissible to comply with the requirements of the Contract Documents. No substitution or revision to this form will be accepted and approved by the Owner.

11-3 PROGRESS ESTIMATE AND PAYMENT FORM

The Contractor will use the Progress Estimate and Payment Form included at the end of the General Provisions when preparing the monthly progress payment for review. No progress payment will be processed to pay the Contractor until the progress estimate and payment form and the release form included at the end of these general provisions have been fully completed and submitted by the Contractor to the Owner’s Representative and approved by the Owner.

11-4 RELEASE FORM(S)

The Contractor shall complete the Conditional and/or Final Release Forms (as appropriate) included at the end of the General Provisions and submit to the Owner for the corresponding pay period in accordance with Article 9-6, REQUIRED RELEASES. Duplication of this form is permissible to comply with the requirements of the Contract Documents. No substitution or revision to this form will be accepted. No payment request to the Contractor will be processed until the Release Form has been fully completed and submitted by the Contractor.

END OF SECTION
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<th>OWNER’S REPRESENTATIVE</th>
<th>From:</th>
<th>(Contractor)</th>
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| Owner: | OLIVENHAIN MUNICIPAL WATER DISTRICT | OMWD PN: D700019 |
| Project: | 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT | OWNER’S REP ACCT NO. __________________________ |

| SUBMITTAL NO.: | __________________________ | RESUBMITTAL: | □ Yes | □ No |
| SPECIFICATION SECTION: | __________________________ |             |      |      |
| DESCRIPTION: | __________________________ |             |      |      |

This Shop Drawing Submittal has been prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and illustrates some portion of the work. The Contractor warrants one of the following conditions:

- □ The Contractor has approved this submittal and represents that the material, equipment, and other work shown conforms to the Plans and Specifications.
- □ The Contractor has approved this submittal but represents that this is a deviation from the requirements of the Plans and Specifications and has set forth the reasons for the deviation below.

DEVIATION/REVISIONS:

By: __________________________  Title: __________________________
### PROGRESS ESTIMATE AND PAYMENT FORM

**Owner:** OLIVENHAIN MUNICIPAL WATER DISTRICT  
**Project:** 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT  
**Contractor:**  

**Contract End Date**  
**Revised Contract End Date**  
**PAYESTIMATE NO.**  
**PERIOD WORK PERFORMED:**  
**Contract Job No.**  
**Date Created**

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**Total Project Cost of Work Items**  
**Estimated Total Value of Work Performed**  
**Less Five Percent (5%) of Such Estimated Total Value**  
**Total Amount Due for Work Performed**  
**Less All Previous Payments**  

**AMOUNT DUE AND PAYABLE TO THE CONTRACTOR**

Prepared by Owner’s Representative  

Accepted by CONTRACTOR  

Approved by OWNER

By: ____________________________  
By: ____________________________

Date: ____________________________  
Date: ____________________________

Distribution:  

- Owner  
- Contractor  
- Engineer  
- Finance
CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT
(CA CIVIL CODE §8132) (1)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT’S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: ________________________________

Name of Customer: Olivenhain Municipal Water District

Job Location: ________________________________

Owner: Olivenhain Municipal Water District

Through Date: ________________________________

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: Olivenhain Municipal Water District

Amount of Check: ________________________________

Check Payable to: ________________________________

This document does not affect any of the following:

(1) Retentions.
(2) Extras for which the claimant has not received payment.
(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:
   Date(s) of waiver and release: ________________________________
   Amount(s) of unpaid progress payment(s): $____________________
(4) Contract rights, including:
   (A) a right based on rescission, abandonment, or breach of contract, and
   (B) the right to recover compensation for work not compensated by the payment.

SIGNATURE

Claimant’s Signature: ________________________________

Claimant’s Title: ________________________________

Date of Signature: ________________________________
NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT’S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant:

Name of Customer: Olivenhain Municipal Water District

Job Location:

Owner:

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: Olivenhain Municipal Water District

Amount of Check:

Check Payable To:

Exceptions

This document does not affect any of the following:

Disputed claims for extras in the amount of: $__________________________

SIGNATURE

Claimant’s ___________________________ Signature: ___________________________

Claimant’s Title: ___________________________

Date of Signature: ___________________________
PROPOSED CHANGE ORDER

Owner: OLIVENHAIN MUNICIPAL WATER DISTRICT OMWD PN: D700019
Project: 4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

Contractor: ________________________

PROPOSED CHANGE ORDER NO. _______ Date: _______

*A change to the contract documents for the above referenced project is being considered. Please provide cost and schedule impact(s) for the following described work:

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<th>DESCRIPTION OF CHANGE / PCO's</th>
<th>Cost Impact</th>
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<td>__________ Day(s)</td>
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</tbody>
</table>

TOTAL $___________ ________ Calendar Day(s)

NOTE: Attention is called to the sections in the General Provisions on Scope of Work and Estimates and Payments.

THIS PROPOSED CHANGE ORDER IS NOT EFFECTIVE UNTIL A CONTRACT CHANGE ORDER HAS BEEN APPROVED BY OWNER.

This PCO was initiated by ______________________

On ______________________

Submitted ______________________

On ______________________

______________________________
Contractor
Article 1.5

RESOLUTION OF CONSTRUCTION CLAIMS

Section 20104. Application of article; provisions included in plans and specifications.

Section 20104.2. Claims; requirements; tort claims excluded.

Section 20104.4. Civil action procedures; mediation and arbitration; trial de novo; witnesses.

Section 20104.6. Payment on undisputed portion of claim; interest on arbitration awards or judgments.

Section 20104.8. Repealed.

§ 20104. Application of article; provisions included in plans and specifications

(a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between a contractor and local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.

(b) (1) “Public work” has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that “public work” does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) “Claim” means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)
§ 20104.2 Claims; requirements; tort claims excluded

For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b) (1) For claims of less than fifty thousand dollars ($50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 80 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency’s written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c) (1) For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency’s written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency’s written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency’s response or within 15 days of the local agency’s failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of Government Code.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)
§ 20104.4 Civil action procedures, mediation and arbitration; trial de novo; witnesses

The following procedures are established for all civil actions filed to resolve claims subject to the article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney’s fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)
§ 20104.6  Payment on undisputed portion of claim; interest on arbitration awards or judgments

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)

Historical and Statutory Notes

1990 Legislation
Former § 20104.6, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, relating to payment of undisputed portion of claims, was repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994. See, now, this section.

§ 20104.8  Repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994

Historical and Statutory Notes
The repealed section, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, related to application of the article to specified contracts and provided for repeal of the article on Jan 1, 1994.
SECTION 00810 – SPECIAL PROVISIONS

1.01 DEFINITIONS

Whenever the following terms occur in the Contract Documents, the meaning shall be interpreted as follows:

ATTORNEY FOR Owner – Alfred E. Smith, Nossaman LLP, 777 South Figueroa Street, 34th Floor, Los Angeles, CA 90017, (213) 612-7831

BOARD OF DIRECTORS - Board of Directors of the Olivenhain Municipal Water District.

CONTRACT TIME – The number of consecutive days stated in the contract documents commencing from the date of the notice of award, for completion of the Work.

DATE OF AWARD OF CONTRACT - The date of the District Resolution (formal action of the Board of Directors of the District) awarding the Contract.

DISTRICT - Olivenhain Municipal Water District (OMWD), 1966 Olivenhain Road, Encinitas, California 92024, (760) 753-6466.

DISTRICT'S REPRESENTATIVE - The Owner's Representative.

ENGINEER / DESIGN ENGINEER – Gannett Fleming, Inc., 570 Rancheros Drive, Suite 200, San Marcos, CA 92069, Tel: (760) 891-4180.

OWNER - Olivenhain Municipal Water District (OMWD), 1966 Olivenhain Road, Encinitas, California 92024, Tel: (760) 753-6466; Fax: (760) 753-1578.

OWNER'S REPRESENTATIVE - The person or engineering/architectural firm authorized by the District to represent it during the performance of the work and until final acceptance. The Owner's Representative is referred to throughout the Contract Documents as if singular in number and masculine in gender. The Owner's Representative means the Owner's Representative and his assistants.


REGIONAL STANDARD DRAWINGS – Standard Drawings for Agencies in the San Diego Region as recommended by the Regional Standards Committee and published by the San Diego County Department of Public Works, October 2018.

SPECIAL PROVISIONS - Section 00810 of the specifications.

SPECIFICATIONS - Division 1 to 16 of the technical specifications contained in these Contract Documents, and those technical specifications contained in the Drawings.

Whenever the following terms appear in the State Standard Specifications or Public Works Specifications, the meaning shall be interpreted as follows:

**AGENCY, BOARD or DEPARTMENT** - The Owner.

**ENGINEER** - The Owner's Representative.

1.02 TERMS

Command type sentences used in the Contract Documents refer to and are directed to the Contractor.

1.03 ABBREVIATIONS

Interpret abbreviations used on the Drawings and in the Specifications as explained on the Drawings.

1.04 MARKING AND ADDRESSING BID ENVELOPE

Bids shall be made on the Bid Form and Bid Bond included within the Contract Documents. Complete and include the Bid Form Checklist together with the completed Bid Form and Bid Bond when submitting a bid. Seal the Contract Documents with the filled out bid in an envelope marked and addressed as follows:

BID FOR CONSTRUCTION OF:
4S WRF CLARIFIER DRIVES REPLACEMENT PROJECT

OLIVENHAIN MUNICIPAL WATER DISTRICT
Attention: Jason P. Hubbard, Engineering Manager
1966 Olivenhain Road
Encinitas, California 92024

1.05 AWARD OF CONTRACT OR REJECTION OF BIDS

Within a period of 60 calendar days after the opening of bids, the District will accept or reject the bids.
1.06 CONTRACTOR’S LICENSING REQUIREMENTS

The District has determined the license classification necessary to bid and perform the subject contract. In no case shall this contract be awarded to a specialty contractor whose classification constitutes less than a majority of the portion of the work of this contract, all work to be performed outside of the contractor's license specialty, except work specifically authorized by District, shall be performed by a licensed subcontractor in compliance with the Subletting and Subcontractor Fair Practices Act commencing with Section 4100 et seq., of the Public Contract Code. See Business and Professions Code Section 7059.

The Contractor's license classification required for this project is a California State Contractor's License Class A or Class B.

The Contractor shall be or is required to obtain the services of an Authorized EMICO Installer.

It is the District's intent that "plans", as used in Public Contract Code Section 3300, is defined as the construction Contract Documents, which include both the Drawings and the Specifications.

1.07 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY

The work shall be completed within SIXTY (60) CONSECUTIVE CALENDAR DAYS from and after the date of the Notice to Proceed.

The Contractor shall complete all work for replacement of the two (2) clarifier drives, motors and ancillary work with District purchased units, including all testing to place the new units into operation within the following schedule after a Notice to Proceed.

- Milestone 1; Replacement of the 1st clarifier drive: Ten (10) working days for mobilization, removal of the existing clarifier bridge, related utilities and drives and installation of the new drives, re-installation of the clarifier bridge and related utilities. Two (2) working days for checkout and commissioning, including the requirement for documenting the continuous operation of the new drives and motors for an 8-hour continuous period following the placement of the clarifier back into operation by the District.

- Milestone 2; Replacement of the 2nd clarifier drive: Ten (10) working days for mobilization, removal of the existing clarifier bridge, related utilities and drives and installation of the new drives, re-installation of the clarifier bridge and related utilities. Two (2) working days for checkout and commissioning, including the requirement for documenting the continuous operation of the new drives and motors for an 8-hour continuous period following the placement of the clarifier back into operation by the District.

- A minimum of two (2) working days and a maximum of five (5) working days shall be provided by the Contractor in his schedule between the completion of the installation and testing of first clarifier drive and motor assembly and the start of the work associated with the second clarifier drive and motor assembly replacement.
The Contractor will not be permitted to begin work until the agreement, bonds or substitutes, insurance certificates and endorsements are acceptable to the District and Attorney for Owner. This period of time is set forth in Paragraph 3-2 Execution of Contract in the General Provisions. Time is of the essence in this contract.

The Contractor shall complete all work in its entirety as specified in the Contract Documents within these time periods. Time of completion shall also include time for all submittals and coordination required to satisfy the requirements of these Contract Documents.

The Contractor agrees that the work shall be prosecuted regularly, diligently, and uninterruptedly and at such rate of progress as will insure full completion thereof within the Time for completion stated above. It is expressly understood and agreed, by and between Contractor and Owner that the Time for completion is reasonable for the completion of the WORK, taking into consideration the average climatic range, usual industrial conditions prevailing in this locality, and lead time required to procure equipment.

Pursuant to Government Code 53069.85, forfeiture for each day completion is delayed beyond the time allowed will be at the rate of $2,500 per day.

1.08 USE OF ASBESTOS PRODUCTS NOT PERMITTED

The intent of the Contract Documents is to provide asbestos-free components throughout the project in accordance with the recent Environment Protection Agency stated policy seeking a ban on the use of all products containing asbestos. Where the Contract Documents or the referenced specifications, standards, codes, or tests refer to products containing asbestos, the Contractor shall provide acceptable alternatives under those documents, or in the absence of such referenced alternatives, he shall submit a proposed substitute to the District's Representative for review and acceptance.

1.09 ABATEMENT OF AIR POLLUTION

A. Comply with all applicable Federal, State, County, and City laws and regulations concerning the prevention and control of air pollution.

B. Conduct construction activities and equipment in a manner so as to minimize atmospheric emissions or discharges of air contaminants. Equipment or vehicles that show excessive emissions of exhaust gases shall not be operated on the site.

1.10 NOISE CONTROL REQUIREMENTS

A. The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the Contract.

B. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

C. Noise level requirements shall apply to all equipment on the job or related to the job, including but not limited to trucks and transient equipment that may or may not be owned.
by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety for the protection of personnel.

1.11 AMOUNT OF LIABILITY INSURANCE

A. Employer’s Liability Insurance:

1. Bodily injury coverage by accident shall be for not less than $1,000,000 for each employee and $1,000,000 for each accident.

2. Bodily injury coverage by disease shall be for not less than $1,000,000 for each employee and $1,000,000 for each disease.

B. General Liability:

Bodily injury, personal injury, and property damage coverage shall be in a combined single limit of not less than $1,000,000 for each occurrence and $3,000,000 aggregate.

C. Automobile Liability:

Bodily injury and property damage coverage shall be in a combined single limit of not less than $1,000,000 for each occurrence.

D. Builder’s Risk Insurance:

Builder’s risk insurance shall be provided for the full contract amount.

E. Earthquake and Tidal Wave Insurance:

Earthquake and Tidal Wave Insurance is not required for this project.

F. Additional Insured:

In addition to the additional insureds required for Liability insurance in the General Provisions, 8-3 LIABILITY INSURANCE, and 8-4 BUILDER’S RISK “ALL RISK” INSURANCE, the OWNER and each of its directors, officers, employees, and agents and its Design Engineer shall be named as additional insureds for all Liability insurance and Builders’ Risk Insurance provided herein.

1.12 USE OF THE STANDARD DRAWINGS

Where the Drawings or Specifications make reference to the Standard Drawings, construct the item in accordance with the details and materials as specified in the Contract Documents. For items not included in the Standard Drawings that are part of the Contract Documents, construct the item in accordance with the Olivenhain Municipal Water District, Standard Specifications and Drawings for the Construction of Water, Recycled Water, and Sewer Facilities dated February 2017 with revisions. These District Standard Drawings and Standard Specifications are available for purchase at the office of the District.
1.13 CONSTRUCTION SCHEDULE AND BID BREAKDOWN

The Contractor shall conform to the requirements of Article 6-3 Contractor's CONSTRUCTION SCHEDULE AND COST BREAKDOWN of the General Provisions within 15 days after the date of award of contract. Submit to the District's Representative a construction progress schedule and bid breakdown in bar chart form. Divide each lump sum bid item into its major elements of work and show separately labor, materials and equipment costs. The District's Representative will use this cost breakdown as a basis for the monthly progress estimate and payment. The schedule shall specifically include and identify the construction sequence requirements defined on the plans.

1.14 STORM WATER POLLUTION PREVENTION

A. IMPLEMENTATION OF BMPs

1. The Contractor shall be responsible to protect the site at all times to prevent the unauthorized discharge of stormwater and other pollutants.

2. The Contractor shall be responsible to protect but is not limited to the following:

   A. Stockpiles (Soil, Asphalt, Concrete, Sand, Gravel and other material)
   B. Concrete Washouts
   C. Trash Containers and Dumpsters
   D. Slopes and Disturbed areas
   E. Equipment and Vehicles
   F. Bagged and Boxed materials
   G. Liquid and Hazardous materials
   H. Portable Toilets and Storage Facilities

3. The Contractor shall install, implement and maintain the BMPs to the Maximum Extent Practical (MEP) to prevent or reduce pollutant discharges to local storm drain, storm drain conveyance systems and/or receiving waters from construction activities. BMPs are to be installed per the California Stormwater Quality Association (CASQA) BMP Handbook (2009) and shall be applied to but not limited to the following:

   A. Erosion Control on Slopes
   B. Erosion Control on Flat areas; or BMPs to desilt runoff from flat areas
   C. Runoff Velocity Reduction
   D. Sediment Control
   E. Offsite Sediment Tracking Control
   F. Materials Management
   G. Stockpile Management
   H. Waste Management
   I. Vehicle and Equipment Management
   J. Temporary Soil Stabilization
   K. Storm Drain Inlet Protection
L. Wind Erosion Control
M. De-watering an Hydrostatic Operations
N. Materials Pollution Control
O. Water Conservation
P. Structure Painting and Construction
Q. Paving Operations
R. Planned Construction Operations
S. Downstream Erosion Control
T. Prevention of Non-Storm Water Discharges
U. Protection of Ground Water

4. BMPs are to be installed by qualified personnel only.

5. The Contractor shall inform the District of any BMP failures, malfunctions, breeches and/or discharges during the course of construction. The Contractor will be responsible for the repair and cleanup of any breach and or discharge caused or related to their work at no additional cost to the District.

6. The Contractor shall be responsible for maintaining proper dust control during the course of construction per the Air Quality Management District (AQMD) standards.

7. All entrances and exits of work and storage areas shall be inspected on a daily basis. Any dirt, dust, or debris leaving the project site will be the sole responsibility of the Contractor to correct immediately upon occurrence.

B. TERMINATION

1. At the end of the project, the Contractor shall be responsible for removal of all temporary BMP measures, all construction related materials, equipment, trash/litter/debris, portable toilets, stockpiles of materials and any trash and concrete washout containers. The Contractor is responsible to re-install, plant, repair or replenish, any vegetation, landscaping or permanent structure damaged or disturbed during the course of construction of which is not called out or listed on the bid documents and plans.

C. REFERENCES


3. San Diego County Ordinance No. 9424  
(Watershed Protection, Stormwater Management and Discharge Control)

1.15 PROTECTION OF EXISTING UTILITIES

The Contractor shall coordinate their efforts with the District and shall take every precaution to protect all existing utilities and structures at the project site. The Contractor shall be responsible for all Underground Service Alert notification and mark outs prior to the beginning of work.

1.16 COORDINATION WITH DISTRICT OPERATIONS

A. The Contractor shall coordinate all work with the District sufficiently ahead of time so as to not interfere with the District's operation of their system. The Contractor shall submit a detailed sequence of work to the District for all work. This proposed sequence of work shall be reviewed with the District prior to construction for consistency with the Sequence of Work as described in these Contract Documents and the District’s required operation and shut-down plan.

B. The District will operate all existing valves and electrical breakers. The District will lock out and tag out clarifier motors. Contractor is responsible for ensuring that all necessary connections required to be isolated for the work have been safely de-energized including but not limited to confirming motors are disconnected. Contractor must coordinate all work with the District ensuring adequate notification is given for scheduling the isolations required. A minimum of 14-calander day’s notification is required for each installation milestone including, but not limited to, equipment calibration, start-up, and testing. Once the facilities have been isolated, the Contractor shall make all disconnections required for work to proceed.

C. The Contractor shall coordinate with the District’s bypass operation necessary for replacement of the clarifier motor assemblies such that the Contractor shall not damage, hamper, or impede hoses, pumps, and wiring to perform the work.

1.17 PRE-CONSTRUCTION CONFERENCE AND PROGRESS MEETINGS

A Pre-Construction Conference shall be scheduled prior to start of project. The District, the Contractor, and the District's Construction Manager shall be present. The Contractor's detailed sequence of work and a list of labor, material and equipment rates for additional work shall be established and maintained throughout the project. Contractor shall identify all personnel assigned to the project and a complete set of approved submittal data for use by inspection personnel. Contractor shall have a designated representative for this project.

The Contractor shall also attend progress meetings as described in Specification Section 13100 Clarifier Drive Replacement.

1.18 HOURS OF WORK

Hours of work shall be 7:00 A.M. to 3:30 P.M. Saturday and nighttime work will only be allowed with prior written approval by the Owner. If allowed, nighttime work hours shall be 9:00 P.M. to 6:00 A.M. Overtime and shift work may be established as short-term procedure by Contractor with written notice to and written permission from Owner. Absolutely no
equipment shall be started or warmed up prior to 7:00 AM or after 3:30 PM. No work other than overtime and shift work approved by Owner shall be done between the hours of 3:30 P.M. and 7:00 A.M., nor on weekends, or District recognized holidays, except such work as is necessary for the proper care and protection of the work already performed, except in case of emergency, and as specified herein. The District recognized holidays are as follows:

- Labor Day: Monday, September 7, 2020
- Veterans Day: Wednesday, November 11, 2020
- Thanksgiving Day: Thursday, November 26, 2015
- Day after Thanksgiving: Friday, November 26, 2020
- Christmas Day: Friday, December 25, 2015
- New Year’s Day: Friday, January 1, 2016
- Martin Luther King Day: Monday, January 18, 2021
- Presidents’ Day: Monday, February 15, 2021
- Memorial Day: Monday, May 31, 2021
- Fourth of July: Monday, July 5, 2021 (observed)

1.19 CONSTRUCTION WATER

A. The District will provide access to construction water at the site. All water used shall be paid for by the Contractor. The Contractor shall be responsible for all highlines and other temporary equipment and facilities necessary to meter and convey adequate construction water to the project site. The Contractor shall coordinate the locations of water supply with the District.

1.20 POWER AND LIGHTING

A. The Contractor shall provide all power required for construction operations, and shall provide and maintain all temporary power facilities required to perform the work in a safe and satisfactory manner. All electrical facilities shall conform to the requirements of the of the requirements of Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders, of the California Code of Regulation; and Subpart K of the OSHA Safety and Health Standards for Construction.

B. The Contractor shall provide adequate light for work conducted at night or under low light conditions to provide adequate facilities for inspection and safe working conditions and to insure proper work.

C. Temporary connections for electricity shall be subject to approval of the District's Representative. Remove temporary electrical connections in like manner prior to final acceptance of the work.

1.21 CONTRACTOR STAGING AND LAYDOWN AREA

The District will identify and provide space on the site for staging. The Contractor shall be responsible for returning the area used to their original conditions.
1.22 DUST CONTROL AND CLEANUP

A. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning or sweeping and sprinkling with water or other means as necessary, in accordance with the San Diego Air Pollution Control District's regulations. The use of water resulting in mud on public streets and/or private property will not be permitted as a substitute for cleaning, sweeping, or other methods. Every day, and as required by the Owner's Representative, the Contractor shall furnish and operate a motorized, self-loaded sweeper with water spray nozzles to keep paved areas affected by the work acceptably clean and dust free.

B. The Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish. Contractor shall provide adequate trash receptacles about the site, and shall promptly empty the containers when filled. Wastes shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams, or waterways. All wastes shall be removed from the site and disposed of in a manner complying with local ordinances and antipollution laws. Volatile wastes shall be properly stored in covered metal containers and removed daily. Construction materials shall be neatly stacked by the Contractor when not in use. The Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

1.23 SANITATION AND DRINKING WATER

A. The Contractor shall provide toilet and wash-up facilities for his work force at the site of work. They shall comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps. The facilities shall be stored within the staging areas overnight and on weekends. The Contractor shall maintain the sanitary facilities in an acceptable condition from the beginning of work to completion and shall remove the facilities and disinfect the premises.

B. The Contractor shall provide safe drinking water at all times at the jobsite.

1.24 SAFETY

A. Owner and its inspectors, consultants, agents and other representatives are in no way responsible for safety and are there only to observe the work compliance with plans and specifications.

B. The Contractor acknowledges responsibility for jobsite and acknowledges that the District, Engineer and their agents, employees, consultants and representatives will not have any such responsibility. To the fullest extent permitted by law the Contractor shall indemnify, defend and hold harmless the District, Engineer, their present companies, subsidiaries, agents, and employees from and against all claims, damages, losses and expenses, including but not limited to attorney fees and claim costs, arising out of or resulting from performance of work by the Contractor, its subcontractors, or their agents and employees, which results in damage, loss or expense is caused in whole or in part by the negligence, active or passive, or District, Engineer, their parent and subsidiary companies, as well as their agents and employees, excepting only the sole negligence of District, Engineer, their parent or subsidiary companies and their agents and employees.
1.25 ACCESS OF DISTRICT’S REPRESENTATIVE TO CONFINED SPACES IN STRUCTURES UNDER CONSTRUCTION

A. The Contractor shall be aware that some or all portions of the work may be designated as a PERMIT REQUIRED CONFINED SPACE. The Contractor is required to provide the Owner with a copy of the Contractor’s Confined Space Program for Owner’s review and acceptance prior to beginning work. Contractor’s Confined Space Program shall be in compliance with Cal-OSHA’s Confined Space regulatory requirements. The Contractor is required to perform all work in accordance with Cal-OSHA Confined Space requirements and Title 8, Subchapter 20 “Tunnel Safety Orders”.

B. The Contractor shall provide the following assistance to the personnel of the District’s Representative when said personnel must enter confined spaces in structures under construction or structures which have not been accepted by the District.

1. Training program for the personnel of the District’s Representative relevant to the specific structures being entered.

2. Testing equipment and personnel to operate said equipment for testing the atmosphere in the confined spaces for oxygen deficiency, explosive gases, and toxic gases.

3. Authorized competent person to stand by each confined space while entrants are inside the space.

4. Safety equipment (breathing apparatus, harnesses, and rescue equipment) in good working order.

5. Communication equipment.

6. Access equipment (hoists and ladders).

7. Signs.

8. Alarm system.

9. Ventilation system.

C. The Contractor shall identify confined spaces on the project, mark them with warning signs per CAL/OSHA requirements, and notify the District’s Representative that these structures now exist.

1.26 INDEMNIFICATION

A. Contractor hereby releases and agrees to indemnify, defend, hold harmless the District, Engineer, their parent and subsidiary companies, agents, employees, consultants and representatives for any and all damage to persons or property or wrongful death regardless of whether or not such claim, damage, loss or expense is caused in whole or in part by the negligence, active or passive, of District, Engineer, their parent and subsidiary companies, as well as their agents and employees, excepting only the sole negligence of District, Engineer, their parent or subsidiary companies and their agents and employees to the fullest extent permitted by law. Such indemnification shall extend to all claims, demands, actions, or liability for injuries, death or damages occurring after completion of the project, as well as during the work’s progress. Contractor further agrees that it shall accomplish the
above at its own cost, expense and risk exclusive of and regardless of any applicable insurance policy or position taken by any insurance company regarding coverage.

B. Contractor shall defend, indemnify and hold the District, Engineer, its employees, officers, or agents, harmless against any and all claims by any parties arising from, or related to, any and all damages, including legal costs and attorney’s fees, resulting from interference with, interruption of, damage to, or any and all injuries which result from damage caused to subsurface installation, which is unforeseen and despite Engineer’s/Architect’s effort during the design process was not located, excepting only the gross negligence or willful misconduct of Engineer in providing its services.

1.27 AUDIO-VIDEO AND PHOTOGRAPHIC DOCUMENTATION OF PROJECT SITE

A minimum of one (1) week prior to start of construction and delivery of any equipment, materials or supplies to the site, the Contractor shall provide pre-construction digital color audio-video and photographic documentation as specified herein for the purpose of establishing the surface conditions existing in all of the areas to be affected by the construction and to avoid potential construction repair disputes. The Contractor shall be responsible for repairing any damage or defect not documented as existing prior to construction.

Coverage of the digital color audio-video and photographic documentation shall include, but not be limited to: all existing pavement, concrete, tanks, sidewalks, curbs, landscaping, trees, catch basins, fences, monuments, visible utilities and all buildings located within the zone of influence.

Two (2) copies of the digital color audio-video and photographic documentation shall be provided to the Owner’s Representative on DVD, USB Flash Drive or other electronic data storage device suitable to the Owner prior to the start of construction. Construction work shall not commence until audio-video and photographic documentation has been delivered to the Owner’s Representative.

1.28 NOTICE OF COMPLETION

Contractor shall apply for acceptance of the work encompassed in Bid Items 2, 3, and 4. Upon substantial completion of the work encompassed in Bid Items 2, 3, and 4, the District, at the District’s sole discretion, will issue a Notice of Substantial Completion for this work.

Upon completion of all work in Bid Items 1, 2, 3, and 4, Contractor shall apply for acceptance of the work. Upon acceptance of the work encompassed in Bid Items 1, 2, 3, and 4 the District, at the District’s sole discretion, will issue a Notice of Completion for this work.

1.29 GUARANTEE

For all work a two-year guarantee shall be furnished by the Contractor as required in the General Provisions, Article 5-14, except that any guarantee included for materials or equipment beyond the period specified herein shall be solely the responsibility of the guarantor and not the Contractor. This guarantee period shall commence with the District’s issuance of a Notice of Substantial Completion.
1.30 LABOR COMPLIANCE PROGRAM AND CONTRACTOR REGISTRATION WITH STATE OF CALIFORNIA

In accordance with requirements defined by the California State Legislature via Senate Bill 854, all contractors and subcontractors involved with public works project shall be registered with the State Department of Industrial Relations. Registration is completed through an on-line application process and the payment of a fee to the State. The registration process requires contractors and subcontractors to provide workers’ compensation coverage to its employees, hold a valid Contractors State Board License, have no delinquent unpaid wage or penalty assessments, and not be subject federal or state debarment. The registration form is located on the State Department of Industrial Relations website:

http://www.dir.ca.gov/DLSE/dlsepublicworks.html

Prior to start of construction, the Contractor shall submit to the District evidence of completing this registration for the prime firm and all subcontracting firms. Failure to submit the requested documentation shall be cause for delay of the project and subject to forfeiture due to delay in accordance with paragraph 1.07 of the Supplement to General Provisions.

This project is subject to monitoring by the Compliance Monitoring Unit (CMU) of the California Department of Industrial Relations (DIR). The Owner will be implementing and enforcing a labor compliance program (LCP) to ensure compliance with provisions of the California Labor Code. The Contractor must post a jobsite notice starting that the project is subject to CMU monitoring.

1.31 OWNER’S RIGHT TO STOP WORK

The Owner reserves the right to stop work for any reason, at any time. The Contractor's claim for compensation shall apply to an adjustment in the completion time of the project only. Any additional costs incurred due to any stop work order, shall be incurred by the Contractor.

1.32 HAZARDOUS WASTE

The Contractor shall perform work in such a manner that there will be no hazardous wastes (fuel, oil, chemical, etc.) generated or left on the site. Should the generation of hazardous waste be necessary in order to complete the Work, it shall be the Contractor's responsibility to take all necessary steps to legally dispose of the waste and any contaminated soil or material. All hazardous waste and/or contaminated soil found on the site which has been left by the Contractor shall be properly disposed of by the Contractor. All necessary documentation of the disposal shall be obtained by the Contractor and shall be submitted to the Owner.

END OF SECTION
PART II

TECHNICAL SPECIFICATIONS
SECTION 01047
OWNER-PROCURED EQUIPMENT

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. This Section defines the relationships of the duties and responsibilities of the equipment System Supplier the Contractor, and the District for the delivery, storage, installation, and startup of OWNER-procured equipment

1.2 RELATED SECTIONS

A. The Work of the following Sections apply to Work of this Section. Work of other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of the Work.

1. Section 01150 - MEASUREMENT, PAYMENT AND SCHEDULE OF VALUES
2. Section 01545 - PROTECTION OF THE WORK AND PROPERTY
3. Section 13100 - CLARIFIER DRIVE REPLACEMENT

1.3 DEFINITION

A. SYSTEM SUPPLIER: The District has purchased the new drives from the District's System Supplier. The Contractor shall retain the services of its own qualified System Supplier and perform the Work under the supervision of the Contractor’s System Supplier as specified herein and as required for removal of the existing clarifier drives, motors and ancillary hardware and complete installation of the new drives, motors and ancillary hardware.

The Contractor shall provide all labor, services, equipment and materials for installation of the replacement drives and ancillary work as described in the Contract Documents.

1.4 INSPECTION AND TRANSFER OF CUSTODY

A. The District has pre-purchased (2) clarifier drive and motor assemblies equivalent to the existing EIMCO C30HT drives units located on the 65' diameter secondary clarifiers. The pre-purchased equipment is rated the same as existing as it relates to torque, speed and HP.

<table>
<thead>
<tr>
<th>OEM ORDER</th>
<th>OEM ORDER NO.</th>
<th>OEM ORDER YEAR</th>
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<tbody>
<tr>
<td>Eimco (Baker Process)</td>
<td>BAP0207-500</td>
<td>2017</td>
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</tbody>
</table>

B. The Contractor and the District shall make a joint inspection of the condition of each piece of equipment and shall note, in writing, the defects in said equipment. Damage or loss of equipment and materials after the date of their transfer to the Contractor shall be repaired or
replaced at the Contractor’s expense. At the Contractor’s own expense, they shall consider their qualified System Supplier be present at the joint inspection.

C. After the joint inspection is complete, the Contractor shall assume custody of the pre-purchased equipment upon mobilization at the Project site and shall assume liability for damage to the equipment thereafter including during transfer of the equipment from storage at the WRF to the secondary clarifier area in preparation for installation.

1.5 SITE STORAGE

A. The District pre-purchased equipment is currently being stored at the District’s 4S Ranch Water Reclamation Facility, 16595 Dove Canyon Rd, San Diego, CA 92127.

B. The District will allow storage of the pre-purchased material, at the Contracts risk, in its current storage location until the Contractor is ready to install the equipment.

C. Contractor shall provide the equipment for removal and handling of the pre-purchased equipment, with the advice of the Contractor’s System Supplier.

D. Once removed from District storage, the Contractor shall properly store and maintain equipment according to written instructions submitted to the District from the Contractor’s System Supplier.

E. Contractor shall be responsible for site security and on-site storage in accordance with submitted System Supplier’s instructions.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION

3.1 INSTALLATION

A. System Supplier Representation: The Contractor shall provide the services of a qualified factory trained representative of the System Supplier for the following:

1. EQUIPMENT REMOVAL AND INSTALLATION: A minimum of two (2) trips to the WRF for clarifier drives and motor installation. Each trip shall be for a minimum of two (2) eight-hour work days onsite to observe and advise on removal of existing units, installation of the pre-purchased units and placing the new units in operation. Additional trips necessary to facilitate the removal and installation shall be at the Contractor’s expense.

2. CONFIRMATION OF WARRANTY PERIOD: The Contractor shall provide the services of a qualified System Supplier as necessary so the Contractor’s System Supplier can confirm the pre-purchased equipment has been properly installed and tested in conformance with the Contractor’s System Supplier approved Removal and Installation Procedures and Testing Plan as identified in Section 13100. The Contractor’s System Supplier shall provide a two (2) years equipment warranty.
B. CONTRACTOR's Responsibilities:
1. The Contractor shall install and connect the equipment in accordance with detailed instructions from the Contractor's System Supplier.
2. The Contractor shall unload upon delivery and install OWNER-procured equipment complete with drives, motors, supports and appurtenances as shown on the Drawings and specified herein.
3. The Contractor shall be responsible for all costs associated with providing a qualified System Supplier.

3.2 FIELD QUALITY CONTROL

A. CONTRACTOR's Responsibilities:
1. The Contractor's System Supplier shall confirm that the pre-purchased equipment has been properly installed and tested such that a two (2) year equipment warranty provided by the Contractor's System Supplier. The Contractor shall obtain a letter from a qualified System Supplier on the System Supplier’s letterhead and signed by a duly authorized representative stating that the pre-purchased equipment has been installed and tested properly and that the equipment warranty will remain in force through the warranty period.
2. Prior to testing, Contractor shall verify that driven equipment is properly installed and required safety equipment, mechanical couplings, specified controls and instrumentation, and other required equipment have been installed.

3.3 EQUIPMENT CALIBRATION, START-UP, AND TESTING

A. Contractor shall energize and test the pre-purchased clarifier drives and motors. Contractor shall perform preliminary field tests of the installed pre-purchased drives and motor assemblies as soon as conditions permit and as recommended by the Contractor's qualified System Supplier. The preliminary tests are to determine if equipment is properly installed, operational and free from overheating, overloading, vibration or other operating problems. Contractor shall make all changes, adjustments and replacements required to place equipment in service and to test it. Preliminary and operational testing procedures shall be included in the Testing Plan identified in Section 13100.

B. The Contractor shall have and ensure that the System Supplier provides a qualified manufacturer's factory trained representative for equipment checkout and testing. The System Supplier’s representative shall provide the minimum site support as identified in Part 3.1.A.1 of this Section to observe and advise on installation; and to observe, advise and assist in start-up and testing for each pre-purchased clarifier drive and motor.

C. Contractor shall provide a Start-up and Testing Plan for the start-up of the OWNER-procured equipment as specified in Section 13100.

D. Contractor shall coordinate start-up schedule with District and System Supplier.
SECTION 01047
OWNER-PROCURED EQUIPMENT

E. Contractor shall operate and inspect the OWNER-procured equipment for a period of eight (8) hours each.

END OF SECTION
MEASUREMENT, PAYMENT AND SCHEDULE OF VALUES

PART 1 - GENERAL

1.1. DESCRIPTION

A. The items described below in Paragraph 1.4 - Pay Items refer to and are the same pay items listed in the Bid Form. They constitute all pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, Contractor's field offices, job signs, sanitary requirements, testing, safety devices, shop drawings, record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, and all other requirements of the Contract Documents. Compensation for all such services, materials, and items shall be included in the prices stipulated for the lump sum or unit price pay items listed herein.

B. The lump sum bid prices and unit cost bid prices will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

1.2. SCOPE

A. Payment shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies and manufactured articles and for all labor, operations and incidentals that are appurtenant to the items of Work and necessary to complete the various items of Work in accordance with the requirements of the Contract Documents. This shall include all appurtenances and the costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).

1.3. BREAKDOWN OF CONTRACT PRICE OF LUMP SUM CONTRACTS

A. Prior to the execution of a lump sum contract, the Contractor shall submit a detailed price breakdown showing the allocated portion of the total bid price to the various items of Work. Contractor must submit a preliminary price breakdown for the review and approval of the District. The District reserves the right to reject any breakdown submitted by the Contractor which the District judges insufficient to allow for the preparation of accurate monthly progress payment estimates or extra work similar in nature to the Work included in the Contractor's bid. The detailed price breakdown shall be listed by specification section number and shall include a separate cost item for all items of equipment or work. The price breakdown shall typically be a unit price type breakdown and shall include quantities, unit prices and total bid cost for each cost item. Where a unit price breakdown is judged impractical, the District may allow a breakdown by lump sum for certain cost items. This information will be used by the District in preparing monthly progress payment estimates.

1.4. PAY ITEMS

A. Base Bid – Schedule A

1. Mobilization, Demobilization, Bonds, Permits, Insurance, & Cleanup
(a) Payment shall include compensation for all labor, materials, tools and equipment including, but not limited to, the following principal items: obtaining and complying with permits not included in any other bid item; mobilizing labor force, equipment and construction facilities; providing the required insurance; providing Contractor field offices and power/lighting, if required; providing on-site sanitary facilities; securing a water supply; implementation of BMP’s; posting OSHA requirements and establishing safety programs; daily cleanup; preparing the Schedule of Values prior to the pre-construction meeting; pre-construction audio-video and photograph documentation; work not specified for payment in any other bid item; and all incidentals for the mobilization, demobilization, and permitting for construction of the project as described in the Contract Documents.

Earthquake & Tidal Wave Insurance is not required.

Payment for this item shall be limited to ten (10) percent of the total contract price.

2. SYSTEM SUPPLIER Services

(a) Payment shall include all direct costs incurred by the Contractor for providing the services of a qualified SYSTEM SUPPLIER as identified in the Contract Documents and as required to complete the Work.

3. Clarifier Drive and Motor Assembly No. 1 Removal and Installation

(a) Payment shall include all scheduling, labor, materials, tools, equipment and incidentals for the: 1) removal of existing clarifier bridge, electrical service, utility service, drive and motor assembly and incidentals, and 2) transport, installing, start-up operation and field testing of the first (1st) of two (2) pre-purchased clarifier drive and motor assemblies (District pre-purchased equipment), along with the reinstallation of Contractor removed clarifier bridge, electrical service, utility service and incidentals as described in the Contract Documents. Contractor shall replace any nuts, bolts, and washers removed from the existing clarifier drive and motor assembly and as necessary to install the new clarifier drive and motor assembly with new 316 SS material.

4. Clarifier Drive and Motor Assembly No. 2 Removal and Installation

(a) Payment shall include all scheduling, labor, materials, tools, equipment and incidentals for the: 1) removal of existing clarifier bridge, electrical service, utility service, drive and motor assembly and incidentals, and 2) transport, installing, start-up operation and field testing of the second (2nd) of two (2) pre-purchased clarifier drive and motor assemblies (District pre-purchased equipment), along with the reinstallation of Contractor removed clarifier bridge, electrical service, utility service and incidentals as described in the Contract Documents. Contractor shall replace any nuts, bolts, and washers removed from the existing clarifier drive and
motor assembly and as necessary to install the new clarifier drive and motor assembly with new 316 SS material.

B. Add Alternate Bid – Schedule B

1. Conduit Removal and Replacement for Clarifier Drive and Motor Assembly No. 1

   (a) Payment shall include all scheduling, labor, materials, tools, equipment and incidentals for the removal and replacement of existing electrical and control conduit on the clarifier bridge including, but not limited to, pre-removal testing, disposal, submittals, connectors, post installation testing and incidentals for the first (1st) of two (2) pre-purchased clarifier drive and motor assemblies as described in the Contract Documents.

2. Conduit Removal and Replacement for Clarifier Drive and Motor Assembly No. 2

   (a) Payment shall include all scheduling, labor, materials, tools, equipment and incidentals for the removal and replacement of existing electrical and control conduit on the clarifier bridge including, but not limited to, pre-removal testing, disposal, submittals, connectors, post installation testing and incidentals for the second (2nd) of two (2) pre-purchased clarifier drive and motor assemblies as described in the Contract Documents.

1.5. SCHEDULE OF VALUES

A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional Work or credits which may arise during the construction.

B. The Schedule of Values shall, at a minimum, be based on the Pay Item breakdown presented herein. The schedule shall show breakdown of labor, materials equipment and other costs used in preparation of the Bid.

C. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

D. A tentative schedule of values shall be submitted prior to or at the pre-construction conference in accordance with Section 13100. After review by the District, the Contractor shall revise and resubmit schedule as required until it is approved.

END OF SECTION
PART 1 - GENERAL

1.1. GENERAL

A. Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.

B. To prevent damage, injury or loss, Contractor's actions shall include but not be limited to, the following:

1. Store apparatus, materials, supplies and equipment in an orderly safe manner that will not unduly interfere with the progress of the Work or the operation of the WRF.

2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.

3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.

4. Clean up daily all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance. Perform major cleaning every Friday, or Thursday if Friday is a holiday.

5. Provide barricades and guard rails around temporary access, around cranes, or other hazardous areas.

C. Contractor shall assume full responsibility for the preservation of all public and private property or facility on the site. If any direct or indirect damage is done by or because of any act, omission, neglect or misconduct in the execution of the Work by the Contractor, it shall be restored by the Contractor, at his expense, to a condition equal to that existing before the damage was done.

1.2. PROTECTION OF EXISTING STRUCTURES

A. Surface Structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

B. Protection of Structures:

1. Contractor shall sustain in their places and protect from direct or indirect injury all structures located within or adjacent to the limits of the Work.

2. Contractor shall assume all risks attending the presence or proximity of all structures within or adjacent to the limits of the Work. Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure.
Contractor shall repair immediately all damage caused by his Work, to the satisfaction of the District.

3. All other existing facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at Contractor's expense.

1.3. PROTECTION OF INSTALLED PRODUCTS

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.

B. Control traffic to prevent damage to equipment, materials and surfaces.

1.4. RESURFACING

A. The Contractor shall protect all paving, roadways and surface improvements from the use of heavy equipment and machinery such as cranes and other mechanical lifting equipment. Contractor shall promptly repair all damage caused by his Work, to the satisfaction of the District. The Contractor shall restore all damaged paving, roadways and surface improvements, at his expense, to a condition equal to that existing before the damage was done.

1.5. PROTECTION OF TREES AND LANDSCAPING

A. The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs or other existing landscaping, including those lying within or beyond street rights-of-way and project limits, and shall not trim or remove any trees. All existing trees and landscaping which are damaged during the construction shall be trimmed or replaced by the Contractor or a certified landscape maintenance company to the satisfaction of the District. All costs shall be borne by the Contractor.

END OF SECTION
PART 1 - GENERAL

1.1. DESCRIPTION

A. SUMMARY: The Olivenhain Municipal Water District (District) owns and operates the 4S Ranch Water Reclamation Facility (WRF). The WRF’s treatment process includes two (2) circular secondary clarifiers, each with a sixty-five (65) foot interior diameter.

The existing clarifiers have been in operation at the WRF for approximately eighteen (18) years. The clarifier drive units need to be replaced with new units which the District has pre-purchased and housed at the WRF.

1.2. CONTRACT SPECIFICATIONS

A. The Contract Specifications for installation of the pre-purchased clarifier drive and motor assemblies and ancillary work.

1. Section 01047 – OWNER PROCURED EQUIPMENT
2. Section 01150 - MEASUREMENT, PAYMENT AND SCHEDULE OF VALUES
3. Section 01545 - PROTECTION OF THE WORK AND PROPERTY
4. Section 13100 - CLARIFIER DRIVE REPLACEMENT

1.3. REFERENCE CODES AND STANDARDS

A. Without limiting the generality of other requirements of the specifications, all Work specified herein shall conform to or exceed the requirements of all applicable codes, including but not limited to, the applicable requirements of the documents identified herein, to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.

B. Contractor shall perform the Work in accordance with, but not necessarily limited to codes and standards identified herein. Contractor shall comply with requirements and recommendations stated in that standard, except when they are specifically modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work.

C. No provisions of any referenced standard specification, manual or code, whether or not specifically incorporated by reference in the Contract Documents, shall be effective to change the duties and responsibilities of the District or Contractor from those set forth in the Contract Documents. Nor shall they be effective to assign to the District any duty of authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.
D. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflict shall be brought to the attention of the District for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.

E. Reference standards include, but are not necessarily limited to, the following:

1. Standard Specifications for Public Works Construction (SSPWC), Current Edition (Greenbook), including the County of San Diego Regional and City of San Diego Supplement Amendments.


4. "Cal-OSHA" - State of California, Department of Industrial Relations, Construction Safety Orders, as amended to date, and all changes and amendments thereto which are effective as of the date of construction.


6. All other applicable standards listed in the Specifications, and the standards of utility service companies, where applicable.

1.4. SCOPE OF WORK:

A. The Contractor shall replace two (2) existing clarifier drives and motors with pre-purchased units. The District will take each of the clarifiers off-line, one at a time, and drain the respective tank and install a bypass system prior to removal of the existing drives and motors by the Contractor for replacement. The Contractor shall schedule the Work with the District such that only one clarifier will be off-line at a time and will allow a minimum of two (2) working days between clarifiers being taken off-line and washed down by the District. The Contractor shall provide 14 calendar days' notice before clarifiers are to be taken off-line. The Contractor shall be responsible for disconnection, replacement, and protection of all power and utility connections from the clarifier bridge structure as necessary for the removal of existing drives and motors and replacement with the District's pre-purchased units. Contractor shall be responsible for furnishing all crane and lifting equipment for removal of the clarifier bridges, removal of existing drives and motors, installation of the pre-purchased drives and motors and replacement of the clarifier bridge, power connections and utility services. The Scope of Work under this contract for each of the clarifier drives and motors includes the following major tasks to be done by the Contractor:
1. Furnish all labor, equipment, and materials to inspect and transport the two (2) pre-purchased clarifier drives and motors from storage at the WRF to a District approved location near the secondary clarifiers in preparation for installation on the clarifier mechanisms.

2. Furnish all labor, equipment, and materials needed to disconnect power and controls, and process connections to the clarifier bridge, drives and motors. Perform isolation test before disconnection per Section 2.2.

3. Furnish all labor, equipment, and materials to dismantle and remove the clarifier drives, bridges and associated handrails, walkways, power and control conduit and wires, piping, process connections, etc., including, but not limited to, crane, mats and rigging equipment as needed.

(a) If Add Alternate Bid Schedule B is executed, remove all conduit and connections per the Specifications.

4. Furnish all labor and equipment to drain oil from the existing drives and dispose of the oil off-site at an approved location at the Contractor’s expense.

5. Furnish all labor, equipment and materials needed to replace any existing anchor bolts, nuts, and washers and other hardware as required to remove and subsequently replace the clarifier bridges, drives and motors. Replacement material shall be 316 stainless steel.

6. Furnish all labor and equipment needed to clean, prepare for transport and deliver to the District’s System Supplier the existing clarifier drive units. Preparation and shipping of existing clarifier drive and motor assemblies after removal by the Contractor is as identified in Part 3.8 of this Section.

7. Furnish all labor, equipment, and pay all disposal fees, for removal and legal disposal of any discarded parts left on-site at the WRF as part of the existing equipment removal process.

8. Furnish all labor and equipment needed to temporarily seal and protect all electrical and process connections left exposed by the removal of the clarifier bridges, drives and motors. All damaged materials to be replaced.

9. Furnish all labor, equipment, and materials to cover/protect the exposed threaded anchors for the removal of the clarifier bridges, drives and motors.

10. Contractor shall inspect the existing anchor bolts after removal of the bridge and clarifier drives in the presence of the District and shall submit an inspection report to the District. If inspection of the anchors indicates substantial deterioration of the existing anchors, and/or deterioration of the concrete to which anchors are installed or embedded, Contractor shall furnish all labor to design, furnish and install new AISI 316 SS drill-and-epoxy adhesive anchor bolts or an alternate anchorage system for the reinstallation of the clarifier bridges, drives and motors as specified in Part 3.9 of this Section. Payment for anchor bolt replacement, if required, shall be on a time and materials basis.
11. Furnish all labor, equipment and materials to install the pre-purchased clarifier drives and motors on the original clarifier mechanism mounting plates including rake and drive leveling and replacement of nuts, washers, connectors and appurtenances as needed, including, but not limited to all new ancillary 316 SS nuts, bolts, and washers.

12. Furnish all labor, equipment and materials to reinstall clarifier bridges, handrail, walkways, power and control conduit and wires, piping and process connections, including, but not limited to, crane, mats and rigging equipment as needed, including, but not limited to all new ancillary 316 SS nuts, bolts, and washers.

(a) If Add Alternate Bid Schedule B is executed, install all new conduit and connections per the Specifications.

13. Furnish all labor, equipment, and materials needed to connect power and controls, and process connections to the pre-purchased clarifier drives and motors including, but not limited to the replacement of power and control conduit and wiring if damaged. Perform isolation test after re-connection per Section 2.2.

14. Furnish all labor and material to fill the drive boxes with oil in accordance with the Contractor’s System Supplier’s recommendations. Service all chains, gears, bearings and other moving components with lubricant in accordance with the Contractor’s System Supplier’s recommendations.

15. Furnish all labor, equipment and material needed to refill the pre-purchased clarifier drives with hydraulic oil in accordance with the recommendations of the Contractor’s System Supplier.

16. Energize and Test the pre-purchased clarifier drives and motors. Contractor shall preform preliminary field tests of the installed pre-purchased drives and motor assemblies as soon as conditions permit and as recommended by the System Supplier. The preliminary tests are to determine if equipment is properly installed, operational and free from overheating, overloading, vibration or other operating problems. Contractor shall make all changes, adjustments and replacements required to place equipment in service and to test it. Preliminary and operational testing procedures shall be included in the Testing Plan identified in Paragraph 1.10.B.11.

17. Furnish all labor, equipment and materials for Submittals as specified in Part 1.10 of this Section.

18. Furnish all safety equipment, materials and training needed for the execution of the Work as specified herein.

19. Furnish all labor, equipment and materials for Field Services as specified in Part 3 of this Section.

20. Contractor shall provide all necessary temporary first aid and sanitary facilities.

1.5. REFERENCE DOCUMENTS
A. Photographic Exhibits: Photographic Exhibits depicting the District pre-purchased clarifier drive and motor assemblies are provided as Appendix A. The photographic information is for the Contractor’s general information only. It is the Contractor’s responsibility to confirm all dimensional information and points of connection through field measurements and coordination with the Contractor’s qualified System Supplier and include all costs for coordination in his Bid.

B. Existing Reference Drawings: Existing Reference Drawings for the original secondary clarifiers at the WRF are included in Appendix A.

The Existing Reference Drawings are included for the Contractor’s general information and the District shall not be responsible for their completeness or accuracy relative to existing conditions. Changes that may have been done to the WRF facilities after the original installation may not be reflected in the Existing Reference Drawings. The Contractor shall assess existing conditions impacting the Contractor’s work under this Project and shall reflect conditions impacting the Contractor’s work in the Contractor’s submittals.

C. Equipment Numbering: The original District purchase order for the existing OEM drives is Baker Process No. 3941002 (EIMCO Process Equipment Company formerly a part of Baker Process, now operating as EIMCO Water Technologies a part of OIVIVO). The clarifier drives shown on the Reference Drawings are identified according to the following equipment numbers:

<table>
<thead>
<tr>
<th>Existing Equipment Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Clarifier Drive No. 1</td>
</tr>
<tr>
<td>Clarifier Drive No. 2</td>
</tr>
</tbody>
</table>

1.6. SITE SAFETY

A. The responsibility for safety for all work done by and under the control of the Contractor lies solely with the Contractor.

1. The Contractor shall be required and responsible for complying with all applicable Federal and State OSHA regulations, codes and ordinances.

2. The Contractor shall furnish and install safety equipment required by all applicable regulations, codes and ordinances for all work performed by the Contractor and all work under the control of the Contractor including but not limited to fall protection barriers and barricades; and PPE fall arrest safety equipment for all personnel working within the interior structure of the clarifier mechanisms, and all work done at heights exceeding the height limits established by OSHA for the use of PPE fall arrest safety equipment.
3. Prior to starting Work, Contractor shall submit proper documentation to the District confirming that all Contractor field personnel engaged in the Work have received training and certification related to fall protection and any other relevant safety certifications required by State or Federal OSHA regulations, codes and ordinances.

1.7. QUALITY ASSURANCE

A. Prior to mobilization, the Contractor shall confirm with a qualified System Supplier that all system components and hardware required for installation of the new drives and motors have been delivered to the site. Contractor shall notify the District of any components or hardware that is not on-site and is required for complete installation and operation of the new clarifier drives and motors. Anchor bolt replacement requirements is discussed in Part 3.9 herein.

B. The Contractor shall verify all dimensions in the field and shall check field conditions prior to the beginning of field work, including all electrical replacements and connections. The Contractor shall be solely responsible for any inaccuracies built into the Work due to its failure to comply with this requirement.

C. The Contractor shall inspect related and appurtenant Work and shall report in writing to the District any conditions which will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at its sole cost and expense.

1.8. QUALIFICATIONS OF THE CONTRACTOR

A. GENERAL: The Contractor shall submit written evidence demonstrating compliance with the minimum qualifications listed below.

1. Contractor’s License – State of California CONTRACTOR’S LICENSE, CLASSIFICATION A or B.

2. Evidence that the business entity has been in continuous operation over the last 10 years in construction, repair or equipment servicing of process equipment at publicly owned water or wastewater treatment facilities.

3. Evidence of successful completion of five (5) projects in the last 10 years involving process equipment installation at a publicly owned wastewater treatment plant. A written list of references will include project title, client name, and contact person serving as a reference with phone numbers and e-mail addresses

B. ELECTRICAL SUB-CONTRACTOR: The Contractor shall retain the services of an Electrical Sub-contractor licensed in the State of California who shall perform, under the direction of the Contractor, all electrical work associated with decommissioning, removal; and re-installation and re-commissioning of each clarifier drive and motor. Alternately, the Contractor can also assume the role of ELECTRICAL SUB-Contractor if the Contractor also possesses a State of California C-10 Electrical Contractor’s license.
C. SYSTEM SUPPLIER SUB-CONTRACTOR: The Contractor shall retain the services of a System Supplier licensed in the State of California who shall perform, under the direction of the Contractor, all work identified in the Contract Documents associated with removal and re-installation; testing and re-commissioning; and equipment warranty of each clarifier drive and motor. The System Supplier shall submit evidence that the business entity has been in continuous operation over the last 10 years in construction, repair or equipment servicing of process equipment at publicly owned water or wastewater treatment facilities and of successful completion of five (5) projects in the last 10 years involving EIMCO or equivalent clarifier motor assemblies. Alternately, the Contractor can also assume the role of SYSTEM SUPPLIER SUB-Contractor if the Contractor also possesses the required qualifications.

1.9. MAINTENANCE OF PLANT OPERATIONS AND CONSTRUCTION CONSTRAINTS

A. GENERAL: Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the operation of the existing District facilities and to the public. Work on existing structures and facilities shall be performed on a schedule and in a manner that will permit the existing facility to operate continuously, unless otherwise approved in writing by the District.

B. HOURS OF OPERATION: The WRF is operated on a 24 hour per day, 365 days per year basis. Plant Operations Staff are typically on site between the hours of 5:00 AM and 3:30 PM Pacific Time Monday through Sunday.

C. LEVEL OF SERVICE. At all times during the life of the contract, there shall be one of the two secondary clarifiers available for operation. The Contractor shall remove only one clarifier bridge, drive, motor and ancillary utility connections at a time and complete all reinstallation in accordance with the milestone schedules identified in Part 1.4 and 3.3. The District will determine the order in which the existing secondary clarifier drives shall be removed and new drives re-installed by the Contractor.

D. COORDINATION WITH PLANT STAFF: The Contractor shall schedule and coordinate all onsite work with the Plant’s Chief Operator.

1.10. SUBMITTALS

A. PROCEDURES

1. Complete drawings and data covering the items specified in Part 2.2 shall be submitted to the District for approval.

2. Electronic copies shall be submitted to the District within the timeframe established by the Contractor to complete all Work within the Time for Completion calendar days specified in Section 00810. The Contractor’s schedule as specified in Paragraph 3.2.A.2 of this Section shall include start and finish dates for all Contractor submittals.

3. The District will review and approve or provided comments on the Contractor submittals within fourteen (14) calendar days after receipt of the submittals.
4. The Contractor shall re-submit the submittals, when required, within seven (7) calendar days after receipt of District comments if the first submittal is not approved by the District. The District will review and provide comments or approve of the re-submittal within ten (10) calendar days after receipt of the re-submittal.

B. GENERAL SUBMITTALS: At minimum, the Contractor shall furnish submittals for the following items:

1. Contractor Qualifications as specified in Part 1.8 of this Section.

2. Schedule of Values as specified in Section 01150.

3. Schedule as specified in Part 1.4, Paragraph 3.2.A.2, and Part 3.4 of this Section, as well as elsewhere in the Contract Documents. The District will establish the order in which the two (2) clarifiers shall be taken out-of-service.

4. Safety Plan as specified in Part 1.6 and elsewhere as may be identified in the Contract Documents. The Safety Plan submittal shall be for the District’s Information only and the review of the plan by the District does not relieve or lessen the Contractor’s responsibility for site safety as described herein and as required by federal, state and local OSHA requirements, laws, codes and ordinances.

5. Certifications of Crane Operators and Lifting Plans as specified in Part 3.5 of this Section and elsewhere in the Contract Documents.


7. Specifications and product information for like-in-kind replacement components as identified in Part 2.2 of this Section. The District shall provide approval of like-in-kind products prior to installation by the Contractor.

8. Anchor bolt and attachment hardware condition assessment reports as specified in Paragraph 1.4.A.10 of this Section.


10. Removal and Installation Procedures for pre-purchased drives and motors as specified in Paragraph 1.10.D of this Section. Contractor to include any electrical systems materials to be replaced.

11. Testing Plans including rake and drive leveling procedures, checkout, preliminary testing and operational testing procedures for placing the pre-purchased drives and motors into service as specified in Part 3.10 of this Section.

12. Contractor shall provide releases from all parties who are entitled to claims against the District, property, or improvement pursuant to the provisions of law.
C. SAFETY AND SAFETY PLAN SUBMITTAL: The Contractor shall be responsible for all aspects of safety and OSHA compliance. The Contractor shall prepare and submit a Safety Plan that is specifically tailored to the risks connected with the work. The OWNER shall keep a copy of the Safety Plan on file as a reference. At minimum, the Safety Plan shall address the following items:

1. Fall Prevention and provisions to ensure worker safety during removal of existing drives and motors and installation of the pre-purchased drives and motors.

2. Electric Shock

3. Slippery and uneven surfaces due to presence of biosolids and washdown water.


D. REMOVAL AND INSTALLATION PROCEDURES: The Contractor shall submit step by step procedures for the removal of the existing drives, motors, bridge and utilities and ancillary items and reinstallation of said items. The procedures shall be reviewed by a qualified System Supplier prior to submittal to the District and shall include a statement from the System Supplier that the procedures are consistent with the requirements for maintaining Warranty on the pre-purchased equipment.

1.11. WARRANTY

A. All warranties shall be written to the benefit of the District, after final acceptance by the District of the work by the Contractor for each pre-purchased clarifier drive and motor and other Work as identified herein.

B. CONTRACTOR WARRANTY: In accordance with the requirements of the General Provisions and elsewhere, the Contractor shall warrant that all the materials, and workmanship furnished under this Contract will be as specified and will be free of defects due to faulty materials or workmanship for a period of two (2) years from the date of final acceptance by the District, following a determination by the District that the Contractor has complied with all the provisions of the Contract Documents for the installation and testing of each clarifier drive and motor.

C. VERIFICATION OF PRE-PURCHASED EQUIPMENT WARRANTY: The Contractor shall provide the services of a qualified System Supplier as identified in Section 01047 and elsewhere in the Contract Documents to confirm that the pre-purchased equipment has been properly installed and tested such that the equipment warranty provided by the Contractor’s System Supplier will remain in force through the equipment warranty period.

D. The performance bond shall remain in full force and effect through the entire warranty period for both clarifier drives and motors.

E. Within the warranty period, and upon notification of the Contractor by the District, the Contractor shall promptly make needed adjustments, repairs or replacements arising out of defects which, in the judgment of the District, become necessary during such period. The cost of materials, parts, labor, transportation, supervision, special tools, and supplies required for correction of abnormalities shall be paid by the Contractor.
SECTION 13100
CLARIFIER DRIVE REPLACEMENT

F. Final Acceptance: The pre-purchased clarifier drive and motor assemblies shall receive a single final written acceptance from the District once both clarifiers have passed an 8-hour continuous operational test to mark the start of the warranty and last year of the performance bond period.

PART 2 - PRODUCTS

2.1. DISTRICT PRE-PURCHASED EQUIPMENT

A. Contractor shall install two (2) District pre-purchased clarifier drives and motors as provided by the District’s System Supplier.

2.2. ELECTRICAL SYSTEM

A. The Contractor shall retain the services of an Electrical Subcontractor licensed in the State of California who will perform all electrical work associated with removing the existing clarifier drives and motors and installing the pre-purchased drives and motors. See Paragraph 1.8.B for the Contractor’s option to also serve as the Electrical Subcontractor. All electrical work shall be performed in accordance with National Electric Code (NEC). Main tasks shall include, but not necessarily limited to the following:

1. Taking digital images to document the configuration of electrical terminations prior to removal of each of the existing clarifier drives.

2. De-terminating, pulling back, and labeling of existing conductors from each clarifier drive and each bridge mounted junction box.

3. Inspecting exposed sections of conductors for any signs of physical damage.

4. Temporarily taping off and sealing any openings in junction boxes or open conduits to prevent intrusion of moisture during the execution of the Work.

5. Replace all PVC jacked flex conduit with new sections of PVC jacketed flex conduit and appurtenances like-in-kind to re-connect conduits, junction boxes and motors for each clarifier drive installation regardless of which Bid Schedule is executed as part of the contract.

6. Performing non-destructive insulation resistance tests of existing conductors that are disconnected as part of the de-commissioning and removal activities. Testing shall be done in accordance with ANSI/NETA testing standards and recording insulation resistance values and dielectric absorption test results and shall be performed prior to disconnection and after re-connection. All conductors shall be tested under dry weather conditions. Relative humidity at the time of testing shall be recorded on each test data sheet.

7. Submitting test results to the District prior to disconnection and identifying any conductors which show sub-standard insulation resistance. Any sub-standard conductors approved to be removed by the District shall be removed and replaced by the Electrical Subcontractor on a time-and-materials basis.
8. Removing and replacing with like-in-kind any sub-standard conductors.

9. Pulling back and re-terminating power and signal conductors to the pre-purchased clarifier drive once it is installed.

10. If Schedule B is executed as part of the contract, replace all conduit from the bridge connection to the clarifier assembly with in-kind material or better.

B. Contractor shall replace in-kind any electrical system components that are damaged during the Work including, but not limited to, 316 stainless steel junction boxes and wiring, existing rigid conduit, PVC jacketed flex conduit, wiring, grounding cables and hardware and miscellaneous electrical fittings, at no cost to the District. Splices will not be allowed for wiring. If necessary to be replaced, new wiring must be pulled to the electrical room located approximately 400-feet from the clarifiers.

C. MISCELLANEOUS HARDWARE (NOT USED)

D. ANCHOR BOLTS

1. In accordance with Paragraph 1.4.A.10 of this Section, if inspection of the anchors after removal of the clarifier bridge and drive indicates substantial deterioration of existing anchors, Contractor shall furnish all labor to furnish and install new AISI 316 SS anchor bolts for the clarifier bridges and/or drives as specified in Part 3.9 of this Section.

PART 3 - EXECUTION

3.1. DISTRICT’S RESPONSIBILITIES

A. The District will be responsible for the following tasks associated with the Work.

1. Establish the order in which the clarifier drives, and motors will be replaced.

2. Drain the clarifiers.

3. Perform a "hose" wash-down of the clarifiers and the general area around the clarifiers using plant process water prior to mobilization by the Contractor.

4. Provide bypass pumping around the clarifiers during the Contractors work.

5. Lock out and tag out clarifier motors. The Contractor shall be responsible for confirming motors to be disconnected and removed by the Contractor are locked-out prior to start of any work associated with the removal of each clarifier drive.

6. Provide written notification to the Contractor of readiness for a clarifier walkway, drive, motor and appurtenances for removal.

3.2. Pre-Construction Meeting

A. The District will schedule and coordinate a project pre-construction meeting within five (5) working days after issuance of a Notice to Proceed to the Contractor.
1. The pre-construction meeting and all subsequent progress meetings will be held at the WRF Operations Building.

2. Contractor shall submit his construction schedule a minimum of five (5) working days prior to the Pre-Construction Meeting. At the pre-construction meeting, the Contractor shall present his construction schedule. The construction schedule shall be in sufficient detail to control the Work and identify all mobilization, field work, submittal, testing, demobilization and closeout activities as specified in the Contract Documents and as necessary to conduct the Work. The schedule can be presented in a Gantt chart or tabular format with an itemized Work breakdown.

3.3. SCHEDULED PROGRESS MEETINGS

A. The Contractor shall schedule and coordinate progress meetings with the District at the progress milestones specified below.

1. Construction Progress Meeting No. 1 shall be immediately prior to start of removals work on the first clarifier to be improved with a new pre-purchased drive.

2. Construction Progress Meeting No. 2 shall be held following completion of the installation of the first pre-purchased clarifier drive and prior to testing, and immediately prior to start of removals work on the second clarifier to be improved with new a pre-purchased drive.

3. Construction Progress Meeting No. 3 shall be held following completion of the installation of the second pre-purchased clarifier drive and prior to testing.

4. Construction Progress Meeting No. 4 shall be held after both pre-purchased clarifier drives have been placed into service. The meeting will include a Project walkthrough and identification of any final punch list items to be completed by the Contractor prior to Project Closeout.

5. The Contractor shall prepare agendas for each progress meeting and shall prepare meeting summaries for each progress meeting. Agendas shall be prepared and submitted by the Contractor to the District at least 2 calendar days prior to each meeting. Meeting summaries shall be prepared and submitted by the Contractor to the District within 2 calendar days after each meeting.

3.4. TIME FOR COMPLETION AND SCHEDULE MILESTONES

A. The time for completion of the Work, shall be as specified in Section 00810.

3.5. CRANE OPERATIONS AND LIFTING PLANS

A. During submittal preparation, the Contractor shall develop a lifting plan that clearly identifies the locations where the proposed mobile cranes will operate to remove the clarifier walkways and clarifier drives. The locations of mobile cranes shall not interfere with plant operations, nor shall they impose undue surcharge loads on buried plant piping. The District shall review the lifting plan to confirm that the Plan allows for maintenance of plant operations. Lifting plans shall include, but not be limited to the following:
1. Crane specifications and dimensional data on mobile cranes being provided including total width with extended stabilizers, length, boom length and turning radius.

2. Site plans identifying the crane locations for the removal and replacement of each of clarifier walkways and drives.

3. Appurtenances required to avoid undue loads and stresses on walkways during lifting.

4. Provisions to mitigate surcharge loads on subsurface yard piping.

5. Estimated Weights of each lift proposed by the Contractor.

6. Certifications of crane operators.

7. Load tables for the mobile cranes being furnished.

8. Crane safety inspection certifications.

3.6. PREPARATION FOR FIELD WORK

A. The Contractor shall not initiate any field work until all relevant submittals listed under Part 1.10 have been returned to the Contractor by the District with a review disposition of “APPROVED AS NOTED” or better, or “FOR INFORMATION ONLY”.

B. Conditional Evaluation Prior To Removal: Prior to start of removal by the Contractor, the District and Contractor shall jointly inspect the selected clarifier equipment, walkways and ancillary systems to document the condition of the installation. The Contractor shall take digital images of the existing equipment, and ancillary facilities and submit the images to the District.

C. Readiness for Removal: The District will provide the Contractor with a written Notice of Readiness for Removal for the designated clarifier walkway and drive. The District’s written notification will mark the start of the Contractor’s responsibility for the work specified herein for removal and re-installation of each clarifier drive.

D. Once the District has issued the Notice of Readiness and concurs with the conditions documented on the digital images, the Contractor shall have full responsibility for the welfare of existing clarifier drive, walkways and ancillary systems until such time that the pre-purchased drives and motors are installed, tested and ready to be placed into service.

E. Any action by the Contractor or subcontractor, supplier, agent or representative of the Contractor resulting in irreversible damage to the clarifier equipment, walkways and/or ancillary systems shall result in the Contractor furnishing and installing new replacement components or repairing such components to the full satisfaction of the District at no cost to the District.

3.7. EQUIPMENT AND WALKWAY REMOVAL
A. Disconnection Points – Mechanical: All mechanical and pipe line connections shall be disconnected by Contractor. Exposed ends of piping that remain in place shall be temporarily capped by Contractor. All hydraulic oil shall be drained from the existing clarifier drives and shall be captured and disposed of legally by the Contractor prior to removal of the drives.

B. Disconnection Points – Electrical: The Contractor shall take digital images of the field configuration of all existing conductor terminations prior to commencing work. The Contractor shall label and disconnect motor leads to drive motors, and all related junction boxes. Conductors shall be pulled back from the motors and junction boxes to facilitate removal of the clarifier walkways and drives. Conductors shall be labeled, de-terminated, and pulled back to allow any disassembly. Any exposed conductors shall be temporarily taped at the ends and sealed off. Any exposed conduit ends shall be wrapped in polyethylene sheet and taped off to protect them from moisture, dirt, and washdown activities.

3.8. SHIPPING OF EXISTING CLARIFIER DRIVES AND MOTORS

A. As-shipped Photo Record: The Contractor shall take and submit a minimum of ten (10) digital images of each clarifier drive and motor assembly after removal.

B. Contractor shall prepare each drive for shipping to the District’s System Supplier identified herein. Shipping address along with name and phone number for the contact person at the location of the District’s System Supplier’s facility shall be confirmed by the Contractor.

Rebuild-it Services Group, LLC
P.O. Box 651206
Salt Lake City, UT 84165
Attn: Mr. John Lull
Mobile: 949-606-6591
Office: 888-709-5676
Email: jlull@rebuild-it.com

C. The District’s System Supplier shall provide Contractor with the core charge associated with the existing clarifier drive and motor assemblies. Contractor shall obtain insurance on the drive and motor assemblies during shipping in the amount agreed upon by the District’s System Supplier for loss or damage to the drive and motor assemblies during transit to the District’s System Supplier’s facility.

D. Any damage to the clarifier drive and motor assemblies that may occur in route shall be the responsibility of the Contractor. No expense shall be borne by the District for losses incurred during shipping of the clarifier drive and motor assemblies from the Project site to the District’s System Supplier.

3.9. ANCHORING SYSTEMS
A. To the extent possible, the Contractor shall preserve the existing anchor bolts and remove the nuts from the bolts. Any anchor bolts from which the nuts which cannot be readily removed shall be cut. If the District, at its sole discretion, decides that the anchoring system is sufficiently deteriorated and in need of replacement, the District shall instruct the ENGINEER to prepare replacement documents for the affected anchoring points. The time required for preparation of the anchoring design by the ENGINEER shall be added to the schedule and milestone durations identified in this Section. All work associated with repair and/or replacement of existing anchoring systems shall be done by the Contractor on a time and materials basis.

3.10. INSTALLATION, COMMISSIONING AND FIELD ADJUSTMENT

A. The Contractor shall furnish all labor, equipment and materials to assemble, re-install, checkout and test the pre-purchased clarifier drive and motor assemblies in accordance with the approved Testing Plan identified in Paragraph 1.10.B.11 of this Section. The Contractor shall make all process connections and re-terminate all conductors at the junction boxes and drive motors to match the original wiring configuration that existed prior to disassembly by the Contractor.

B. Any damaged sections of flexible conduit and conduit fittings shall be replaced as part of the process of re-terminating conductors. Flexible conduit and fittings shall be as specified in Part 2.2 of this Section.

C. After terminations and connections are reassembled, the Contractor shall notify the District to re-energize the clarifier drive. The Contractor shall perform all activities and tests to confirm that the clarifier mechanism is operating correctly, that all safety interlocks perform as intended, and that the drive is functioning as intended.

D. After the Contractor has completed installation, checkout and initial testing, the Contractor shall send the District a written Notice of Readiness to Test indicating that the same tests will be repeated in the presence of the District. The District shall conduct the tests outlined in the Testing Plan to sign off on the testing of the clarifier mechanism.

E. The Contractor and District shall monitor clarifier operation for a minimum of one 8-hour shift to confirm correct operation of the pre-purchased clarifier drive and motor assemblies and make any adjustments necessary to optimize the performance.

END OF SECTION
PART 1  GENERAL

1.1.  SUMMARY

A.  Section includes:
1.  General requirements applicable to all Electrical Work.
2.  General requirements for electrical submittals.

B.  Interfaces to equipment, instruments, and other components:
1.  Provide all material and labor needed to install the actual equipment furnished, and include all costs to add any additional conduit, wiring, terminals, or other electrical hardware to the Work, which may be necessary to make a complete, functional installation based on the actual equipment furnished:
   a.  Make all changes necessary to meet the manufacturer's wiring requirements.
2.  Submit all such changes and additions to the Engineer for acceptance as specified in Standard Specification 01300 Record Drawings and Submittals.
3.  Review the complete set of Drawings and Specifications in order to ensure that all items related to the electrical power and control systems are completely accounted for. Examine and review field conditions. Include any such items that appear on the Drawings or in the Specifications or in the field from another discipline in the scope of Work:
   a.  If a conflict between Drawings and Specifications and the field is discovered, refer conflict to the Engineer as soon as possible for resolution.
4.  Loop drawings:
   a.  Provide all electrical information required in the preparation of loop drawings including, but not limited to:
      1)  Conduit numbers and associated signal(s) contained within each conduit.
      2)  Wire numbers.
      3)  Equipment terminal numbers.
      4)  Junction boxes and signal(s) contained within each junction box.
      5)  Equipment power sources, and associated circuit numbers.
      6)  As-built drawings detailing wiring.

C.  All electrical equipment and systems for the entire Project must comply with the requirements of the Electrical Specifications, whether referenced in the individual Equipment Specifications or not:
1.  The requirements of the Electrical Specifications apply to all Electrical Work specified in other sections.
2.  Inform all vendors supplying electrical equipment or systems of the requirements of the Electrical Specifications.
3.  District is not responsible for any additional costs due to the failure of Contractor to notify all subcontractors and suppliers of the Electrical Specifications requirements.
D. Contract Documents:
   1. General:
      a. The Drawings and Specifications are complementary and are to be used together in order to fully describe the Work.
   2. Specifications:
      b. These requirements are in addition to all General Requirements.
   3. Drawings:
      a. The Drawings show desired locations, arrangements, and components of the Electrical Work matching the existing layout shown in the field.
      b. Locations of equipment, control devices, instruments, boxes, panels, etc. are approximate only; exercise professional judgment in executing the Work to ensure the best possible installation:
         1) The equipment locations and dimensions are approximate. Use existing field conditions to determine the proper layout, foundation, and pad requirements, etc. for final installation. Coordinate with all subcontractors to ensure that all electrical equipment is compatible with other equipment and space requirements. Make changes required to accommodate differences in equipment dimensions.
         2) The Contractor has the freedom to select any of the named manufacturers identified in the individual specification sections; however, the Engineer has designed the spatial equipment layout based upon a single manufacturer and has not confirmed that every named manufacturer's equipment fits in the allotted space. It is the Contractor's responsibility to ensure that the equipment being furnished fits within the defined space.
      c. Installation details:
         1) Develop installation details that may be necessary for completing the Work, and submit these details for review by the Engineer.

1.2 REFERENCES

A. Code compliance:
   1. The publications are referred to in the text by the basic designation only. The latest edition accepted by the Authority Having Jurisdiction of referenced publications in effect at the time of the bid governs.
   2. The standards listed are hereby incorporated into this Section.
      b. American Society of Civil Engineers (ASCE):
      c. ASTM International (ASTM).
      d. Illuminating Engineering Society (IES).
      e. Institute of Electrical and Electronics Engineers (IEEE).
      f. Insulated Cable Engineers Association (ICEA).
      g. International Code Council (ICC):
            a) AC 156 - Acceptance Criteria for Seismic Certification by Shake Table Testing of Non-Structural Components (ICC-ES AC 156).
      h. International Society of Automation (ISA).
      i. National Electrical Manufacturers Association (NEMA):
1) 250 - Enclosures for Electrical Equipment (1000 V Maximum).

j. National Fire Protection Association (NFPA):
   1) 70 - National Electrical Code (NEC).

k. National Institute of Standards and Technology (NIST).

l. Underwriters' Laboratories, Inc. (UL).

1.3 DEFINITIONS

A. Definitions of terms and other electrical and instrumentation considerations as set forth by:
   1. IEEE.
   2. NETA.
   3. IES.
   4. ISA.
   5. NEC.
   6. NEMA.
   7. NFPA.
   8. NIST.

B. Specific definitions:
   1. FAT: Factory acceptance test.
   2. ICSC: Instrumentation and controls subcontractor.
   3. LCP: Local control panel: Operator interface panel that may contain an HMI, pilot type control devices, operator interface devices, control relays, etc. and does not contain a PLC or RIO.
   4. PCM: Process control module: An enclosure containing any of the following devices: PLC, RTU, or RIO.
   5. PCIS: Process control and instrumentation system.
   6. RTU: Remote telemetry unit: A controller typically consisting of a PLC, and a means for remote communications. The remote communications devices typically are radios, modems, etc.
   7. Space: That portion of the switchgear, motor control center, panelboard, switchboard or control panel that does not physically contain a device but is capable of accepting a device with no modifications to the equipment, i.e., provide all standoffs, bus, and hardware, as part of the space.
   8. Spare: That portion of the switchgear, motor control center, panelboard, switchboard or control panel that physically contains a device with no load connections to be made.
   9. System supplier: Refer to Quality Assurance in this Section.
   10. VCP: Vendor control panel: Control panels that are furnished with particular equipment by a vendor other than the ICSC. These panels may contain PLCs, RIO, OIT, HMI, etc.
   11. Unequipped space: That portion of the switchgear, motor control center, panelboard, switchboard or control panel that does not physically contain a device, standoff, bus, hardware, or other equipment.

1.4 SYSTEM DESCRIPTION

A. General requirements:
   1. The Work includes everything necessary for and incidental to executing and completing the Electrical Work indicated on the Drawings, specified in the Specifications, and indicated in the field and reasonably inferable there from:
2. It is the intent of these Specifications that the entire electrical power, instrumentation, and control system be complete and operable. Provide all necessary material and labor for the complete system from source of power to final utilization equipment, including all connections, testing, calibration of equipment furnished by others as well as equipment furnished by the Contractor, whether or not specifically mentioned but which are necessary for successful operation.

3. Provide all Electrical Work, including conduit, field wiring, and connections by the electrical subcontractor under the provisions of the Electrical Specifications for all aspects of the Work.

4. Coordinate all aspects of the Work with the electrical subcontractor and other subcontractors before bidding in order to ensure that all costs associated with a complete installation are included. The District is not responsible for any change orders due to lack of coordination of the Work between the Contractor, the electrical subcontractor, the other subcontractors or suppliers.

5. Demolition:
   a. Where demolition is specified or indicated on the Drawings, disconnect all associated electrical equipment and render the equipment safe.
   b. Remove and dispose of all conduit, wire, electrical equipment, controls, etc. associated with the items and/or areas to be demolished as indicated on the Drawings unless otherwise indicated.
   c. For each piece of equipment to be removed, remove all ancillary components (e.g. instruments, solenoid valves, disconnect switches, etc.).
   d. Conduit:
      1) Where conduit removal, other than associated with equipment to be removed, is indicated on the Drawings:
         a) Remove exposed conduit to the point of encasement or burial.
         b) Cut conduit flush and plug or cap encased or buried conduit.
      2) Where conduits are to remain in place and removal is not indicated on the Drawings:
         a) Cap conduit open ends.
         b) Re-label empty conduits as spare.
   e. Remove all wire back to the source for all conduits to be removed or abandoned in place.
   f. Provide new nameplates for modified electrical distribution equipment, motor control centers etc. to identify equipment and circuits that are no longer used as spares.
   g. Provide new typewritten schedules for all modified panelboards.

6. Portions of this Project involve installation in existing facilities and interfaces to existing circuits, power systems, controls, and equipment:
   a. Perform and document comprehensive and detailed field investigations of existing conditions (circuits, power systems, controls, equipment, etc.) before starting any Work. Determine all information necessary to document, interface with, modify, upgrade, or replace existing circuits, power systems, controls, and equipment.
   b. Provide and document interface with, modifications to, upgrades, or replacement of existing circuits, power systems, controls, and equipment.

7. Provide all trenching, forming, rebar, concrete, back filling, hard surface removal and replacement, for all items associated with the Electrical Work and installation if required.
B. Operating facility:
1. The Olivenhain Municipal Water District 4S Ranch Water Reclamation Facility is an operating facility. Portions of this facility must remain fully functional throughout the entire construction period. In consideration of this requirement, comply with the following guidelines:
   a. All outages must be of minimal duration and fully coordinated and agreed to by the District. Adjust the construction schedule to meet the requirements of the District. All changes in schedule and any needs to reschedule are included in the Work.
   b. As weather and water demand conditions dictate, re-adjust the construction schedule to meet the demands placed upon District by its users.
   c. Coordinate the construction and power renovation, bear all costs, so that all existing facilities can continue operation throughout construction.
2. According to individual circumstances and in compliance with the Drawings, extend or replace conduit and cable connections from existing locations.
3. The standards of documentation, instrument tagging, cable and conductor ferruling, terminal identification and labeling that apply to the new installation apply equally to the existing installation which forms part of the modified system.

1.5 SUBMITTALS

A. Furnish submittals as specified in Standard Specifications Section 01300 Record Drawings and Submittals and this Section.

B. General:
1. Instruct all equipment suppliers of submittals and operation and maintenance manuals of the requirements in this Section.
2. Furnish the submittals required by each section in the Electrical Specifications.
3. Adhere to the standard industry wiring numbering scheme:
   a. Uniquely number each wire.
4. Use equipment and instrument tags, for all submittals.

C. Seismic requirements:
1. Provide electrical equipment with construction and anchorage to supporting structures designed to resist site seismic loads based on the seismic design criteria.

D. Submittal organization:
1. First page:
   b. Name and telephone number of individual who reviewed submittal before delivery to Engineer.
   c. Name and telephone number of individual who is primarily responsible for the development of the submittal.
   d. Place for Contractor's review stamp and comments.
2. Next pages:
   a. Provide confirmation of specification compliance:
      1) Specification section: Include with each submittal a copy of the relevant specification section.
a) Indicate in the left margin, next to each pertinent paragraph, either compliance with a check (√) or deviation with a consecutive number (1, 2, 3).

b) Provide a list of all numbered deviations with a clear explanation and reason for the deviation.

b. Include a response in writing to each of the Engineer's comments or questions for submittal packages which are re-submitted:
   1) In the order that the comments or questions were presented throughout the submittal.
   2) Referenced by index section and page number on which the comment appeared.
   3) Acceptable responses to Engineer's comments are either:
      a) Engineer's comment or change is accepted and appropriate changes are made.
      b) Explain why comment is not accepted or requested change is not made.
      c) Explain how requirement will be satisfied in lieu of comment or change requested by Engineer.
   4) Any re-submittal, which does not contain responses to the Engineer's previous comments shall be returned for Revision and Re-submittal.
   5) No further review by the Engineer will be performed until a response for previous comments has been received.

3. Remaining pages:
   a. Actual submittal data:
      1) Organize submittals in exactly the same order as the items are referenced, listed, and/or organized in the specification section.
      2) For submittals that cover multiple devices used in different areas under the same specification section, the submittal for the individual devices must list the area where the device is intended to be used.

E. Submittal requirements:
   1. Furnish submittals that are fully indexed with a tabbed divider for every component.
   2. Sequentially number pages within the tabbed sections. Submittals and operation and maintenance manuals that are not fully indexed and tabbed with sequentially numbered pages, or are otherwise unacceptable, will be returned without review.
   3. Edit all submittals and operation and maintenance manuals so that the submittal specifically applies to only the equipment furnished.
      a. Neatly cross out all extraneous text, options, models, etc. that do not apply to the equipment being furnished, so that the information remaining is only applicable to the equipment being furnished.
   4. Submit copies of shop drawings, and product data:
      a. Show dimensions, construction details, wiring diagrams, controls, manufacturers, catalog numbers, and all other pertinent details.
   5. Where submittals are required, provide a separate submittal for each specification section. In order to expedite construction, the Contractor may make more than 1 submittal per specification section, but a single submittal may not cover more than 1 specification section:
      a. The only exception to this requirement is when 1 specification section covers the requirements for a component of equipment specified in another section. (For example, circuit breakers are a component of
switchgear. The switchgear submittal must also contain data for the associated circuit breakers, even though they are covered in a different specification section.)

6. Exceptions to Specifications and Drawings:
   a. Include a list of proposed exceptions to the Specifications and Drawings along with a detailed explanation of each.
   b. If there is insufficient explanation for the exception or deviation, the submittal will be returned requiring revision and re-submittal.
   c. Acceptance of any exception is at the sole discretion of the Engineer.
      1) Provide all items (materials, features, functions, performance, etc.) required by the Contract Documents that are not accepted as exceptions.
   d. Replace all items that do not meet the requirements of the Contract Documents, which were not previously accepted as exceptions, even if the submittals contained information indicating the failure to meet the requirements.
   e. Product data:
      1) Submitted for non-custom manufactured material listed in this and other sections and shown on shop drawings.
      2) Include:
         a) Catalog cuts.
         b) Bulletins.
         c) Brochures.
         d) Quality photocopies of applicable pages from these documents.
         e) Identify on the data sheets the Project name, applicable specification section, and paragraph.
         f) Identify model number and options for the actual equipment being furnished.
         g) Neatly cross out options that do not apply or equipment not intended to be supplied.
      f. Detailed sequence of operation for all equipment or systems.

F. Record Documents:
   1. Furnish as specified in Standard Specifications Section 01300 Record Drawings and Submittals.
   2. Record Drawing requirements:
      a. Submit Record Drawings upon completion of the Work for final review.
      b. Clearly and neatly show all changes including the following:
         1) All existing pipe, conduit, wire, instruments or other structures encountered or uncovered during construction.
   3. Review and corrections:
      a. Correct any record documents or other documents found to be incomplete, not accurate, of poor quality, or containing errors.
      b. Promptly correct and re-submit record documents returned for correction.

G. Test reports:
   1. As specified in Standard Specifications Section 01300 Record Drawings and Submittals.
   2. Include the following:
      a. A description of the test.
      b. List of equipment used.
      c. Name of the person conducting the test.
d. Date and time the test was conducted.
e. All raw data collected.
f. Calculated results.
g. Each report signed by the person responsible for the test.
3. Additional requirements for field acceptance test reports are specified in 13100 – Clarifier Drive Replacement.

H. Calculations:
1. Where required by specific Electrical Specifications:
   a. Because these calculations are being provided by a registered professional engineer, they will be reviewed for form, format, and content but will not be reviewed for accuracy and calculation means.

1.6 QUALITY ASSURANCE

A. Furnish all equipment listed by and bearing the label of UL or of an independent testing laboratory acceptable to the Engineer and the Authority Having Jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Shipping precautions:
   1. After completion of shop assembly and successful factory testing, pack all equipment in protective crates, and enclose in heavy duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture.
   2. Place dehumidifiers, when required, inside the polyethylene coverings.
   3. Skid-mount the equipment for final transport.
   4. Provide lifting rings for moving without removing protective covering.
   5. Display boxed weight on shipping tags together with instructions for unloading, transporting, storing, and handling at the job site.

B. Delivery and inspection:
   1. Deliver products in undamaged condition, in manufacturer's original container or packaging with identifying labels intact and legible. Include date of manufacture on label.

C. Special instructions:
   1. Securely attach special instructions for proper field handling, storage, and installation to each piece of equipment before packaging and shipment.

1.8 PROJECT OR SITE CONDITIONS

A. Site conditions:
   1. Provide an electrical and control system, including all equipment, raceways, and any other components required for a complete installation that meets the environmental conditions for the Site as specified in the General Requirements and below.
   2. Altitude, temperature and humidity:
      a. Provide all electrical components and equipment fully rated for continuous operation at this altitude, with no additional derating factors applied.
      b. Provide additional temperature conditioning equipment to maintain all equipment in non-conditioned spaces subject to these ambient temperatures, with a band of 10 degrees Fahrenheit above the minimum
operating temperature and 10 degrees Fahrenheit below maximum operating temperature, as determined by the equipment manufacturer's guidelines:

1) Provide all power conduits wiring for these devices (e.g. heaters, fans, etc.) whether indicated on the Drawings or not.

3. Site security:
   a. Abide by all security and safety rules concerning the Work on the Site.

4. Outdoor installations:
   a. Provide electrical and control equipment suitable for operation in the ambient conditions where the equipment is located.

B. Provide enclosures for electrical and control equipment, regardless of supplier or subcontractor furnishing the equipment, that meet the requirements outlined in NEMA Standard 250 for the following types of enclosures:

1. NEMA Type 1: Intended for indoor use, primarily to provide a degree of protection from accidental contact with energized parts or equipment.
2. NEMA Type 4: Intended for indoor or outdoor use, primarily to protect equipment from exposure to windblown dust and rain, splashing or hose directed water, ice formation and freezing.
3. NEMA Type 4X: Made from corrosion resistant materials and are intended for indoor or outdoor use, primarily to protect equipment from exposure to windblown dust and rain, splashing or hose directed water, ice formation and freezing, and corrosion.
4. NEMA Type 12: Intended for indoor use, primarily to provide a degree of protection from dust, falling dirt and dripping non-corrosive liquids.
5. NEMA Type 6: Rated for submergence.
6. NEMA Type 6P: Rated for prolonged submergence.
7. Modify exposed conduit runs as specified in Section 16130 - Conduits.

1.9 WARRANTY

A. Warrant the Electrical Work as specified elsewhere in the Contract Documents.

1.10 SYSTEM START-UP

A. Replace or modify equipment and materials that do not achieve design requirements after installation in order to attain compliance with the design requirements:

1. Following replacement or modification, retest the system and perform additional testing to place the complete system in satisfactory operation and obtain compliance acceptance from the Engineer.

1.11 MAINTENANCE

A. Before Substantial Completion, perform all maintenance activities required by any sections of the Specifications including any calibrations, final adjustments, component replacements or other routine service required before placing equipment or systems in service.
PART 2 PRODUCTS

2.1 MANUFACTURERS
A. Provide similar items of same manufacturer throughout the electrical and instrumentation portion of the Project.
B. Allowable manufacturers are specified in individual Electrical Specifications.

2.2 MATERIALS
A. Furnish all materials under this Contract that are new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these products and that bear all approvals and labels as required by the Specifications.
   1. Provide materials complying with the applicable industrial standard.
B. Stainless steel:
   1. Where stainless steel is indicated or used for any portion of the Electrical Work, provide a non-magnetic, corrosion-resistant alloy, ANSI Type 316, satin finish.
   2. Provide exposed screws of the same alloys.
   3. Provide finished material free of any burrs or sharp edges.
   4. Use only stainless steel hardware, when chemically compatible, in all areas that are or could be in contact with corrosive chemicals.
   5. Use stainless steel hardware, when chemically compatible, in all chemical areas or areas requiring NEMA Type 4X construction.
   6. Do not use stainless steel in any area containing chlorine, gas or solution, chlorine products or ferric chloride.

2.3 SOURCE QUALITY CONTROL
A. Provide all equipment that is new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these products.

PART 3 EXECUTION

3.1 EXAMINATION
A. An optional Pre-Bid site visit has been scheduled for at the 4S Water Reclamation Facility (16595 Dove Canyon Rd. San Diego, CA 92127). It is highly encouraged for contractors and subcontractors to visit the site prior to bidding however, a site visit is not mandatory in order to submit a bid.
B. Review the site conditions and examine all drawings for the various items of equipment in order to determine exact routing and final terminations for all wiring and cables.

3.2 INSTALLATION
A. Equipment locations shown on Drawings may change due to variations in equipment size or minor changes made by others during construction:
1. Verify all dimensions:
   a. Actual field conditions govern all final installed locations, distances, and levels.

2. Review all Contract Documents and approved equipment shop drawings and coordinate Work as necessary to adjust to all conditions that arise due to such changes.

3. Make minor changes in location of equipment before rough in, as directed by the District.

4. Provide a complete electrical system:
   a. Install all extra conduits, cables, and interfaces as may be necessary to provide a complete and operating electrical system.

B. Install the equipment in accordance with the accepted installation instructions and anchorage details to meet the seismic and wind load requirements at the Project site.

C. Cutting and patching:
   1. Perform all cutting, patching, channeling, core drilling, and fitting required for the Electrical Work, except as otherwise directed:
      a. Secure the permission of the Engineer before performing any operation likely to affect the strength of a structural member such as drilling, cutting or piercing:
         1) Before cutting, channeling, or core drilling any surface, ensure that no penetration of any other systems will be made:
            a) Verify that area is clear and free of conduits, cables, piping, ductwork, post-tensioning cables, etc.
            b) Use tone-locate system or X-ray to ensure that area is clear of obstructions.
      b. Review existing conditions and as-built drawings to ensure that there are no conflicts or coordination problems before cutting, channeling, or core drilling any surface.

   2. Perform all patching to the same quality and appearance as the original work. Employ the proper tradesmen to secure the desired results. Seal around all conduits, wires, and cables penetrating walls, ceilings, and floors in all locations with a fire stop material, typically:
      a. 3M: CP 25WB+: Caulk.
      b. 3M: Fire Barrier: Putty.

D. Install all conduits and equipment in such a manner as to avoid all obstructions and to preserve headroom and keep openings and passageways clear:
   1. Install all conduits and equipment in accordance with working space requirements in accordance with the NEC.
      a. This includes any panel, disconnect switch or other equipment that can be energized while open exposing live parts regardless of whether it is likely to require examination or has serviceable parts.
   2. Where the Drawings do not show dimensions for locating equipment, install equipment in the approximate locations indicated on the Drawings.
      a. Adjust equipment locations as necessary to avoid any obstruction or interferences.
   3. Where an obstruction interferes with equipment operation or safe access, relocate the equipment.
4. Where the Drawings do not indicate the exact mounting and/or supporting method to be used, use materials and methods similar to existing conditions.

E. Earthwork and concrete:
1. Install all trenching, shoring, concrete, backfilling, grading and resurfacing associated with the Electrical Work as necessary.

F. Terminations:
1. Provide and terminate all conductors required to interconnect power, controls, instruments, panels, and all other equipment.

G. Miscellaneous installation requirements:
1. In case of interference between electrical equipment indicated on the Drawings and the other equipment, notify the Engineer.
2. Location of manholes and pullboxes are approximate. Coordinate exact location of manholes and pullboxes.
3. Provide additional manholes or pullboxes to those shown where they are required to make a workable installation.
4. Circuits of different service voltage:
   a. Voltage and service levels:
      1) Medium voltage: greater than 1.0 kV.
      2) Low voltage: 120 V to 480 V.
      3) Instrumentation: Less than 50 VDC.
   b. Install different service voltage circuits in separate raceways and junction boxes, separate in manholes, hand holes, and pullboxes as necessary.
   c. In manholes, install all cables operating at less than 50 VDC in PVC coated flexible metallic conduit, with corrosion resistant fittings.

H. Labeling:
1. Provide all nameplates and labels as specified by NFPA 70E.

I. Equipment tie-downs:
1. Anchor all instruments, control panels, and equipment by methods that comply with seismic and wind bracing criteria, which apply to the Site.
2. All control panels, VCPs, LCPs, RTUs, PCMs, etc., must be permanently mounted and tied down to structures in accordance with the Project seismic criteria.

3.3 COMMISSIONING

A. As specified in Section 13100 – Clarifier Drive Replacement.

3.4 FIELD QUALITY CONTROL

A. Inspection:
1. Allow for inspection of electrical system installation.
2. Provide any assistance necessary to support inspection activities.
3. Engineer inspections may include, but are not limited to, the following:
   a. Inspect equipment and materials for physical damage.
   b. Inspect installation for compliance with the Drawings and Specifications.
   c. Inspect installation for obstructions and adequate clearances around equipment.
d. Inspect equipment installation for proper leveling, alignment, anchorage, and assembly.

e. Inspect equipment nameplate data to verify compliance with design requirements.

f. Inspect raceway installation for quality workmanship and adequate support.

g. Inspect cable terminations.

h. Schedule structural engineer to inspect all mounting of electrical devices and all penetration and connections to structures if required.

B. Field acceptance testing (Functional Testing):

1. Notify the Engineer when the Electrical Work is ready for field acceptance testing.

2. Record results of the required tests along with the date of test:
   a. Use conduit identification numbers to indicate portion of circuit tested.

C. Workmanship:

1. Leave wiring in panels, manholes, boxes, and other locations neat, clean, and organized:
   a. Neatly coil and label spare wiring lengths.
   b. Shorten, re-terminate, and re-label excessive used as well as spare wire and cable lengths, as determined by the Engineer.

3.5 CLEANING

A. Remove all foreign material and restore all damaged finishes to the satisfaction of the Engineer and District.

B. Clean and vacuum all enclosures to remove all metal filings, surplus insulation and any visible dirt, dust or other matter before energization of the equipment or system start-up:
   1. Use of compressors or air blowers for cleaning is not acceptable.

C. For all new and re-used existing conduits: Make all bends using an approved bending tool. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated. Cut all conduits square and ream all cuts to remove burrs. Exercise all necessary precautions during the construction period to prevent entry or accumulation of moisture, dust, concrete, and all foreign matter into the raceway system. The contractor shall pull a wire brush, ball of rags, and a mandrel through each raceway to ensure the raceway interior is clean and dry prior to pulling conductors or cable. All underground conduits and ducts 1-1/2 inches and larger shall be proven clear by pulling through a ball mandrel (diameter approximately 85 percent of conduit inside diameter) followed by close fitting wire brush and wad of felt or similar material. Clear raceway of all obstructions and dirt prior to pulling in wires or cables. Clean empty raceways similarly. Clear or replace any raceway which rejects ball mandrel.

D. As specified in other sections of the Contract Documents.

3.6 PROTECTION

A. Protect all Work from damage or degradation until Substantial Completion.
B. Maintain all surfaces to be painted in a clean and smooth condition.

END OF SECTION
SECTION 16130

CONDUITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Metallic conduits.
   2. Nonmetallic conduits.
   3. Conduit bodies.
   4. Conduit fittings and accessories.
   5. Conduit installation.

1.2 REFERENCES

A. As specified in Section 16050 - Common Work Results for Electrical.

B. American National Standards Institute (ANSI):
   1. C80.1 - Electrical Rigid Steel Conduit.
   2. C80.3 - Steel Electrical Metallic Tubing.
   3. C80.5 - Electrical Rigid Aluminum Conduit.
   4. C80.6 - Electrical Intermediate Metal Conduit.

C. National Electrical Manufacturer's Association (NEMA):
   1. RN-1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Steel Conduit.
   2. TC2 - Electrical Polyvinyl Chloride (PVC) Conduit.
   3. TC3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
   4. TC7 - Smooth-Wall Coilable Electrical Polyethylene Conduit.
   5. TC13 - Electrical Nonmetallic Tubing.
   6. TC14 - Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.

D. Underwriters Laboratories (UL):
   1. 1 - Standard for Flexible Metal Conduit.
   2. 6 - Standard for Electrical Rigid Metal Conduit - Steel.
   3. 6A - Standard for Electrical Rigid Metal Conduit - Aluminum, Red Brass, and Stainless Steel.
   4. 360 - Standard for Liquidtight Flexible Steel Conduit.
   5. 651 - Standard for Schedule 40 and 80 Rigid PVC Conduit and Fittings.
   6. 651B - Standard for Continuous Length HDPE Conduit.
   7. 797 - Standard for Electrical Metallic Tubing - Steel.
   8. 1242 - Standard for Electrical Intermediate Metal Conduit - Steel.
   10. 1660 - Standard for Liquidtight Flexible Nonmetallic Conduit.
   11. 1684 - Standard for Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
1.3 DEFINITIONS

A. As specified in Section 16050 - Common Work Results for Electrical.

B. Specific definitions and abbreviations:
   1. Conduit bodies: A separate portion of a conduit system that provides access through a removable cover to the interior of the system at a junction of 2 or more conduit sections. Includes, but not limited to, Shapes C, E, LB, T, X, etc.
   2. Conduit fitting: An accessory that primarily serves a mechanical purpose. Includes, but not limited to, bushings, locknuts, hubs, couplings, reducers, etc.
   3. GRC: Galvanized rigid steel conduit.
   4. PCS: Polyvinyl chloride (PVC) coated rigid steel conduit.
   5. PVC: Polyvinyl chloride rigid nonmetallic conduit.
   6. SLT: Sealight-liquidtight flexible conduit.
   7. NPT: National pipe thread.

1.4 SYSTEM DESCRIPTION

A. Provide conduits, conduit bodies, fittings, junction boxes, and all necessary components, whether or not indicated on the Drawings, as required, to install a complete electrical raceway system to replace the existing system.

1.5 SUBMITTALS

A. Furnish submittals as specified in the Standard Specifications Section 01300 Record Drawings and Submittals and 16050 - Common Work Results for Electrical.

B. Product data:
   1. Furnish complete manufacturer's catalog sheets for every type and size of conduit, fitting, conduit body, and accessories to be used on the Project.
   2. Furnish complete manufacturer's recommended special tools to be used for installation if required.
   3. Certified test results for PVC-coated metallic conduit showing the adhesive bond is stronger than the tensile strength of the PVC.

C. Shop drawings:
   1. Furnish conduit routing plans for all conduits before the installation of any conduit.
   2. Detail the intended routing of each conduit, conduit material and include supporting methods.
   3. Number conduits in accordance with existing layout.
      a. Provide conduit labels.

D. Certifications:
   1. Furnish PVC-coated conduit manufacturer's certification for each installer.

E. Record Documents:
   1. Furnish hard copy drawings of conduit layout if differing from existing layout.

1.6 QUALITY ASSURANCE

A. As specified in Section 16050 - Common Work Results for Electrical.

B. All conduits, conduit bodies, and fittings shall be UL listed and labeled.
C. Every installer of PVC-coated metallic conduit shall be certified by the manufacturer for installation of the conduit.

1.7 DELIVERY, STORAGE, AND HANDLING

A. As specified in Section 16050 - Common Work Results for Electrical.
B. Do not expose non-metallic conduit to direct sunlight.
C. Do not store conduit in direct contact with the ground.

1.8 PROJECT OR SITE CONDITIONS

A. As specified in Section 16050 - Common Work Results for Electrical.

1.9 SEQUENCING

A. Before installing any conduit or locating any device box:
   1. Verify all dimensions and space requirements and make any minor adjustments to the conduit system as required to avoid conflicts with the building structure, other equipment, or the work of other trades.

1.10 WARRANTY

A. As specified in Section 16050 - Common Work Results for Electrical.

1.11 SYSTEM START-UP

A. As specified in Section 16050 - Common Work Results for Electrical.

PART 2 PRODUCTS

2.1. MANUFACTURERS

A. Galvanized rigid steel conduit:
   1. One of the following or equal:
      a. Western Tube and Conduit.
      b. Allied Tube and Conduit.
      c. Wheatland Tube Co.

B. PVC-coated rigid steel conduit:
   1. One of the following or equal:
      a. Robroy Ind.
      b. Ocal, Inc.
      c. Calbond.
      d. O'kote Inc.

C. Sealtight-liquidtight flexible conduit (with UV-resistant PVC jacket):
   1. One of the following or equal:
      a. Southwire.
      b. AFC Cable Systems.
      c. Electri-Flex Co.
      d. Anamet Electrical Inc. Anaconda.
D. Rigid nonmetallic PVC conduit:
   1. One of the following or equal:
      a. Carlon.
      b. Cantex.
      c. Triangle Conduit and Cable.

E. Electrical nonmetallic tubing:
   1. One of the following or equal:
      a. Carlon Flex-Plus Blue.
      b. Specified Technologies, Inc.

F. Inner duct:
   1. One of the following or equal:
      a. Carlon.
      b. Endot Ind.
      c. MaxCell.

G. Conduit bodies (PVC-coated where used with PVC-coated conduit):
   1. One of the following or equal:
      a. Crouse-Hinds.
      b. Appleton.
      c. O-Z/Gedney.
      d. Ocal, Inc.
      e. Robroy Ind.
      f. Calbond.
      g. Carlon.

H. Joint compound:
   1. The following or equal:
      a. Thomas and Betts.

I. Galvanized rigid steel conduit expansion fittings (PVC-coated where used with PVC-coated conduit):
   1. One of the following or equal:
      a. Crouse-Hinds.
      b. Appleton.
      c. O-Z/Gedney.

J. Conduit sleeve (PVC-coated where used with PVC-coated conduit):
   1. One of the following or equal:
      a. Crouse-Hinds.
      b. Appleton.
      c. O-Z/Gedney.

K. Conduit seals (PVC-coated where used with PVC-coated conduit):
   1. One of the following or equal:
      a. Appleton.
      b. Crouse-Hinds.
      c. O-Z/Gedney.

L. Conduit hangers and supports (PVC-coated where used with PVC-coated conduit):
   1. As specified in Section 16070 - Hangers and Supports.
M. Conduit through wall and floor seals:
   1. The following or equal:
      a. O-Z/Gedney:
         1) Type "WSK."
         2) Type "CSM."

2.2 COMPONENTS

A. GRC:
   1. All threads: NPT standard conduit threads with a 3/4-inch taper per foot:
      a. Running conduit threads are not acceptable.
   2. Hot-dip galvanized inside and out:
      a. Ensures complete coverage and heats the zinc and steel to a temperature
         that ensures the zinc alloys with the steel over the entire surface.
      b. Electro-galvanizing is not acceptable.
   3. Manufactured in accordance with:
      a. UL-6.
      b. ANSI C80.1.

B. PCS:
   1. The steel conduit, before PVC coating, shall be new, unused, hot-dip
galvanized material, conforming to the requirements for Type GRC.
   2. Coated conduit NEMA Standard RN-1:
      a. The galvanized coating may not be disturbed or reduced in thickness
during the cleaning and preparatory process.
   3. Factory-bonded PVC jacket:
      a. The exterior galvanized surfaces shall be coated with primer before PVC
         coating to ensure a bond between the zinc substrate and the PVC
         coating.
      b. Nominal thickness of the exterior PVC coating shall be 0.040 inch except
         where part configuration or application of the piece dictates otherwise.
      c. PVC coating on conduits and associated fittings shall have no sags,
         blisters, lumps, or other surface defects and shall be free of holes and
         holidays.
      d. The PVC adhesive bond on conduits and fittings shall be greater than the
tensile strength of the PVC plastic coating:
         1) Confirm bond with certified test results.
   4. A urethane coating shall be uniformly and consistently applied to the interior of
      all conduits and fittings:
      a. Nominal thickness of 0.002 inch.
      b. Conduits having areas with thin or no coating are not acceptable.
      c. All threads shall be coated with urethane.
   5. The PVC exterior and urethane interior coatings applied to the conduits shall
      afford sufficient flexibility to permit field bending without cracking or flaking at
      temperature above 30 degrees Fahrenheit (-1 degree Celsius).
   6. PCS conduit bodies and fittings:
      a. Malleable iron.
      b. The conduit body, before PVC coating, shall be new, unused material and
         shall conform to appropriate UL standards.
      c. The PVC coating on the outside of conduit bodies shall be 0.040-inch
         thick and have a series of longitudinal ribs to protect the coating from tool
damage during installation.
d. 0.002-inch interior urethane coating.
e. Utilize the PVC coating as an integral part of the gasket design.
f. Stainless steel cover screw heads shall be encapsulated with plastic to ensure corrosion protection.
g. A PVC sleeve extending 1 conduit diameter or 2 inches, whichever is less, shall be formed at each female conduit opening.
   1) The inside diameter of the sleeve shall be the same as the outside diameter of the conduit to be used.
   2) The sleeve shall provide a vapor- and moisture-tight seal at every connection.

C. SLT:
1. Temperature rated for use in the ambient temperature at the installed location but not less than the following:
   a. General purpose:
      1) Temperature range: -20 degrees Celsius to +80 degrees Celsius.
   b. Oil-resistant:
      1) Temperature range: -20 degrees Celsius to +60 degrees Celsius.
2. Sunlight-resistant, weatherproof, and watertight.
3. Manufactured from single strip steel, hot-dip galvanized on all 4 sides before conduit fabrication.
4. Strip steel spiral wound resulting in an interior that is smooth and clean for easy wire pulling.
5. Overall PVC jacket.
6. With integral copper ground wire, built in the core, in conduit trade sizes 1/2 inch through 1-1/4 inch.

D. PVC:
1. Extruded from virgin PVC compound:
   a. Schedule 40 unless otherwise specified (in concrete reinforced ductbank).
   b. Schedule 80 extra-heavy wall where specified (direct buried).
2. Rated for 90 degrees Celsius conductors or cable.
3. Rated for use in direct sunlight.

E. Conduit bodies:
1. Material consistent with conduit type:
   a. Malleable iron bodies and covers when used with Type GRC.
   b. PVC bodies and covers when used with Type PVC.
   c. PVC-coated malleable iron bodies and covers when used with Type PCS.
2. Conduit bodies to conform to Form 8, Mark 9, or Mogul design:
   a. Mogul design conforming to NEC requirements for bending space for large conductors for conduit trade sizes of 1 inch and larger with conductors #4 AWG and larger, or where required for wire-bending space.
   b. Gasketed covers attached to bodies with stainless steel screws secured to threaded holes in conduit body.

2.3 ACCESSORIES

A. Connectors and fittings:
1. Manufactured with compatible materials to the corresponding conduit.

B. Insulated throat metallic bushings:
1. Construction:
a. Malleable iron or zinc-plated steel when used with steel conduit.
b. Positive metallic conduit end stop.
c. Integrally molded non-combustible phenolic-insulated surfaces rated at 150 degrees Celsius.
d. Use fully insulated bushings on nonmetallic conduit system made of high-impact 150 degrees Celsius rated non-combustible thermosetting phenolic.

C. Insulated grounding bushings:
   1. Construction:
      a. Malleable iron or steel, zinc-plated, with a positive metallic end stop.
      b. Integrally molded non-combustible phenolic-insulated surfaces rated at 150 degrees Celsius.
      c. Tin-plated copper grounding saddle for use with copper or aluminum conductors.

D. Electrical unions (Erickson Couplings):
   1. Construction:
      a. Malleable iron for use with steel conduit (PVC-coated where used with PVC-coated conduit).
      b. Concrete tight, 3-piece construction.
      c. Rated for Class I Division 1 Group D in hazardous areas.

E. SLT fittings:
   1. Construction:
      a. Malleable iron.
      b. Furnished with locknut and sealing ring.
      c. Liquid-tight, rain-tight, oil-tight.
      d. Insulated throat.
      e. Furnish as straight, 45-degree elbows, and 90-degree elbows.
      f. Designed to prevent sleeving:
         1) Verify complete bonding of the raceway jacket to the plastic gasket seal.
      g. Equipped with grounding device to provide ground continuity irrespective of raceway core construction. Grounding device, if inserted into raceway and directly in contact with conductors, shall have rolled-over edges for sizes under 5 inches. Where terminated into a threadless opening using a threaded hub fitting, a suitable moisture-resistant/oil-resistant synthetic rubber gasket shall be provided between the outside of the box or enclosure and the fitting shoulder. Gasket shall be adequately protected by and permanently bonded to a metallic retainer.
   2. Corrosion-resistant and outdoor SLT fittings:
      a. Construction:
         1) PVC-coated liquid-tight fittings with a bonded 0.040-inch thick PVC coating on the metal connector to form a seal around the SLT conduit.
         2) Insulated throat and an integral sealing ring.

F. Hubs for threaded attachment of steel conduit to sheet metal enclosures:
   1. Construction:
      a. Insulated throat.
      b. PVC-coated when used in corrosive areas.
c. Bonding locknut.
d. Recessed neoprene o-ring to ensure watertight and dust-tight connector.
e. 1/2-inch through 1-1/4-inch steel zinc electroplated.
f. 1-1/2-inch through 6-inch malleable iron zinc plated.

2. Usage:
   a. All conduits in damp, wet, outdoor, and corrosive areas shall use threaded hubs for connections to sheet metal enclosures.

G. Sealing fittings:
   1. Construction:
      a. 40-percent wire fill capacity.
      b. PVC-coated when used in corrosive areas.
      c. Malleable ductile iron with steel conduit.
      d. Crouse-Hinds Type EYD where drains are required.
      e. Crouse-Hinds Type EYS where drains are not required.
      f. UL listed for use in Class I, Division 1, Groups A, B, C, D; Class I, Division 2, Groups A, B, C, D; and Class II, Divisions 1 and 2, Groups E, F, and G.
   2. Sealing compound:
      a. Fiber filler and cement as recommended by the sealing fitting manufacturer.
      b. Approved for the conditions and use.
         1) Not affected by surrounding atmosphere or liquids.
      c. Melting point shall be 200 degrees Fahrenheit minimum.

H. PVC fittings:
   1. Shall include the following:
      a. Couplings.
      b. Terminal adapters.
      c. Female adapters.
      d. Caps.
      e. Reducer bushings.
      f. Duct couplings.
      g. End bells.
      h. Expansion couplings.
      i. Duct couplings: 5 degree.
      j. C-Type pull fittings.
      k. E-Type pull fittings.
      l. LB-Type pull fittings.
      m. LL-Type pull fittings.
      n. LR-Type pull fittings.
      o. T-Type pull fittings.
      p. X-Type pull fittings.
      q. Service entrance caps.
   2. Materials:
      a. All devices shall be made of PVC, using the same materials as used for Type PVC conduit.
      b. All metal hardware shall be stainless steel.

I. Through wall and floor seals:
   1. Materials:
      a. Body: Casting of malleable or ductile iron with a hot-dip galvanized finish.
b. Grommet: Neoprene.
c. Pressure rings: PVC-coated steel.
d. Disc material: PVC-coated steel.

J. Expansion/deflection couplings:
1. Use to compensate for movement in any directions between 2 conduit ends where they connect.
2. Shall allow movement of 3/4 inch from the normal in all directions.
3. Shall allow angular movement for a deflection of 30 degrees from normal in any direction.
4. Constructed to maintain electrical continuity of the conduit system.
5. Materials:
   a. End couplings: Bronze or galvanized ductile iron.
   b. Sleeve: Neoprene.
   d. Bonding jumper: Tinned copper braid.

K. Expansion couplings:
1. Shall allow for expansion and contraction of conduit:
   a. Permitting 8-inch movement, 4 inches in either direction.
2. Constructed to maintain electrical continuity of the conduit system.
3. Materials:
   a. Head: Malleable or ductile iron.
   b. Sleeve: Steel.
   c. Insulating bushing: Phenolic.
   d. Finish: Hot-dip galvanized.

L. Conduit markers:
1. As specified in Section 16075 - Identification for Electrical Systems.

2.4 SOURCE QUALITY CONTROL

A. As specified in Section 16050 - Common Work Results for Electrical.

PART 3 EXECUTION

3.1 INSTALLATION

A. As specified in Section 16050 - Common Work Results for Electrical.

B. General:
1. Conduit routing:
   a. Replace per the existing layout:
      1) Modify conduit runs to suit field conditions, as accepted by the Engineer:
         a) Make changes in conduit locations that are consistent with the design intent but are dimensionally different, or routing to bypass obstructions.
         b) Make changes in conduit routing due to the relocation of equipment.
2) Replace junction boxes and pull boxes per the existing layout:
   a) Provide junction boxes and pull boxes to facilitate wire pulling as required:
      (1) To meet cable manufacturer's pulling tension requirements.
      (2) To limit total conduit bends between pull locations.
   b) Install junction boxes and pull boxes at locations acceptable to the Engineer.

b. The Contractor is responsible for any deviations in general location, conduit size, routing, or changes to the conduit schedule without the express written approval or direction by the Engineer:
   1) The Engineer is the sole source in determining whether the change is constituted as a deviation:
   2) Perform any changes resulting in additional conduits, or extra work from such deviations.
   3) Incorporate any deviations on the Record Documents.

2. Use only tools recommended by the conduit manufacturer for assembling the conduit system.

3. Provide adequate clearances from high-temperature surfaces for all conduit runs. Provide minimum clearances as follows:
   a. Clearance of 6 inches from surfaces 113 degrees Fahrenheit to 149 degrees Fahrenheit.
   b. Clearance of 12 inches from surfaces greater than 149 degrees Fahrenheit.
   c. Keep conduits at least 6 inches from the coverings on hot water and steam pipes, 18 inches from the coverings on flues and breechings, and 12 inches from fuel lines and gas lines.
   d. Where it is necessary to route conduits close to high-temperature surfaces, provide a high-reflectance thermal barrier between the conduit and the surface.

4. Support conduit runs on water-bearing walls a minimum of 7/8-inch away from wall on an accepted preformed channel:
   a. Do not run conduits within water-bearing walls.

5. Do not install 1-inch or larger conduits in or through structural members unless approved by the Engineer.

6. Run conduits exposed to view parallel with or at right angles to structural members, walls, or lines of the building:
   a. Install straight and true conduit runs with uniform and symmetrical elbows, offsets, and bends.
   b. Make changes in direction with long radius bends or with conduit bodies.

7. Install conduits with total conduit bends between pull locations less than or equal to 270 degrees.

8. Route all exposed conduits to preserve headroom, access space and work space, and to prevent tripping hazards and clearance problems:
   a. Install conduit runs so that runs do not interfere with proper and safe operation of equipment and do not block or interfere with ingress or egress, including equipment-removal hatches.
   b. Route conduits to avoid drains or other gravity lines. Where conflicts occur, relocate the conduit as required.

9. Conduits may be run in concrete members or slabs with permission of the Engineer.

10. When installing conduits through existing slabs or walls, make provisions for locating any possible conflicting items where the conduit is to penetrate. Use
tone signal or X-ray methods to make certain that no penetrations will be made into the existing conduits, piping, cables, post-tensioning cables, etc.

11. Plug conduits brought into pull boxes, manholes, handholes, and other openings until used to prevent entrance of moisture.
12. Install conduits through wall and floor seals where indicated in the field.
13. For existing and new 2-inch and larger conduit runs, snake conduits with a conduit cleaner equipped with a cylindrical mandrel of a diameter not less than 85 percent of nominal diameter of the conduit:
   a. Remove and replace conduits through which mandrel will not pass.
14. Provide all sleeves and openings required for the passage of electrical raceways or cables where indicated in the field.
15. Install complete conduit systems before conductors are installed.
16. Provide metallic conduits terminating in transformer, switchgear, motor control center, or other equipment conduit windows with grounding bushings and ground with a minimum No. 6 AWG ground wire.
17. Underground conduits:
   a. Install underground conduits, including conduit runs below slabs-on-grade in concrete-reinforced duct bank construction:
   b. Make underground conduit size transitions at handholes and manholes.
   c. Install spare conduits in underground duct banks towards top center of runs to allow for ease of installation of future cables as conduits enter underground manholes and handholes.
   d. Seal around conduit penetrations of below grade walls with a mechanical seal.

C. Lighting and receptacle conduits:
   1. Provide conduit runs for lighting and receptacle circuits.
   2. Install conduits in accordance with the requirements of this Section unless otherwise indicated.
   3. Minimum conduit size:
      a. 3/4-inch for exposed conduits.
      b. 1-inch for underground or in-slab conduits.

D. Hazardous areas:
   1. As specified in Section 16050 - Common Work Results for Electrical for hazardous areas and specific Class and Division.

E. Conduit usage:
   1. Exposed conduits:
      a. PVC-coated Rigid conduit:
         1) Install the rigid conduit type for each location as per the existing layout.
         2) Minimum size: 3/4-inch.
      b. Flexible conduit:
         1) Use flexible conduit for final connections between rigid conduit and motors, vibrating equipment, instruments, control equipment, or where required for equipment servicing:
            a) Use Type SLT with rigid metallic conduit.
         2) Minimum size: 3/4-inch:
            a) 1/2 when required for connection to instruments.
         3) Maximum length:
            a) Fixed equipment:
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<td>36</td>
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<td>3-1/2</td>
<td>38</td>
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</table>

b) Removable instruments or hinged equipment:
   (1) As required to allow complete removal or full movement without disconnecting or stressing the conduit.

2. Concrete-encased and embedded conduits:
   a. Type PVC Schedule 40 and PVC-coated rigid metallic conduit as specified below:
      1) Use Type PCS in underground and embedded installation as follows:
         a) Stub-up and risers to grade floor or equipment from nonmetallic conduits.
         b) Entering and exiting underground or embedded conduit runs a minimum 12 inches above and below grade of finished floor.
         c) For any and all bends where the total deflection is greater than 45 degrees.
   b. Minimum size:
      1) 2-inch in duct banks.
      2) 1-inch for in-slab conduits.

3. Concrete capped, pea gravel-bedded duct bank conduits:
   a. Type PVC80.

4. PVC-coated rigid metallic conduit:
   a. Use specifically manufactured or machined threading dies to manufacturer's specifications to accommodate the PVC jacket.

5. GRC:
   a. Conduit shall be cut square and reamed before threading.

6. PVC:
   a. Conduit terminations shall be via threaded adapters into threaded hubs on the junction boxes or conduit bodies.
   b. Conduit terminations into boxes without threaded hubs shall utilize a threaded adapter and a flat neoprene washer on the outside of the box.
      1) Use a locknut on the inside of the box to tighten the adapter to the box.
c. Route conduit to afford it the maximum physical protection.
   1) If necessary, cover conduit to afford additional protection when it
      cannot be shielded by the structure or machinery frames.
      a) Use Schedule 80 where exposed runs may be subject to
         physical damage.

F. Conduit joints and bends:
1. General:
   a. Where conduit is underground, under slabs on grade, exposed to the
      weather, or in NEMA Type 4 or NEMA Type 4X locations, make joints
      liquid-tight.
   b. Keep bends and offsets in conduit runs to an absolute minimum.
   c. All bends shall be symmetrical.
   d. The following conduit systems shall use large-radius sweep elbows:
      1) Underground conduits.
      2) Conduits containing shielded cables.
   e. Provide large-radius factory-made bends for 1-1/4-inch trade size or
      larger.
   f. Make field bends with a radius of not less than the requirements found in
      the NEC:
      1) The minimum bending radius of the cable must be less than the
         radius of the conduit bend.
      2) Make all field bends with power bending equipment or manual
         benders specifically intended for the purpose:
         a) Make bends so that the conduit is not damaged and the internal
            diameter is not effectively reduced.
         b) For the serving utilities, make bends to meet their requirements.
   g. Replace all deformed, flattened, or kinked conduit.

2. Threaded conduit:
   a. Cut threads on rigid metallic conduit with a standard conduit-cutting die
      that provides a 3/4-inch per foot taper and to a length such that all bare
      metal exposed by the threading operation is completely covered by the
      couplings or fittings used. In addition, cut the lengths of the thread such
      that all joints become secure and wrench-tight just preceding the point
      where the conduit ends would butt together in couplings or where conduit
      ends would butt into the ends or shoulders of other fittings.
   b. Thoroughly ream conduit after threads have been cut to remove burrs.
   c. Use bushings or conduit fittings at conduit terminations.
   d. On exposed conduits, repair scratches and other defects with galvanizing
      repair stick, Enterprise Galvanizing "Galvabar™", or CRC "Zinc It."
   e. Coat conduit threads with an approved electrically conductive sealant and
      corrosion inhibitor that is not harmful to the conductor insulation:
      1) Apply to the male threads and tighten joints securely.
      2) Clean excess sealant from exposed threads after assembly.
   f. Securely tighten all threaded connections.
   g. Any exposed threaded surfaces must be cleaned and coated with a
      galvanizing solution so that all exposed surfaces have a galvanized
      protective coating.

3. PVC:
   a. Use approved solvent-weld cement specifically manufactured for the
      purpose. Spray-type cement is not allowed.
b. Apply heat for bends so that conduit does not distort or discolor. Use a spring mandrel as required to ensure full inside diameter at all bends:
   1) Utilize a heater specifically for PVC conduit as recommended by the conduit manufacturer.

G. Conduit sealing and drainage:
   1. Conduit drainage and sealing other than required for hazardous and classified areas:
      a. Provide sealing and drainage in vertical drops of long (in excess of 20 feet), exterior, above-grade conduit runs at the points at which the conduit enters buildings, switchgear, control panels, lighting panelboards, and other similar enclosures.
      b. Provide seal fittings with drains in vertical drops directly above grade for exterior and above-grade conduit runs that are extended below grade.
      c. Provide conduit seals with drains in areas of high humidity and rapidly changing temperatures:
         1) Where portions of an interior raceway pass through walls, ceilings, or floors that separate adjacent areas having widely different temperatures.
      d. Provide conduit seals similar to O-Z/Gedney (Type CSM) on all conduits between corrosive and non-corrosive areas.
      e. Seal one end only of all underground conduits at highest point with O-Z/Gedney sealing (non-hazardous) filling, or equal.

   2. Install seals with drains at any location along conduit runs where moisture may condense or accumulate. This requirement includes, but is not limited to, the following locations: control panels, junction boxes, pullboxes, or low points of the conduit.

H. Conduit supports:
   1. General:
      a. Provide appropriate hangers, supports, fasteners, and seismic restraints if, upon the determination of the Engineer, that the existing hangers cannot be reused or additional hangers are required for the nature of the work:
         1) Provide support materials consistent with the type of conduit being installed as specified in Section 16050 - Common Work Results for Electrical.
      b. Support conduit at the intervals required by the NEC.
      c. Perforated strap and plumbers tape are not acceptable for conduit supports.

   2. Conduit on concrete or masonry:
      a. Use wedge anchors in concrete when possible.
      b. Use pipe spacers (clamp backs) in wet locations.
      c. On plaster or stucco, use 1-hole malleable iron straps with toggle bolts.

   3. Conduit on metal decking:
      a. Use 1-hole malleable iron straps with 1-inch long cadmium-plated Type A panhead sheet-metal screws. Fully or partially hammer-driven screws are not acceptable.
4. Suspended conduit:
   a. Use malleable-iron factory-made split-hinged pipe rings with threaded suspension rods sized for the weight to be carried (minimum 3/8-inch diameter), Kindorf, or equal.
   b. For grouped conduits, construct racks with threaded rods and tiered angle iron or preformed channel cross members. Clamp each conduit individually to a cross member. Where rods are more than 2-feet long, provide rigid sway bracing.

5. Supports at structural steel members:
   a. Use beam clamps.
   b. Drilling or welding may be used only as specified or with approval of the Engineer.

6. PVC-coated rigid metal systems:
   a. Provide right-angle beam clamps and "U" bolts specially formed and sized to snugly fit the outside diameter of the coated conduit. Provide "U" bolts with PVC-encapsulated nuts that cover the exposed portions of the threads.
   b. Securely fasten exposed conduits with Type 316 stainless steel clamps or straps.

I. Expansion or expansion/deflection fittings:
   1. General:
      a. Align expansion coupling with the conduit run to prevent binding.
      b. Follow manufacturer's instructions to set the piston opening.
      c. Install expansion fittings across concrete expansion joints and at other locations where necessary to compensate for thermal or mechanical expansion and contraction.
      d. Furnish fittings of the same material as the conduit system.
   2. For metallic conduit, provide expansion or expansion/deflection couplings, as appropriate, where:
      a. Install expansion fittings a minimum of every 200 feet in straight conduit runs.
   3. For PVC, provide expansion or expansion/deflection couplings, as appropriate, where length change due to temperature variation exceeds 2 inches:
      a. Rigidly fix the outer barrel of the expansion coupling so it cannot move.
      b. Mount the conduit connected to the piston loosely enough to allow the conduit to move as the temperature changes.

J. Empty conduits:
   1. Provide a polyethylene rope rated at 250 pounds tensile strength in each empty conduit more than 10 feet in length.
   2. Provide 1 empty 3/4-inch conduit for each 4 spare unused circuits or spaces of each flush-mounted branch circuit panelboard. Terminate empty 3/4-inch conduits in individual junction boxes that are accessible to enable extension of future branch circuits.
   3. Seal ends of all conduits with approved, manufactured conduit seals, caps, or plugs immediately after installation:
      a. Keep ends sealed until immediately before pulling conductors.
K. Miscellaneous:
   1. Seal roof penetrations for raceways and other items that penetrate the roof in accordance with roofing manufacturer’s instructions and as indicated on the Drawings.
   2. Provide electrical unions at all points of union between ends of rigid conduit systems that cannot otherwise be coupled:
      a. Running threads and threadless couplings are not allowed.
   3. Replace any conduits installed that the Engineer determines do not meet the requirements of this Specification.
   4. Provide conduit housekeeping curb around all embedded or below-grade conduits exiting or entering the slab, per standard industry details.

3.2 COMMISSIONING

   A. As specified in Section 13100 – Clarifier Drive Replacement.

3.3 FIELD QUALITY CONTROL

   A. As specified in Section 16050 - Common Work Results for Electrical.

3.4 PROTECTION

   A. As specified in Section 16050 - Common Work Results for Electrical.

END OF SECTION
Appendix A

PHOTOGRAPHIC EXHIBITS and EXISTING REFERENCE DOCUMENTS

The following information is provided solely for the convenience of the bidder/Contractor. The bidder/Contractor shall procure and conform to the requirements of the latest standards, drawings, permits, or data from the governing jurisdictional agency that are relevant to the Work specified in the Contract Documents.
PHOTOGRAPHIC EXHIBITS

The following Photographic Exhibits are provided:

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<tr>
<td>1</td>
<td>Pre-purchased Clarifier Drives &amp; Aerial View of WRF</td>
</tr>
<tr>
<td>2</td>
<td>Existing Clarifier Photos</td>
</tr>
<tr>
<td>3</td>
<td>Existing Clarifier Photos II</td>
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<tr>
<td>4</td>
<td>Existing Clarifier Photos III</td>
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PRE-PURCHASED CLARIFIER DRIVE WITH CHAIN DRIVE COVER REMOVED

LEGEND AND KEYNOTES

1. STORAGE BUILDING HOUSING PRE-PURCHASED CLARIFIER DRIVES
2. NORTHERLY SECONDARY CLARIFIER
3. SOUHERLY SECONDARY CLARIFIER
4. MAIN PLANT ENTRANCE OFF DOVE CANYON ROAD
5. PLANT OPERATIONS BUILDING
6. CONTRACTOR SHALL PREPARE CLARIFIER DRIVES AS NECESSARY TO PREVENT DAMAGE FOR TRANSPORT TO SECONDARY CLARIFIER

NOTE:
THESE EXHIBITS ARE FOR CONVENIENCE OF THE CONTRACTOR AND DEPICT SITE CONDITIONS DURING THE MARCH 2018 TIME FRAME. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS THAT MAY AFFECT THE WORK AND COORDINATE ALL FIELD ACTIVITIES WITH THE DISTRICT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
NOTE:

These exhibits are for convenience of the contractor and depict site conditions during the March 2018 time frame. Contractor shall fully verify existing conditions that may affect the work and coordinate all field activities with the district in accordance with the contract documents.
CLARIFIER WALKWAY EMPTY TANK SHOWING CENTER SUPPORT COLUMN AND FEEDWELL

CENTER COLUMN BELOW WALKWAY SHOWING STRUCTURAL SUPPORTS AND EXISTING CLARIFIER DRIVE BASE PLATE

EXISTING CLARIFIER DRIVE AND ENCLOSURE

KEYNOTES:

- ADJUST ENCLOSURE MOUNTING AND MODIFY GRATING AS REQUIRED FOR INSTALLATION OF PRE-PURCHASED CLARIFIER DRIVES

NOTE:

THESE EXHIBITS ARE FOR CONVENIENCE OF THE CONTRACTOR AND DEPICT SITE CONDITIONS DURING THE MARCH 2018 TIME FRAME. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS THAT MAY AFFECT THE WORK AND COORDINATE ALL FIELD ACTIVITIES WITH THE DISTRICT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
EXISTING REFERENCE DOCUMENTS

EIMCO C3 Component Clarifier W/C30HT Drive 3-ME-1 & 2
Serial No. BAP0207-500 A thru B for

4S Ranch Wastewater Plant Upgrade, Rancho Bernardo, CA:

<table>
<thead>
<tr>
<th>DRAWING NO.</th>
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<td>PART 4 – PARTS LIST</td>
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<td>General Arrangement Clarifier 65'-0&quot; Dia. C3 Type</td>
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<td>General Erection 65&quot;-0&quot; C3 Clarifier</td>
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<td>115759</td>
<td>Drive Control Weather and Explosion Proof</td>
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<td>115197</td>
<td>General Arrangement</td>
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FOREWORD

To ensure complete warranty coverage of the equipment thoroughly read and familiarize yourself with the instructions in this manual.

It is Baker Process' sincere desire that this equipment will give dependable, efficient and economical operation throughout the entire period of service. To achieve this kind of performance and ensure full warranty coverage, it is important to thoroughly read and understand the contents of this manual before the unit is installed, adjusted, or operated.

The equipment, including the accessory equipment furnished but not built by Baker Process, must be stored, installed, operated and maintained according to these instructions to ensure the warranty coverage.

The instructions in this manual are based on information available at the time of issue of this manual; the right is reserved to make subsequent changes to the instructions without obligation to replace existing copies.

English is the governing language. When manuals are provided in both English and any language other than English, THE NON-ENGLISH TRANSLATION IS PROVIDED ONLY AS A CONVENIENCE. The English translation will govern in case of minor discrepancies. In the event of major discrepancies, notify your Baker Process Representative immediately. Refer to the "Offices" page in this manual for applicable address and telephone number.

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Before You Erect It Your Way

Let Us Show You Our Way.

Read the Instructions

These instructions are based on years of field experience. We selected the best procedures from that experience and put them together to give you our best suggested method of erection. Consider them. They will save you time and money.

But -

- If you believe you have a better way, call us first anyway.

- If you want assistance or a pre-erection conference before you start, call us.

- If problems should occur, call us at once.

Contact your Baker Process Representative. Look for his address on the Offices page at the end of these instructions.
Baker Process does not anticipate problems with the erection of this equipment. However, due to the nature of fabricated steel equipment, the erector may require a certain amount of field fit-up and adapting work. This is considered to be a normal part of erection, as well as the use of such tools as come-alongs, welding and cutting torches, and drift pins. But in case of problems, the following will apply:

A. The AISC "Code of Standard Practice", latest edition, specifically states under "Correction of Errors" that cutting, reaming and use of drift pins are a part of standard erection practice:

"Normal erection operations include the correction of minor misfits by moderate amounts of reaming, chipping, welding or cutting, and the drawing of elements into line through the use of drift pins. Errors that cannot be corrected by the foregoing means or that require major changes in member configuration are reported immediately to the owner and fabricator by the erector. This is done in order to enable whoever is responsible either to correct the error or to approve the most efficient and economic method of correction to be used by others."

B. Should a problem develop because of fabrication or engineering errors, Baker Process will not accept back charges unless they are authorized in advance and in writing by your Baker Process Project Manager. Before corrective work is started, the erector must obtain a Baker Process Field Work Order that must include a cost limitation. Payment may be refused for corrective work that is done without the above authorization.

Authorized charges will be paid only on the basis of standard direct field labor hours, material, and variable overhead. Other charges will not be allowed.

C. Drawings and erection or installation instructions must be followed. The drawings will govern in case of minor discrepancies. In the event of major discrepancies, notify your Baker Process Representative immediately, referring to the index for the "Offices" page.

D. If a protective coating (paint, rubber, etc.) is to be applied to the mechanism, it may need to be applied to some parts before they are installed. Parts that must be coated before installation are those that would be inaccessible after installation.

**WARNING:** The fumes given off during welding and cutting can be injurious to the operator's health. Some fumes, such as those produced when working with Zinc, Cadmium and painted surfaces can be toxic.
RECEIVING AND INSPECTION

Although all possible precautions are taken to protect the equipment against damage or losses during shipment, before accepting the shipment check all items against the packing list for shortages and inspect for evidence of physical damage. In either case, immediately notify the carrier or note on the delivery ticket "Accepted subject to full inspection after unpacking". Notify Baker Process within 7 days (maximum) in case of shortages or discrepancies in the amounts received according to the packing list. If not notified, Baker Process will not be responsible for replacing those items.

Keep a record of all claims and correspondence. Photographs are recommended.

PACKING BOXES AND COVERS

Do not remove protective covers unless there are indications of damage. Boxes opened for inspection and inventory should be carefully repacked to ensure protection of the contents or else the parts should be packaged and stored in a safe place. Examine all packing boxes, wrappings and covers for items attached to them, especially if they are to be discarded. Refer to the Storage Instructions.

SHIPPING BRACES AND BARS

All braces, bars, etc., that are required for shipment, but are not a part of the mechanism, should not be removed until necessary for installation or removal from the carrier. Shipping braces are marked "SHIPPING BRACE ONLY" with white painted letters or they are painted purple.

STORAGE

When the equipment is not to be installed immediately, refer to the storage instructions. These are important to ensure warranty protection.

ERECTION BOLTS

Check these against the packing lists to avoid shortages later in assembly.
Equipment stored or out of use for more than 30 days must be protected against corrosion and damage.

**ACCESSORY EQUIPMENT**

For storage and maintenance of equipment furnished but not built by Baker Process, refer to the Manufacturer's Instructions at the back of this manual.

**EIMCO DRIVE EQUIPMENT**

Failure to comply with these storage instructions will void Baker Process' warranty.

**Drive Shipped from Factory**

EIMCO drives received in shipment can be stored as long as 24 months, taking into account the in transit time. No special precautions are required other than those listed below.

Note: All drive unit machined surfaces are coated with LPS #3 which is a rust inhibitive agent good for approximately 24 months storage. No storage oil is required and, in fact, must not be used since LPS #3 will dissolve in oil or most other petroleum based products. Therefore, do not add oil etc. to the drive unit until it will be operated. If storage time is to exceed 24 months, contact Baker Process for long term storage information.

1. Store the drive(s) in normal operating position. If possible, store the drive(s) indoors in a dry, well-ventilated place with a relatively constant temperature. Do not add oil. See note above.

2. When drive equipment is not installed, but must be stored outdoors:

   a. Use wooden blocks to elevate above ground, arranged for even and firm support. Shipping crates or skids will often do. Make certain storage area is not where water can collect.

   b. If protective covers have been removed or damaged, cover with canvas or protective tarpaulin, but allow adequate ventilation. Do not use space heaters.

   c. Whenever possible, store in a shaded area protected against the sun and wind. This should also be an area away from moving equipment.

**Drive Installed-Long Term Storage**

Failure to comply with these storage instructions will void Baker Process' warranty.
The following precautions cover non-operation or shutdown periods that exceed two months. They apply to the EIMCO or accessory mechanical drive equipment that has been installed and operated. Keep records and schedules to ensure compliance with instructions.

Note: As LPS #3 will dissolve in and is compatible with oil, it is not necessary to remove it using solvents before adding oil.

Plan #1 - Power Available

When power is available, lubricate and operate the equipment about five minutes, or run it through a complete cycle once each week. Remove accumulated water from drives each month at drain plugs. Refer to the accessory equipment manufacturer’s instructions for additional information.

**WARNING:** In climates where snow and ice might accumulate in the tank, do not operate the drive. Follow Plan #2.

Plan #2 - No Power Available

Fill housing and gear cases with clean oil to maximum level. A rust inhibitive agent is recommended for adding to the oil. Check that all greased bearings are well lubricated. Cover seals, screws, chains and guides with heavy grease and cover breather caps with tape. Cover with tarpaulins, but allow ventilation. Space heaters or dehumidifiers should operate continuously.

Once each month open drain plugs to remove accumulated water and return oil to maximum level. Check all greased items monthly for adequate covering. On variable speed drives, make certain condensate plugs are removed from the speed housing.

When the storage period extends into seasonable warm or cold weather, drain all gear housings and flush them with oil to remove residual water after the storage period. Do not flush with solvents. Refill with oil up to normal operating level.

**WARNING:** Before the drive equipment is put into operation after storage, drain all oil and lubricate according to instructions. Re-lubricate all greased bearings and pump out old grease. Check motor windings. Refer to Accessory Equipment Manufacturer’s Instructions.

**STORAGE PRECAUTIONS - STRUCTURAL**

1. Inspect painted surfaces for deterioration of paint. Apply finish coats as soon as possible. When this is not possible, remove rust or corrosion and paint, as necessary.

2. For shop primed steel equipment, refer to the special "Paint Durability" precautions below.
Note: Shop primer paint durability

Shop primer paints are intended to serve only as a bonding coat between metal surfaces and protective finish or seal coats and act as a minimal protective finish. Baker Process will not be responsible for condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect painting in shops for proper preparation and application prior to shipment. Baker Process assumes no responsibility for field surface preparation or touch up of shipping damage to paint. Painting of fasteners and other touch up to painted surfaces will be by Purchaser's painting contractor after mechanism erection.

3. Identification tags that are removed for painting prior to assembly must be reattached to the original components for correct identification. Assistance from Baker Process will be charged at the normal service rate.

4. Lubrication plates, WARNING and CAUTION signs, and the Baker Process (EIMCO) nameplate must be masked off prior to field painting. Do not remove these signs/plates from the drive. After field painting is completed, make sure that Lubrication plates, WARNING and CAUTION signs, and the Baker Process (EIMCO) nameplate are clearly visible and readable.

**DRIVE UNIT VENT CAUTION:** Vent holes in vented pipe plugs (if used) and sight glass vent openings must be kept clear of dirt, paint or other foreign material.
The tank must conform to specifications in order to accommodate the mechanism. If the tank fails to meet these specifications, requiring any modifications of the equipment, Baker Process will not accept charges. Check the tank as follows:

CHECK the elevation at the walkway mounting surfaces at (1) only.

![Figure 1](image)

Figure 1

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Walkway Mounting Surface</td>
<td>8-</td>
</tr>
<tr>
<td>2-</td>
<td>Influent Column Base</td>
<td>9-</td>
</tr>
<tr>
<td>3-</td>
<td>True Center</td>
<td>10-</td>
</tr>
<tr>
<td>4-</td>
<td>Anchor Bolts</td>
<td>11-</td>
</tr>
<tr>
<td>5-</td>
<td>Anchor Bolts</td>
<td>12-</td>
</tr>
<tr>
<td>6-</td>
<td>Wall Bolts</td>
<td>13-</td>
</tr>
<tr>
<td>7-</td>
<td>Tank Bottom Corner</td>
<td>14-</td>
</tr>
</tbody>
</table>

CHECK the elevation at the influent column base at (2).

CHECK for true center at (3) in order to check the anchor bolts at location (4) and (5) and the wall circumference at (7).
CHECK that the anchor bolts at (4) are concentric with true center of the tank and that the bolts are located with respect to the walkway centerline, as shown on the drawings.

CHECK all anchor bolts at location (4) and (5) for proper size, projection, elevation and orientation. Wall bolts at (6) should be on a radial line with true center.

CHECK the tank bottom for specified diameter all around at (7) and for specified slope (8) at approximate 90° locations around the tank.

CHECK the influent opening (9) for proper diameter.
Correct installation, leveling and adjustment of the weirs, baffles and scum box are important for proper operation of the mechanism. Installation can take place at anytime during the installation of the mechanism.

WEIRS

1. Install the weirs with washers in position on the anchor bolts. Center them in their mounting holes and snug the nuts. Application of a mastic sealer during the installation is recommended to prevent leakage between the weirs and the launder. (Mastic sealer is not by Baker Process).

2. The weirs must be level. Check them with a surveyor’s level. Adjust for level as necessary and secure all fasteners. Final level may also be made later with water in the tank. In that case, set all weirs equal distance from the water level when there is no flow.

BAFFLES

1. Installation

Mount and secure the outer baffle supports to the tank wall as shown on the General Arrangement Drawing. Then mount the inner supports to the outer supports using the fasteners specified. Adjust them according to the specified dimensions, and snug the bolts.

Install the baffles and butt plates, and center them in the slotted holes. Secure the fasteners.

Note: A straight baffle section is provided for use at the scum box. Refer to the General Arrangement and General Erection Drawings.

2. Adjustment

Revolve the rake arms until the outer end of the skimmer arm (pipe) is over the scum box. Measure the horizontal distance from the end of the skimmer arm (pipe) to the scum baffle. Revolve the machine and adjust the baffle assemblies to obtain this same horizontal distance adjustment for concentricity. Then secure all bolts.

SCUM BOX

In most cases the baffles should be installed ahead of the scum box, but the adjustments should be made at the same time.

1. The scum box nozzle connects to the scum pipe (not by Baker Process) with a flexible coupling (not by Baker Process). Slip the coupling over the end of the scum pipe before the scum box is installed.
2. Locate and install the wedge anchors as indicated on the General Arrangement Details and Skimming Mechanism Erection Drawings.

3. Mount the scum box supports to the anchors, using the washers provided, and mount the scum box to the supports.

4. Adjust the scum box for elevation and level referring to the drawings. When the skimming device is installed, adjust the box for concentricity with the device and recheck elevation and level. Adjust the scum box as follows:

   Radial Adjustment: Slots in scum box
   Vertical Adjustment: Slots in supports
   Level Adjustment: Shim between scum box supports and wall, and baffle adjustments

5. Field drill mounting holes in the baffles using the scum box as a template. Then, connect the scum box to the baffle using the bolts, nuts and washers specified.

6. Secure all fasteners. Then connect scum box nozzle to the scum piping (not by Baker Process), as specified on the drawings.
1. Install the column leveling nuts (1) with top faces of the nuts set for the specified top of grout elevation.

2. **CHECK** all nuts for level with a combination straight edge and machinist’s level or a surveyor’s level (transit). Check for specified top of grout elevation.

![Figure 2](image)

<table>
<thead>
<tr>
<th>Figure 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Leveling nuts</td>
</tr>
<tr>
<td>2- Column</td>
</tr>
<tr>
<td>3- Locking nuts</td>
</tr>
<tr>
<td>4- Check for plumb</td>
</tr>
<tr>
<td>5- Check for plumb</td>
</tr>
<tr>
<td>6- Temporary dam for grout</td>
</tr>
</tbody>
</table>

3. Construct a temporary dam for the grout (6) around the influent opening to hold back the grout during the grouting of the column.
4. Set the column on the leveling nuts with the "V" notch in the column flange in line with the centerline for the walkway. Then, snug the leveling nuts (1) against the flange. Install the upper locking nuts (3) and tighten by slugging with a slug wrench.

5. **CHECK** the column for plumb. Reasonable allowance is 1/8" (3.2 mm) in 10’ (3 m) overall, that is (4) minus (5).

   Note: Checking and adjustment must be done when the influent column is a uniform temperature, such as the early morning or an overcast day.

6. Adjust for plumb with the leveling nuts (1). Make sure the upper nuts (3) are slugged after each adjustment.

   Note: Do not grout under the column. This will be done following final leveling of the drive.
The dispersion well (3) fits between and is assembled with the upper cage (4) and lower cage (1) sections. Since the cage sections are furnished in single pieces, they must be in place around the column before the drive is installed.

1. The cage and dispersion well can be assembled either (1) in place around the column or (2) separately from the column, as follows.

A. Follow one of the two methods of assembly:

1. If the cage and dispersion well are to be assembled around the column, start with the bottom cage section and work upwards:
   a. Set the lower cage (1) over the column, and allow it to sit on the column base. The corner braces (6) will be installed later.
   b. Assemble the dispersion well sections (3), as shown on the General Erection Drawing.
   c. Connect the upper cage (4) temporarily to the dispersion well (3). Then set the assembly in place on the lower cage (1).
   d. The cage sections can be (a) joined and mounted as a unit to the drive, after the drive is installed, or (b) installed one at a time, starting with the upper cage. **CHECK** orientation of the dispersion well flow gates, referring to the Drawings. See the "Note" below.
   e. The feedwell supports (5) also serve as the cage panel members. Install the supports either before or after the cage has been placed around the column, but install them before the rake arms are installed. Do not weld the supports to the cage at this time.

---OR---

2. If the cage and dispersion well are to be assembled separately from the column, assemble the cage sections with the dispersion well sandwiched between.
   a. Assemble the dispersion well sections (3), as shown on the General Erection Drawing.
   b. Assemble the cage sections with the dispersion well being sure to orient the dispersion well flow gates as specified on the drawings. Refer to the "Note" below.
c. Install the assembly over the column, allowing it to sit on the column base. The corner braces (6) will be installed later.

d. The feedwell supports (5) also serve as the cage panel members. Install the supports either before or after the cage has been placed around the column, but install them before the rake arms are installed. Do not weld the supports to the cage at this time.

B. **CHECK** the Cage for Alignment

**CHECK** for alignment of the cage, preferably using a transit.

Adjust the cage sections and dispersion well, if necessary, by shimming between the dispersion well and the flanges of the cage sections.
The drive unit is shipped fully assembled, including the drive control (overload cutout device). The main drive housing, to which the cage attaches, is on the bottom and the worm drive assembly is on top.

1. **Lift the Drive Unit**

   Lift and install the drive as a complete assembly, using the two eye bolts and wrapping a 3rd lifting cable around the worm gear housing, through the opening in the drive cover, as shown in Figure 4. Do not allow the cable to contact the drive control.

![Figure 4](image)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eye Bolts</td>
</tr>
<tr>
<td>2</td>
<td>Lifting Cable</td>
</tr>
<tr>
<td>3</td>
<td>Opening In Cover</td>
</tr>
<tr>
<td>4</td>
<td>End Of Worm Gear Housing</td>
</tr>
<tr>
<td>5</td>
<td>Cable Wrapped Around End Of Worm Gear Housing</td>
</tr>
<tr>
<td>6</td>
<td>Cable From Eye Bolt (2 Cables From Each Eye Bolt)</td>
</tr>
<tr>
<td>7</td>
<td>Lifting Eye Bolt</td>
</tr>
<tr>
<td>8</td>
<td>Drive</td>
</tr>
</tbody>
</table>

2. **Install the Drive**

   **CHECK** the mounting surface of the drive housing for foreign matter and the column mounting flange for spatter or other foreign matter. Remove as necessary for a clean flat surface.

   Place the drive unit on the column, orienting as shown on the General Arrangement Drawing.
3. Mounting Bolts

Insert but do not tighten the drive mounting bolts. Note that some drives have (2) tapped mounting holes, one on each side of the pinion pocket, due to inaccessibility of the bolts and nuts for installation. If the holes are tapped, install the mounting bolts by running them up through the flange of the column, then into the threaded holes in the drive base. Only these 2 holes are tapped. The other mounting holes use nuts and bolts, which are installed by running them down through the drive base and through the column flange. (Nuts are not required at tapped holes.)

4. Level the Drive

At this point in the erection the drive will be adjusted for near level, using a carpenter’s level and the leveling jackscrews. After installation of the arms and cage, the drive will be adjusted for final level by shimming.

CHECK the drive for level, using a 4" carpenter’s level placed on the leveling surface of the main drive cover. Check in two directions (90°).

Figure 5

<table>
<thead>
<tr>
<th></th>
<th>Figure 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive</td>
</tr>
<tr>
<td>2</td>
<td>Column</td>
</tr>
<tr>
<td>3</td>
<td>Wedge</td>
</tr>
<tr>
<td>4</td>
<td>Leveling Screw</td>
</tr>
<tr>
<td>5</td>
<td>Wedge</td>
</tr>
<tr>
<td>6</td>
<td>Leveling Screw</td>
</tr>
</tbody>
</table>

a. Remove, clean and lubricate the jackscrews in the drive base, then reinstall the jackscrews.

b. Adjust for level using the jackscrews.

c. After leveling, support the drive using wedges at the jackscrews.
d. Install the drive hold-down bolts and snug tighten only. Do not torque.

e. Final leveling of the drive will follow installation of the rake arms.

**LUBRICATION WARNING:** The drive is shipped from the factory without operating lubricant.

**SANDBLASTING WARNING:**

The Baker Process main drive unit and motor drives must be fully covered or sealed off to protect against sand and dust when sandblasting in their vicinity. All external openings, including vents and oil fill plugs and the space between the rotating main gears and stationary bases on the main drive, should be taped closed, covered with polyethylene film, or stuffed with oakum or rag waste. After sandblasting and before start-up, drain a portion of oil from the drive through nylon stocking to be sure grit has not penetrated the drive. Remove all covers.

Failure to observe this **WARNING** will void the drive warranty.
1. Referring to Figure 4, attach the cage to the drive unit, using the vertical adjusting bolts (6) and nuts (7).

2. Loosely install the bolts and nuts (5), including the washers. Shim between the drive and cage for a snug fit and concentricity (centering) about the drive. (Shims not by Baker Process.)

3. Using the adjusting bolts (6) and adjusting nuts (7), raise the cage to its highest position. In some cases it may be necessary to raise the cage with jacks.

4. **CHECK** the cage for plumb, using a carpenter’s level.

   Note: Final check for plumb and centering will follow drive leveling.

5. Adjust the cage for plumb using the adjusting nuts (7), and then secure the bolts (5). Do not torque the bolts (5). Secure the jam nuts (8).

---

**Figure 6**

| 1- | Top Of Influent Column |
| 2- | Rake Drive |
| 3- | Drive Platform Or Upper Drive |
| 4- | Shim As Required For A Tight Fit |
| 5- | Bolt, Nut And Washer |
| 6- | Adjusting Bolt (Capscrew) |
| 7- | Adjusting Nut |
| 8- | Jam Nut |
| 9- | Cage (Reference) |
To prevent misalignment or damage to the cage, install the arms as a pair and support the arms with blocking arranged so that the connection to the cage will not be forced.

1. Set the arms (3) in position at the cage, supported by blocking (7) for the specified clearance with the tank bottom plus 9/16” shop provided camber (4). See Figure 7. Adjust the arms so they are square with the cage with the arm connections adjacent their matching holes.

2. Connect the arms to the cage and snug tighten the bolts.

3. Install the sump blades on the arms according to the part numbers on the Rake Arm Erection Drawing. Make sure the arms remain square during installation.

4. The arms must be in straight alignment and square with the centerline of the cage. Shim (2) at the two lower connections if necessary for arm alignment. If there is a gap at one of the two upper connections, shim (2) as necessary for a tight fit.

Tighten all bolts, but do not force the connection in order to close a gap, since this will put a twist in the arm or cause damage to the arm-to-cage connection. Close the gap by shimming.
5. Remove the blocking (7) equally from each arm, beginning at the cage and working outward. Check the arm blades for clearance with the tank bottom to be sure they do not touch. (Final arm level will be checked later.) Refer to "Clearance Adjustment" below.

6. If arm adjustment is necessary, use jacks placed near the outer ends of the arms for lifting. Shim equally at either the bottom or top connections to adjust for elevation.

7. The squeegees will be installed after tank grouting.

CLEARANCE ADJUSTMENT

If it is necessary to adjust the arms for clearance with the tank bottom, adjust them as a pair, or adjust one arm while supporting the opposite arm with blocking. This is to maintain equal weight on the cage. Shim equally at either the upper or lower connections.
LUBRICATION WARNING

The drives are shipped from the factory without lubricating oil and/or grease.

Refer to the "Lubrication" Instructions in this manual. Refer to the Table Of Contents for Lubrication Instructions page numbers.

DRIVE ROTATION WARNING

Incorrect rotation of the drive and in some cases, rotation of the drive without electrical power, will cause serious damage to the drive and possibly a dangerous build up of torque.

Refer to the "Lubrication, Electrical Wiring, Drive Rotation and Drive Controls" Instructions on a following page.

Do not attempt to operate or rotate the drive (rake arms) before you read those Instructions.
CHECK FOR LEVEL

The main bearing of the rake drive must be level for proper operation of the mechanism and maximum bearing life.

The drive will be checked for level by measuring the level of the drive at the end of a rake arm, at various points around the tank. It will then be shimmed for level.

The drive must be leveled within a maximum out-of-level tolerance of .005 inch [0.127 mm] in 12 inches [304.8 mm] distance. This tolerance will be measured on a large scale using the rake arm, rather than the relatively small area of the drive cover.

1. Set up a surveyor's level near the center of the tank. Using the instrument, mark four level benchmarks on the tank wall at the same height and spaced approximately 90° apart. Refer to the illustration below.

![Figure 8](image)

2. Rotate the drive and stop one (and the same) rake arm at each of the four level points marked around the tank, and using a carpenter's level as an extension from that arm to the tank wall, make the second marks. These are shown as the "Reference Marks" in the illustration.
WARNING: Refer to the "Warnings" on drive rotation and lubrication on a following page under "Lubrication, Electrical Wiring, drive Rotation and Drive Controls."

Note: Checking and leveling must be done when the influent column is a uniform temperature, such as the early morning or an overcast day.

3. Referring to the illustration, compare the difference in dimensions between the level marks and the rake arm reference marks at diametrically opposite sides of the tank.

4. The difference between the two observed dimensions (d1 minus d2) must not exceed the maximum out-of-level dimension below:

<table>
<thead>
<tr>
<th>Mechanism Diameter</th>
<th>Maximum Out-Of-Level Tolerance (d1 minus d2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65'</td>
<td>1/2&quot; [12.70 mm]</td>
</tr>
</tbody>
</table>

SHIM FOR LEVEL

Shimming may be necessary to level the drive. Maximum bearing life of the drive unit main bearing is dependent on proper leveling and shimming. Perfect final leveling is not practical; however, it should be as accurate as possible. As the diameter of the mechanism increases, it becomes increasingly difficult to obtain an accurate adjustment.

In making a final shimming adjustment, care should be taken to tighten the drive mounting bolts equally and to support each drive mounting bolt, as necessary, with the proper thickness of shim material. Uneven tightening and shimming may cause deformation of the bearing race, causing shortened bearing life.

Shims

Use only the stainless steel shims furnished by Baker Process and attached to the drive unit. They are provided in sizes and quantities to satisfy most requirements. If more shims are needed, contact the Baker Process Parts Service Dept., referring to the telephone number in this manual, and refer to the parts list for the shim package part number.

Shimming

1. Use the jackscrews provided in the drive base to level the drive. Be sure to release the drive mounting bolts.

2. CHECK clearances between the drive base and column with a feeler gauge at each of the drive mounting bolts. Mark clearances on the drive base for ready reference.
3. Shim at the mounting bolts, using the Baker Process furnished shims and referring to Figure 9. Insert shims from the outside of the drive to the inside. Since the shims insure the level of the drive for optimum service life of the main bearing, use only these stainless steel shims provided by Baker Process. Do not use any other type of shims or shim material.

![Figure 9](image)

<table>
<thead>
<tr>
<th>Figure 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Drive base</td>
</tr>
<tr>
<td>2- Shims</td>
</tr>
<tr>
<td>3- Column</td>
</tr>
<tr>
<td>4- Mounting bolt</td>
</tr>
</tbody>
</table>

4. Back off the jackscrews so the drive is supported only by the shims. Recheck the level of the drive by rotating the arm to the level marks. Adjust as necessary until the drive is within specified level tolerance.

5. Tighten the drive mounting bolts. Make sure that no jackscrews are supporting the drive.
1. **CHECK** the cage for plumb with a surveyor's instrument.

   Note: Checking and adjustment must be done when the steel is a uniform temperature, such as early morning or an overcast day.

2. To adjust for plumb, release the nuts and bolts (5) and jam nuts (8), then turn the adjusting nuts (6) to correct for plumb. Lower the side of the cage to bring it into plumb, do not attempt to raise the cage with the nuts.

---

**Figure 10**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Top Of Influent Column</td>
</tr>
<tr>
<td>2-</td>
<td>Rake Drive</td>
</tr>
<tr>
<td>3-</td>
<td>Drive Platform Or Upper Drive</td>
</tr>
<tr>
<td>4-</td>
<td>Shim As Required For A Tight Fit</td>
</tr>
<tr>
<td>5-</td>
<td>Bolt, Nut And Washer</td>
</tr>
<tr>
<td>6-</td>
<td>Adjusting Bolt (Capscrew)</td>
</tr>
<tr>
<td>7-</td>
<td>Adjusting Nut</td>
</tr>
<tr>
<td>8-</td>
<td>Jam Nut</td>
</tr>
<tr>
<td>9-</td>
<td>Cage (Reference)</td>
</tr>
</tbody>
</table>
3. Shim (4) if necessary between the drive and cage for a tight fit and for cage centering around the drive (shims not by Baker Process).

4. CHECK the cage for centering around the drive.

5. Secure the jam nuts (8) on the take-up bolts when the cage is plumb.

1. Adjust the feedwell supports for level within the same plane, referring to the General Erection Drawing.

2. **CHECK** the supports for a uniform elevation at the outer feedwell connection points. Adjust, if necessary. Tack weld and verify this condition. Refer to the General Erection Details Feedwell Support Stiffener Drawing.

3. Weld the feedwell supports as specified. Weld the bar to the top and bottom flange on the feedwell support. Refer to the General Erection Details Feedwell Support Stiffener Drawing.

**WELDING WARNING:** When welding on the feedwell do not use the walkway, platform or influent column as a ground and vice versa. This will damage the drive unit bearings due to electrical circuit contact.

4. Set the dispersion well supports in place between the feedwell supports and dispersion well.

5. Weld the dispersion well channel supports to the feedwell supports and dispersion well as indicated on the General Erection Drawing. Refer to the **WELDING WARNING**.

6. The feedwell may be installed one of two ways: (A) assembled in place on the feedwell supports, or (B) assembled in the tank bottom and raised into position and connected to the feedwell supports.

   (A) Assembled in place

   a. Install the feedwell sections one at a time, using the feedwell support brackets and fasteners specified, following a circle and supporting the installed sections with shoring. Orient the pieces as shown on the drawing. Refer to the "Lifting Procedures" on a following page.

   b. Adjust for alignment of the sections and upper rim when the sections are bolted together.

   c. Field locate and install the scum port baffles as shown on the drawings.

   (B) Assembled in the tank bottom

   a. Remove the rake arms temporarily, taking care to prevent damage to either the rake arms or cage.

   b. Assemble the feedwell around the cage, on the tank bottom. Orient the pieces as shown on the drawing. Refer to the "Lifting Procedures" on a following page.
c. Adjust for alignment of the sections and upper rim when the sections are bolted together.

d. Field locate and install the scum port baffles as shown on the drawings.

e. Raise the feedwell evenly into position, using multi-point lifting, and connect it to the feedwell supports using the feedwell support brackets and fasteners specified. Make sure the feedwell is oriented correctly.

(C) Lifting Procedures

When lifting the feedwell sections, care must be taken to prevent changing the radius (curve) of the sections. Lift the feedwell sections as follows:

a. If separate lifting lugs are provided, mount them to the predrilled holes located just below the rim angle at approximately ¼+ the total length of the feedwell section from each end of the section. Refer to Figure 11 (lifting rigid sections).

![Figure 11](image)

<table>
<thead>
<tr>
<th>Figure 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting Lug (if furnished)</td>
</tr>
<tr>
<td>Lifting Cables or Chains</td>
</tr>
</tbody>
</table>
If lifting lugs are not provided, attach the lifting cables or chains with lifting clamps to the feedwell section at the rim angle at this same distance (¼+) from each end of the feedwell section.

**CAUTION:** Do not attach the lifting cables or chains to the ends of the feedwell section. This will cause bending of the rim angle and feedwell plate, changing the radius and preventing proper fit-up of the sections.

b. When lifting large, less rigid, feedwell sections, a spreader beam (shown in Figure 12) should be used to provide a vertical lift.

![Figure 12](image_url)

<table>
<thead>
<tr>
<th></th>
<th>Figure 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Spreader Beam</td>
</tr>
<tr>
<td>2-</td>
<td>Lifting Cables or chains</td>
</tr>
<tr>
<td>3-</td>
<td>Lifting Lug (if furnished)</td>
</tr>
<tr>
<td>4-</td>
<td>Feedwell Section</td>
</tr>
</tbody>
</table>
c. Remove the lifting lugs, if used, after the feedwell section is in place. The mounting holes for the lifting lugs may be closed, if desired, using round headed bolts and nuts (the bolt heads must be on the outside of the feedwell), or by plug welding and grinding (not by Baker Process) for a smooth surface (both sides).

Note: Leaving the holes open will not affect the process performance of this equipment.

7. **CHECK** the feedwell for elevation and all around level. Adjust if necessary.

Note: The bottom of the scum outlet opening should not be higher than the bottom of the weir V-notch.

8. Adjust the scum port baffles for the specified opening (angle) and secure the mounting bolts.
1. Check the walkway for shop provided camber. If the walkway is not cambered, notify your Baker Process Representative immediately.

2. Mount the walkway in place on the tank (8) and drive. Do not force the connection. If necessary, elongate the mounting holes on the tank end of the walkway section. Secure the anchor fasteners at the drive end and tighten the nuts (3 and 4) together on the tank end, leaving a gap, as shown in Figure 13.

![Figure 13](image)

<table>
<thead>
<tr>
<th></th>
<th>Walkway</th>
<th>3- Jam nut</th>
<th>5- Tank Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-</td>
<td>Anchor bolts</td>
<td>4- Nut</td>
<td>6- 1/16&quot; clearance torque tighten nuts together for this clearance</td>
</tr>
</tbody>
</table>

The 1/16" (approximately) clearance between the walkway and nuts, shown in Figure 13, allows for contraction and expansion of the walkway during temperature changes.

3. Install the platform braces and spacer bars with the spacer bars under the braces. Bolt the braces to the drive.

4. Mount the platform in place on the platform braces, and bolt it to the braces and walkway.

5. Remove the drive oil fill pipe plug from the drive cover and install the pipe nipple and coupling specified. Reinstall the pipe plug in the top of this assembly.

7. Install the grating, handrail and nameplate as indicated on a following page.
Note: As specified, use Bi-Metallic adhesive backed neoprene tape at all aluminum to steel connections to protect components from galvanic action.
GRATING

1. Install the grating for the walkway and drive platform, referring to the part numbers, reference drawings and, if used, match marks. Refer to the Grating Clip Assembly Drawing.

2. Make sure the grating clears the drive unit components and fits together without any dangerous gaps or openings. It must fit flush without sharp corners or edges and it must be secure.

3. When dissimilar materials are used for the walkway superstructure and the grating, the surfaces must be separated by material that prevents galvanic action. Baker Process recommends a Bi-Metallic adhesive backed neoprene tape for all aluminum to steel connections.

HANDRAIL

1. Install the handrail as shown on the reference drawings. It must be plumb, square and level. It must be anchored securely and all edges and corners must be smooth.

2. When dissimilar materials are used for the handrail and mounting surface, a separation material must be used as covered in item #3, above.

NAMEPLATE

Install the Baker Process nameplate as shown on the reference drawings.
Figure 14

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Walkway</td>
</tr>
<tr>
<td>2-</td>
<td>1/4&quot; (6.4mm) Between Panels</td>
</tr>
<tr>
<td>3-</td>
<td>Bolt and Nut</td>
</tr>
</tbody>
</table>
LUBRICATION WARNING

The drive is shipped from the factory without lubricating oil and/or grease.

Prior to being operated, the drive, including all accessory equipment components, must be lubricated, referring to both the Baker Process "Lubrication" Instructions and the accessory equipment Manufacturer's Instructions included in this manual (if furnished by Baker Process). Refer to the Table Of Contents for page numbers of the Drive Lubrication Instructions and the accessory equipment Manufacturer's Instructions.

GEARMOTOR CAUTION

The gearmotor has been selected for the specified torque and output speed required for this mechanism. Neither the gearmotor's power, nor output speed should be changed without consulting Baker Process for engineering evaluation and comments.

CONNECT ELECTRICAL WIRING

Refer to the drawings for connection of the wiring to the drive motor, drive control, and, as furnished, alarm, control panel, torque recorder, etc. Baker Process does not furnish, locate or install the interconnecting wiring, control panels, etc. All interconnecting wiring must meet local electrical codes.

Note: An appropriate fitting and drain (not by Baker Process) must be used at the wiring (conduit) connection to the drive control to eliminate water condensation. The fitting and drain must comply with National Electrical Codes (N.E.C.) specifications.

Note that the drive motor must be wired so an automatic restarting of the motor cannot occur after a drive control shutdown, following a torque load.

CAUTION WHEN NO POWER IS AVAILABLE

To rotate the rake arms for final leveling when no electricity is available, observe the following WARNINGS:

a. Direction of rotation - The worm shaft (driven sprocket) must be turned the direction of the rotation "arrow" on the cover guard and the rake arms must turn clockwise, when viewed from above. (It is necessary to ensure warranty coverage.) An air ratchet or hand crank can be used to turn the shaft, but it should be protected against damage.

b. Torque build up - Watch the drive control arrow, during the rotation, to make sure it does not go above zero "0". If it does, immediately stop the rotation and refer to the "Drive Maintenance Warning" in the Maintenance Section.
CHECK DRIVE ROTATION

The gearmotor must be connected for the direction of rotation specified on the drawing and shown by the arrow on the chain guard. If it is not, that will void the drive warranty and Baker Process will not pay for damage.

CHECK the gearmotor for direction of rotation without the drive chain installed. Refer to the directional "arrow" on the chain guard or the Reference Drawing. Reinstall the chain.

CHECK ALIGNMENT OF A FIELD INSTALLED MOTOR DRIVE

If the gearmotor was shipped separately from the main drive, install and align the sprockets as follows:

Set the driven sprocket on the worm shaft outward 5/16" (7.9 mm) from true alignment (with the drive sprocket). This is necessary since the worm shaft will move inward 5/8" (15.9 mm) under maximum running load. So this initial 5/16" (7.9 mm) setting will be closer to true alignment with the displacement that occurs under normal load.

Adjust the chain for tension, referring to the instructions under Drive Maintenance.

CHECK THE DRIVE CONTROL FOR OPERATION

Refer to the parts list for the switch settings in checking the drive control. (Electricity is required for this check.)

a. Start the drive motor. (Check the tank for obstructions or do this check while the chain is removed.)

b. Remove the cylindrical switch housing, unscrewing it from the base. Then manually actuate the cam switches by turning the camshaft (and pointer) with the set collar (end of camshaft). Slowly turn the pointer through a complete range to 100. This will simulate a mechanism full load condition. At the set points the alarm should sound and the drive motor should stop.

c. If the drive control does not react correctly, check each switch individually. If none of the cam switches actuate, recheck the wiring to the drive control. Refer to the Wiring Diagrams. If the wiring is correct, check the cams for proper setting and the camshaft for alignment. Contact your Baker Process Representative in case of a problem.

d. Replace the switch housing cover, being sure it goes on straight to avoid cross threading and to ensure a tight seal. Tighten the cover a minimum 1/2 turn after contacting the O-ring.
**DRIVE CONTROL CAUTION:** The drive control is an overload cut out device to protect the drive. Since it is installed and adjusted at the factory for proper operation, do not tamper with it. If the original cam settings are not satisfactory for the conditions, contact your Baker Process Representative before attempting any adjustments. And the motor must not be able to restart automatically after a torque overload; see Electrical Wiring, above.

**WARNING:** If the drive unit stops due to an overload, do not attempt to restart it until the cause of the overload has been located and corrected. Refer to the "Drive Maintenance **WARNING**" Instructions in this manual.
CHECK THE ARMS FOR EQUAL CLEARANCE WITH THE TANK BOTTOM

The arms will be checked at this time for equal clearance with the tank bottom. It is not necessary, at this time, that the arms are set at the specified elevation, but all arms must sweep in the same plane.

1. **CHECK** the arms for equal setting or clearance with the tank bottom, using a reference device on the tank bottom, such as piles of sand.

2. Adjust the arms for equal sweep by rotating the arms over the reference device and adjusting them as necessary for the same alignment.

When adjusting one arm, always support the opposite arm with blocking. Use jacks to lift the arms; do not attempt to lift them any other way.
MECHANICAL CHECK

At this stage in the erection or installation of the equipment, before the influent column or tank is grouted, a field mechanical check of the equipment by a Baker Process Representative may be advisable. It could prevent expensive, difficult adjustments later.

Be aware, however, that this may be an additional paid service call, since a final mechanical check is required to ensure warranty coverage.

CALL YOUR SERVICE REPRESENTATIVE

Discuss this with your Baker Process Service Representative, who is experienced with this particular equipment and who will help you decide if a check should be made now, as well as later. Call your Baker Process Representative referring to the Offices page at the end of this manual.

Arrangements for a service call must be made at least two weeks in advance.
1. A temporary dam (3) should be constructed around the influent opening to hold back the grout during the grouting of the column, if not already constructed.

2. Grout under the column (1) using a non-shrinking type grout (2). Pack the grout by tamping. (Grout not by Baker Process.)

Figure 15

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1-</td>
<td>Column</td>
<td>2-</td>
</tr>
<tr>
<td>3-</td>
<td>Temporary dam</td>
<td></td>
</tr>
</tbody>
</table>
GROUTING RESPONSIBILITY

Baker Process is not responsible for grouting the tank, grouting specifications of material, depth or accuracy of placement. Grouting specifications and final approval of the grouted tank are solely the responsibility of the user, or his agent.

This suggested procedure is offered only as a guide to assist those responsible for grouting.

PURPOSE OF GROUTING

Grout is added to a tank bottom to provide a bottom surface with controlled contour variation. Such variation, if not specified on contract documents, is usually intended to be ± 1/4" (6.4 mm), and allows setting rake arm blades, via adjustable squeegees, 0 to 1/2" (12.7 mm). Clearance of the adjusted squeegee to local low spots may be allowed up to 3/4" (19.1 mm). The clearances provided herein do not supersede contract documents governing equipment installation.

DETERMINE GROUT ELEVATION

Refer to the reference drawing for the specified elevation of grout. Then, using a surveyor's instrument, mark the elevation on bolts or posts secured to the tank bottom radially from center of the tank, referring to Figure 16.

![Figure 16](image_url)

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Centerline of Tank</td>
</tr>
<tr>
<td>2-</td>
<td>Tank Wall</td>
</tr>
<tr>
<td>3-</td>
<td>Slope as specified</td>
</tr>
<tr>
<td>4-</td>
<td>Reference Line</td>
</tr>
</tbody>
</table>
String a reference line or wire between the posts or bolts, set for the surveyed elevation. This line will be used to set the screed boards for correct grout elevation and slope.

**HEAT DISTORTION**

Heat distortion, by the sun, can cause the column and arms to distort unevenly during screed board construction or grouting, which will cause an unevenly grouted tank bottom.

Heat distortion of the column can be controlled by mounting sheets of cardboard, styrofoam, etc. to the sides of the cage, or by grouting in the early morning or on an overcast day.

On mechanisms over 50’ (15.2 mm) dia., heat distortion of the arms can also be a problem. It can be controlled by grouting in the late afternoon or on an overcast day, or by covering the arms. But, if the tank must be grouted during the hot part of the day and the arms are not covered, the amount of distortion should be considered.

1. During the early morning hours measure the distance from the bottom of the arm to the tank bottom at the outer end of the arm.

2. Next, during the hottest part of the day, again measure the clearance between the arm and tank bottom at the same point measured in early morning.

3. The difference between these two measurements (1 and 2 above) is the amount of heat distortion that must be considered during grouting. Remember that the arms will distort downward at the tips; so, for example, if grouting is started in early morning and it runs into noon, the outer tips of the arms will sag and cut into the outer circle of grout. For that reason it would be better to start in the afternoon.

   **Note:** During operation, heat distortion is not a problem as both the arms and columns are under water and equal temperature.

**SCREED BOARD CONSTRUCTION**

1. Bolt 2 x 4 boards to each steel blade on both rake arms with the boards extending about 2” (50.8 mm) in front of the blades, as shown in Figure 17. At the leading edges of the boards, cut the ends parallel with the arm so that the screed board will run parallel to the arm when it is nailed to the boards. Round off the lower edges of the screed board.

2. Nail a strip of bent sheet metal across the bottom of the 2 x 6 board that will be used for the screed, as shown in Figure 16. Note that the sheet metal for the screeding surface on the bottom must be straight and smooth. Nail only to the sides of the boards.
Figure 17
### Table

| Figure 17 |  |
|-----------|--|---|
| 1.- Direction of travel                  | 14.- For slope of tank bottom. See General Arrangement drawing |
| 2.- Centerline of tank                    | 15.- Bottom of screed board. Do not nail here |
| 3.- Arm                                      | 16.- 2 X 4 |
| 4.- Blade                                      | 17.- 2 X 6 |
| 5.- Extra braces if necessary                | 18.- View "A-A" |
| 6.- Trough or flat at center of tank    | 19.- Bolts |
| 7.- Alternate method at center: screed board on radial line if possible. or see #9 | 20.- Rake Arms |
| 8.- End of screed board should come as close as possible to tank wall. Check through complete rotation. | 21.- View "B-B" |
| 9.- Use saw cuts to bend screed board at inner end to follow curvature of tank bottom | 22.- Bolts thru squeegee mounting holes |
| 10.- Tank wall                             | 23.- Detail "A" |
| 11.- Bottom of arm                         | 24.- Direction of rotation |
| 12.- Tank bottom before grouting           | 25.- Bent sheet metal nailed to 2 X 6 |
| 13.- Reference line and bottom of screed board |  |

3. Nail the 2 x 6 screed board to the ends of the 2 x 4 boards. The bottom of the screed board must just touch and run parallel with the reference line. At no point should the grout thickness be less than 1 inch to avoid cracking. (Take note of "Heat Distortion" above.)

**Note:** When two rake arms are used for grouting, place piles of sand under the screeds of the first arm, then level the screeds on the second arm according to the heights of the sand piles. This is to ensure that all corresponding screeds are of equal height.

4. A diagonal or bent inner screed board may be required to grout the center of the tank, or it may be grouted by hand. Be sure a constant depth of grout not less than 1" (25.4 mm) is maintained.

Prepare a form around the drain pocket, as required, to keep out the grout.
SUGGESTED GROUTING PROCEDURE

**WARNING:** The drive control (torque indicator) must be connected before starting the grouting. This is a protective device for the drive unit and mechanism. Bypassing it will void the warranty.

1. Usually, grout of the following proportions will be satisfactory: 3 parts sand by weight, 1 part cement by weight and clear water, enough to permit reasonable slump for ease of equipment distribution (about the consistency of mortar). Do Not use gravel.

2. Start two rings of grout (one for each arm) which can be worked by a crew, usually 2’ (0.6 m) wide, at the outer edge of the tank. These rings can be gradually widened as they approach the center of the tank. The grout should not be allowed to build up in front of the screed.

Continue the outer ring in a spiraling pattern, working towards the center of the tank. Cement finishers should work just ahead of the screed arms to be certain the grout is proper thickness to cover the area and to prevent excessive loads accumulating in front of the screed board. Also, wet down the concrete floor ahead of the grout to ensure a good bond.

When a load of grout is placed in front of a moving arm, it should be wide enough for the cement finishers to work it at the rate of arm travel. Never stand or put weight on an arm during grouting.

Do not stop the mechanism once grouting has started. Restarting will result in screed jerking and digging in the grout. If an area to be grouted must be missed, return to it later. Do not wait.

3. When grouting is complete, rotate the mechanism 2 to 3 times to pick up any grout that may have sloughed toward the center. If sloughing occurs, it will be necessary to remove the excess and fill in the low areas with fresh grout. Watch for rocks or dried pieces of grout during this procedure, which may catch under the screeds and gouge the surface. The cement finishers working from the arms can fill in the ungrouted area at the center of the tank.

Careful grouting should produce a finished bottom that is uniform within a ± 1/4” (6.4 mm) of the specified depth.

4. Remove the screeds after the grout has dried.
1. Place temporary blocking under the rake arms for support.

2. Mount the vertical skimmer support to the rake arm using the clamps, as shown on the drawings. Do not weld at this time.

3. Mount the counterbalance box on the arm opposite from the skimming device. Refer to the **WELDING WARNING** below.

**WELDING WARNING:** Use the piece being welded as the ground to prevent the electrical circuit passing through the drive.

4. Adjust the skimmer support for position on the rake arm referring to the Skimming Mechanism Erection Drawing for dimensions. Adjust the skimmer support for plumb, shimming as required (shims not by Baker Process). Then secure the clamps.

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<table>
<thead>
<tr>
<th></th>
<th>Figure 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Skimmer arm assembly</td>
</tr>
<tr>
<td>2-</td>
<td>Weld</td>
</tr>
<tr>
<td>3-</td>
<td>Vertical Skimmer Support</td>
</tr>
<tr>
<td>4-</td>
<td>Rake Arm</td>
</tr>
<tr>
<td>9-</td>
<td>Tank Wall</td>
</tr>
<tr>
<td>10-</td>
<td>Dimensions as shown</td>
</tr>
<tr>
<td>11-</td>
<td>Clamp</td>
</tr>
</tbody>
</table>

*The distance from the scum box to the skimmer (dimension*) is approximately 4" (101.6 mm) ±.
5. Mount the skimming device parts to the skimmer arm referring to the assembly drawings.

6. Mount the skimmer arm assembly (with skimmer device) to the vertical skimmer support using the channel clamps and U-bolt. The skimmer arm must be parallel to the rake arm centerline. Position the skimming device on the arm so the end wiper is just touching the baffles and so that the bottom wiper is approximately 3" (76.2 mm) below water level.

![Diagram of skimming device](image)
7. Weld the skimmer support and clamps to the rake arm, as specified on the drawings. Field locate and install the skimmer support brace, welding as specified. Observe the WELDING WARNING.

8. Adjust the skimmer arm for level, and elevation if necessary, using the U-bolt. Adjust the skimmer arm alignment, as required, to align the scum skimmer parallel to the scum box discharge leading drop edge, as shown in Figure 19. Then weld the skimmer arm to the vertical support.

9. Install and tension the springs as specified on the Skimming Device Assembly.

10. CHECK the rake arms for final level before the skimmer blade is installed. Refer to the Rake Arm Final Adjustment Instructions.

Figure 20

<table>
<thead>
<tr>
<th>Figure 20</th>
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</thead>
<tbody>
<tr>
<td>1-</td>
</tr>
<tr>
<td>Feedwell</td>
</tr>
<tr>
<td>2-</td>
</tr>
<tr>
<td>Skimmer blade will be tangent at this point</td>
</tr>
<tr>
<td>3-</td>
</tr>
<tr>
<td>Skimmer Arm</td>
</tr>
</tbody>
</table>
11. Install the skimmer blade referring to the Erection Drawings and Figure 21. Adjust the skimmer blade for level at the elevation specified and for allowable contact at the feedwell connection angle. If necessary, trim the blade where it extends past the feedwell connection. Weld, as specified, referring to the WELDING WARNING.

   Note: At this point in the skimmer erection, further adjustment to the skimmer arm is no longer possible.

12. Refer to the Skimmer Arm Assembly Maintenance and Adjustment Instructions for Final Adjustment and Maintenance Procedures.
The purpose of this adjustment is to ensure that all arms have proper and equal clearance with the tank bottom so that each arm is loaded equally, thus preventing unbalanced loading on the mechanism.

This adjustment must follow final leveling of the drive unit.

CAUTION: Checking and leveling must be done when the steel is at a uniform temperature such as the early morning or an overcast day.

1. CHECK the arms or blades for clearance with the tank bottom around the center of the mechanism, as specified on the drawings. Raising or lowering the cage by means of the take-up studs and slotted connector between the drive and cage makes vertical adjustments. Use jacks under the cage to raise or lower it for adjustments. After adjustments are made, recheck the cage for plumb.

2. CHECK that the arms or blades sweep at the clearance specified with the tank bottom and in the same plane. Checking is done by means of reference devices on the tank bottom such as a pile(s) of sand. Adjust or mark the device for the clearance of the arms from the tank floor specified.

3. Rotate each arm to the place of the checking device and adjust the arm for the required clearance. Use a jack to lift the arms to assist in this adjustment. Add or remove shims equally at both connections as necessary to achieve equal arm level. Block under the opposite arm before the arm being adjusted is raised or lowered.

4. Secure all arm connections. Install the cage corner braces. Recheck alignment.
1. After the tank has been grouted, install the squeegees, referring to the part numbers on the drawing. The squeegees must be installed on the side of the blade facing the direction of arm rotation, as shown in the illustration below.

2. Adjust each squeegee for minimum clearance with the bottom of the tank. Clearance of the squeegee from the grouted bottom will be from 0 (touching at the highest point in the sweep of the arm) to \( \frac{1}{8} \)" (12.7 mm), with possible \( \frac{3}{4} \)" (19.1 mm) clearance at a few local low spots. This will be possible if grouting was done properly.

3. **CHECK** squeegee clearance around the tank by rotating the arms.

---

**Figure 21**

<table>
<thead>
<tr>
<th>Figure 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Clearance</td>
</tr>
<tr>
<td>2- Blade</td>
</tr>
<tr>
<td>3- Squeegee</td>
</tr>
</tbody>
</table>
FINAL MECHANICAL CHECK

At the completion of erection or installation of the equipment, a Baker Process Service Representative must complete a final field mechanical check of the equipment. Unless accepted and signed-off by the Service Representative at the completion, the warranty will not be in effect.

Previous inspections will not count towards final acceptance unless a sign-off is obtained, in writing, from the Service Representative. Also, depending on any previous inspections, this final check may be an additional paid service call.

ARRANGEMENTS FOR SERVICE

The "Final Mechanical Check List", included at the back of this manual, must be completed for each mechanism furnished before contacting your Baker Process representative to arrange for the final field mechanical check.

Arrangements for field mechanical check should be made at least two weeks in advance with your Baker Process Representative. Refer to the Offices page to contact him.

DO NOT FILL THE TANK WITH WATER

The mechanical check cannot be done if the tank is filled with water. If the check cannot be performed, an additional paid service day will be charged.
Refer to the "Torque Test Instructions" drawing for test procedures.

**WARNING:** For the protection of personnel during the torque test, the following precautions must be taken:

1. Anyone entering the area of this equipment must be wearing adequate safety equipment such as safety glasses, safety shoes, hard hat, etc.

2. **CHECK** the torque test kit before use to be sure the cable slings and other components are in good condition.

3. Make sure the cinch anchors (not by Baker Process) used to anchor the test equipment are specified size and properly installed.

4. Limit the number of personnel inside the tank to that necessary to perform the test.

5. Stay away from the rake arms while the test is in progress. Do Not stand in front of the leading side of the arm(s) while they are under tension during the test.

6. Do not exceed the maximum indicated load (read on the linear scale) specified on the "Torque Test Instructions" Drawing.

7. Anyone who will be entering the area of this equipment during the torque test must be informed of these precautions prior to starting the test.
PURPOSE

The Clarifier is installed for the purpose of continuously removing substantially all settleable solids from a flow of water, sewage, or trade waste.

For water treatment, the mechanism is installed in clarification and softening plants to remove precipitates after chemical treatment and before sand filtration. It is also used for presedimentation of turbid or muddy water.

In sewage treatment, the uses for the mechanism vary considerably, depending upon the type of plant and its location in the plant’s flow sheet. It may be used for sedimentation of raw sewage after coarse or fine screening, shredding or grit removal, for sedimentation of activated sludge after aeration, or for settling out the humus in the effluent of trickling filters.

In trade waste treatment so much variation is found that specific use cannot be tabulated. However, in every case, operation will be sufficiently similar to that of clarifiers on sewage or water to enable general usage of these instructions.

DESIGN FEATURES

Influent and Effluent

The feed (influent) enters the center of the tank through the influent column. Refer to the Gencral Arrangement Drawing for further details. As the feed enters the tank below the water surface, it flows outward into a dispersion well and then into a circular outer feedwell. When the feed discharges from the dispersion well into the feedwell, its entering velocity is dissipated by means of adjustable dispersion gates around the dispersion well, causing the feed to take a downward direction into and from the feedwell. From the feedwell, the feed flows down towards the bottom of the tank where the solids settle out or float to the surface, and the clear water then flows out radially towards the peripheral overflow weir and effluent launder (not by Baker Process).

The dispersion gates are adjustable for different flows in order to breakup the flow for the best diffusion.

The effluent flows over a weir, which ordinarily extends around the entire periphery of the clarifier. Flow through the clarifier is of sufficient detention time to allow the solids in the feed to settle during the time of passage from the influent to the effluent weir.

The effluent weir must, therefore, be level in order to discharge a steady and uniform amount of liquid. Any irregularity in weir level will cause a convergence of flow at low points and the velocity at the low points will be enough to carry fine solids over the weir at that point. Most clarifiers, and especially the large-diameter clarifiers, use saw-toothed weirs in order to overcome the effect of wind, which would cause flow to the downwind side of the tank if the weir were flat.
The effluent channel may sometimes slope toward the outlet or outlets, but in any case is of sufficient capacity to enable flow to the point of outlet from the channel without flooding or submerging the weirs.

**Scum Baffles**

The clarifier is provided with scum baffles that are located parallel to and about 8" away from the weirs to prevent scum from overflowing the weirs into the effluent channel.

Integral with the scum baffle is a scum box that receives and discharges accumulated scum as it is moved from the center of the tank to the periphery by means of a scum skimmer and scum scraper. This scum box must be level and adjusted in height in accordance with the erection instructions.

The scum-skimming device is designed for long service life with a minimum of maintenance. No lubrication is required. Periodically the condition of the wipers on the skimming device should be checked to make certain they are effectively contacting the scum box and baffle surfaces in order to properly contain the scum material for discharge into the scum box. The scum-skimming device must also be leveled in accordance with the erection instructions.

**Raking Mechanism**

The raking mechanism at the tank bottom collects the solids as they settle. The rake blades with replaceable squeegees roll and concentrate the solids during their travel to the center of the clarifier. The speed of the raking mechanism has been set for the indicated purpose of the particular machine and should not be changed without consulting Baker Process.

The rake arms are supported and driven by a center drive unit by way of a cage that connects to the drive main gear. Refer to the instructions on General Drive Maintenance Instructions for further details.

**STARTING OPERATION**

It is assumed that the mechanism has been lubricated, all parts are in alignment, and proper clearance exists between the rake arm squeegees and the tank bottom throughout a complete revolution of the mechanism. The squeegees are furnished for scraping the tank bottom to prevent septic action of sludge and so a minimum clearance is required during a complete revolution of the arms, as specified in the erection instructions.

The mechanism should be rotated in the empty tank at least 4 or 5 times before any feed is allowed to enter the tank. Any discrepancies or problems should be noted and corrected before start up, referring to the Mechanical Pre-start-up Check Instructions.
After operating the mechanism in the empty tank, start the feed into the tank. When the water in the tank is up to the bottom of the rake arms, start the clarifier and allow the tank to fill while the mechanism continues to operate.

At first, withdraw the sludge at frequent intervals until a definite schedule for removal can be made. The sludge removal schedule should call for withdrawal at least twice every twenty-four (24) hours. Do not try to discharge the sludge too thick, as this may overload the mechanism, cause septic action, or result in clogged piping or pumps (not by Baker Process).

A depth of sludge of 12" to 24" over the point of discharge in the drain pocket (not by Baker Process) should be kept at all times, depending upon the size of the clarifier. This sludge will form a seal over the discharge and sludge outlet pipe and ensure removal of uniform sludge with as high a solids concentration as possible.

**NORMAL OPERATION**

The clarifier mechanism should operate continuously to keep the sludge in constant motion towards the drain pocket (not by Baker Process).

The sludge should be removed from the clarifier several times daily, as stated above, to prevent the accumulation of heavy rake loads and the flotation of sludge (sometimes septic sludge).

A regular schedule of pumping should be determined by experience and strictly followed. The quantity of grit in the incoming flow is very important; if it is present in appreciable quantities, more frequent intervals of pumping will be necessary. If grit is present in large quantities, some provision for its removal should be made prior to its entering the clarifier. Its removal from the clarifier with sludge will cause inevitable deposits in digesters, if used, necessitating their shutdown and cleaning.

**OPERATING PROBLEMS AND CORRECTIONS**

1. **Foreign Objects in Tank**

   To minimize damage resulting from objects such as tools, rocks, rags and other foreign bodies being dropped into the tank, it is imperative that the feed and mechanism be stopped and these objects removed immediately before continuing operation.

2. **Discharge Line Becomes Plugged**

   If sludge is allowed to become too thick, it may plug the discharge line (not by Baker Process), or foreign material may get into the line and cause the plugging. To correct this, turn high-pressure water back through the underflow line until the line is cleared.
3. Higher Than Normal Torque on the Drive Control

Sludge may gradually accumulate in the tank over a period of time due to the sludge being discharged at a rate less than the rate of solids entering with the feed. This will be noticed by a higher than normal operating torque. It will be necessary to increase the rate or frequency of withdrawal in order to bring the sludge down to appropriate operating level.

If a very gradual increase in the torque load is noted, it is possible that grit or silt is being introduced with the influent. If this material cannot be removed normally through the tank drain, it will gradually overload the mechanism. In any case, the drive should not be allowed to operate continuously for days at a high torque (over 20%), even though the alarm does not sound. It will be necessary to remove the silt by shutting off the feed, rotating the arms and intermittently withdrawing the silt. Usually, however, grit and silt are removed from the influent before it can reach the Clarifier and this kind of problem is unlikely to occur.

4. Overload Alarm Sounds or Motor Stops

If the sludge load becomes so heavy that torque build-up occurs in the machine and the drive control indicates a load sufficient to actuate the alarm, the operator will then be alerted that something is causing an overload on the mechanism. The feed should be stopped immediately and the solids withdrawn to normal level. (The operator should not allow the torque to reach this point before taking corrective action, however.)

If the overload is allowed to increase, the drive control will cut electrical power and stop the mechanism. When this occurs, it will be necessary to drain the tank and physically remove the sludge from the tank.

If a foreign object has been dropped into the tank accidentally, the mechanism may suddenly overload, sound the alarm and then stop. In this case, the object must be removed. It will be necessary to bypass the feed until the obstruction can be located, and it might be necessary to drain the tank.

5. Solids in the Effluent and Overloading

If the solids rise to the surface and overflow with the effluent, any number of problems may be at fault and each should be investigated individually.

The clarifier may be overloaded either by too great a volume of water or by too many solids in the feed, or by a combination of both.
Too much volume, due to storm water for example, may increase the flow above design capacity of the clarifier causing sludge particles to wash over with the effluent rather than settle out. This also reduces the sludge level in the tank adversely affecting the solids concentration. When there is excessive flow some of the flow should be bypassed if possible. Too many solids in the overflow may be caused simply by an overload of the treatment plant and too many solids for the clarifier to handle. Only additional treatment units can correct this, over a period of time.

But too many solids in the effluent may be caused simply by inadequate solids withdrawal due to amount or frequency. The sludge pump, timing mechanisms or a plugged sludge pipe could be the cause. Temporary shutdown will be necessary.

An overload may also be the result of a single unusually large discharge of solids into the plant, but this must be corrected at the source. Temporary relief may be obtained by storage, if possible, or bypassing to other units or areas.

6. Poorly Settling Sludge

Solids in the effluent may also be the result of a poorly settling sludge or other sludge problems.

In a low solids condition, inadequate flocculation may occur somewhere in the system and the solids will be dispersed and fail to settle. Temporarily reducing the sludge withdrawal, additional flocculation upstream or adjustment of the dispersion well gates to reduce the turbulence will help control this situation. In some cases, flocculants may be added to develop the bulk and weight for the solids to settle.

Growths of certain organisms may also cause the sludge to swell, but they themselves do not flocculate. Since there are various conditions and solutions involving pH, temperature, low oxygen, etc., consult your Baker Process Representative.

Septic sludge on the tank bottom and a lack of oxygen will cause anaerobic decomposition to occur. If this happens, pieces of sludge will float to the tank surface accompanied by objectionable odor. The condition may be due to worn squeegees that are not sufficiently close to the tank bottom to scrape up the sludge, inadequate withdrawal of sludge, or too long of a retention time. Locate and correct the problem before the condition gets worse.
7. Surface Ice Or Heavy Surface Scum Loading

The skimming device assembly is not designed to push ice or other heavy floating items or accumulations. During icing or severe surface float conditions, lock the skimmer in position above the liquid level on top of the skimmer arm. To raise the skimmer assembly, lift the scum skimmer blade vertically (it will rotate on the arm clevises) above the skimmer arm. Then, move the blade horizontally toward the center of the tank, folding the scum skimmer blade and scraper arms down to a position on top of the skimmer arm and vertical hinged skimmer.

**CAUTION:** Make sure the skimming device rests securely in position. It must not be allowed to slip off to either side of the skimmer arm during operation of the clarifier.

**CAUTION:** Make sure the skimmer assembly does not contact the walkway superstructure or other stationary objects as it is rotated around the tank in this "out of service" condition.

**Note:** When the skimming device is placed back into operation, pull the vertical hinged skimmer out of the way before lowering the scum skimmer blade back into operating position. Then, check the skimming device for proper adjustment, referring to the Skimmer Maintenance Instructions.

**SHUTDOWN OF THE CLARIFIER**

Every effort should be made to correct operating problems without draining or dewatering the tank. The sludge pipe should be cleared, if possible, with a plumber's snake or by applying high-pressure water, and foreign objects should be fished out with hooks.

If draining the tank is necessary to correct problems or to recondition the mechanism, it should be done in the winter when biological growth would be the least, rather than in the warm weather of summer. It should also be planned so that down time is at a minimum and the flow into the plant is at its lowest point.

**OPERATING WARNINGS:**

Do not attempt to keep the clarifier running when an overload is indicated! Find the trouble and correct it! Do not tamper with the overload alarm switch adjustments in an effort to keep the mechanism running.

Do not start up with a load of sludge in the tank!
MAINTENANCE

Refer to the Maintenance Summary Instructions in a previous section.
The process performance of the equipment referred to in these instructions is dependent upon many factors, including influent or feed quality and quantity, additives required, time, temperature, rates of change, sizing criteria used, operating conditions, etc. Therefore, unless a written Process Performance Warranty has been included, Baker Process cannot assume any liability or responsibility for performance results that the user of the equipment is expecting or has predicted.

Should assistance be required in the operation of the equipment, due to unexpected conditions, or should accessory or add on components or changes be required to meet your performance needs, Baker Process can, at additional cost, provide the service of experts to assist you in determining what actions must be taken.
CHECK POINTS BEFORE START-UP

Note: The drive and mechanism must be level and checked by an authorized Baker Process Representative before start-up.

1. Remove any foreign matter from inside the tank. Remove any blocking or shoring used in the erection of the equipment.

2. **CHECK** the oil levels in the main drive. Refer to Lubrication Instructions. Check the motor drives referring to the Manufacturer’s Instructions.

3. Make sure the drive control was checked for proper operation referring to "The Drive Control" instructions under drive maintenance.

4. Make sure the drive platform and walkway are clean and free of oil, debris and tools. Make sure all drive cover guards are in place.

5. Rotate the arms for at least 4 or 5 revolutions. Make all observations from outside the tank.

   This procedure should be conducted when distortion from sunlight would be at a minimum, such as, early morning or an overcast day.

6. Watch for clearance of the rake arm blade squeegees with the tank bottom. Check for loose parts, bolts and nuts.

7. Watch the scum skimmer to be sure it is working efficiently and adjusted for smooth operation over the scum box. Check wipers and hinges for proper operation. Refer to the Skimming Device Maintenance and Adjustment Instructions.
CHECK DRIVE ROTATION

CHECK a new gear motor for direction of rotation before the drive chain is installed. Refer to the directional "arrow" on the drive cover, chain guard or Motor Drive Assembly Drawing for direction of rotation.

If the drive unit is not turning proper direction of rotation, the drive unit warranty will be void and Baker Process will not accept costs for drive damage.

CHECK DRIVE SPROCKET ALIGNMENT

Since the worm shaft will be displaced inward under load, the drive sprocket on the worm shaft should be offset 5/16" (7.9 mm) from true alignment, as shown in Figure 22. This initial setting, then, will allow for near true alignment with the displacement that occurs under normal running load. Adjust the chain for tension, as covered below. Refer to the Reference Drawing for correct setting of the driven sprocket.

![Diagram](image)

Figure 22

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1-</td>
<td>5/16&quot; (7.9 mm) offset at zero lead</td>
</tr>
<tr>
<td>2-</td>
<td>Drive Sprocket</td>
</tr>
<tr>
<td>3-</td>
<td>Gearmotor</td>
</tr>
<tr>
<td>4-</td>
<td>Driven Sprocket</td>
</tr>
<tr>
<td>5-</td>
<td>Worm Drive</td>
</tr>
</tbody>
</table>
CHECK CHAIN TENSION

Proper chain tension is essential for maximum drive and chain life, as well as for smooth and quiet operation of the drive. Chains that are too tight can damage drive motor/reducer bearings, or cause broken chains. Loose chains will clatter and can come off the sprockets.

1. Chains should be installed with only a small amount of slack. New chains will loosen up slightly as the joints seat themselves, causing initial elongation of the chain.

2. After several weeks of operation, chain tension should be rechecked, and adjusted as necessary.

3. Refer to the Lubrication Instructions for proper lubrication.

THE DRIVE UNIT

These drive units consist of a main gear on the bottom, which is the main driving unit for the rake arms, and a worm assembly on top that drives the main gear with a pinion.

The worm gear drive is designed with a worm shaft that moves axially under loaded conditions of the drive unit. This movement is made possible by a thrust bearing with a sliding bearing seat arrangement on the loaded side of the worm.

The sliding bearing seat is held in place by a spring, and the compression of that spring, when the drive is under load, indicates the torque on the drive unit. When the spring compresses, its movement is transmitted by the movement of the bearing seat against an actuating pin screwed into the drive control actuator pointer. (The spring is calibrated for load at the factory.)

THE DRIVE CONTROL

The drive control, which mounts to the worm housing, protects the drive unit and mechanism in case of overload, such as an excessive solids load on the rake arms.

Basically the drive control consists of the actuating pin in the actuator pointer, the scale, a camshaft and cams and switches. The actuating pin, which connects to the sliding bearing seat in the worm drive assembly, rotates the actuator pointer which rotates the cam shaft, as the sliding seat moves when load is applied to the mechanism.

The cams rotate with the camshaft and they actuate the switches at various load settings as they rotate. At the same time, the pointer shows the amount of torque on the drive on the scale, which is graduated, into percents from 0 to 100.
CHECK the Drive Control once a year for condition and operation, as follows below:

Note: In areas with wide variations in temperature, at first check the drive control once a month for condensation and for operation until a reasonable inspection frequency can be determined.

a. Start the gear motor drive.

b. Remove the cylindrical switch housing, unscrewing it from the base. Then manually actuate the cam switches by turning the camshaft (and pointer) with the set collar (end of camshaft). Slowly turn the pointer through a complete range to 100. This will simulate a mechanism full load condition. At the set points the alarm should sound and the drive motor should stop.

c. If the drive control does not react correctly, check each switch individually.

d. If none of the cam switches actuate, as stated above, recheck the wiring to the drive control (not by Baker Process). Refer to the Wiring Diagrams.

e. If the wiring is correct, check the cams for proper setting and check the actuation pin to be sure it is in position and not bent. Contact your Baker Process Representative if the problem cannot be determined.

f. Replace the switch housing cover, being sure it goes on straight to ensure a tight seal. Tighten the switch housing cover a minimum of ½ turn after contacting the O-ring.

**DRIVE CONTROL CAUTION:** The drive control is the overload cut-out device for the drive. Since it is installed and adjusted at the factory for proper operation, do not tamper with it. If the original cam settings are not considered satisfactory for the operating conditions, contact your Baker Process Representative before attempting any adjustment.

**WARNING:** If the drive unit stops due to an overload do not attempt to restart the unit until the cause of the overload has been located and corrected. Refer to the "Drive Maintenance WARNING" Instruction in this manual.

**ELECTRICAL EQUIPMENT AND ENCLOSURES**

Electrical enclosures for the gearmotor, control panels, etc. are listed on the drawings and Baker Process parts list, if Baker Process furnishes those items.
If any electrical equipment, including gearmotors, is to be replaced, it must be of equal or better rating. Refer to the latest edition of the NEMA ICS (National Electrical Manufacturer’s Association Industrial Control Standards) and NEMA MG 1 (N.E.M.A. Motors and Generators) for a description of those enclosure designations.

The gearmotor has been selected for the specified torque and output speed required for this mechanism. Neither the gearmotor’s power, nor output speed, should be changed without consulting Baker Process for engineering evaluation and comments.
Refer to the "Drive Maintenance WARNING" before starting disassembly. Also make sure the power to the drive has been disconnected or locked out to prevent the drive from being accidentally started.

A. Removal of the Worm Drive

1. Remove the guards, disconnect all chains and disconnect the gearmotor.

2. Drain the oil from the worm housing.

3. Remove the capscrews (23), connecting the worm housing (16) to the main drive (refer to Figure 25).

**Figure 23**

<table>
<thead>
<tr>
<th>Figure 23</th>
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<tbody>
<tr>
<td>1- Lifting cables</td>
</tr>
<tr>
<td>2- Worm gear drive assembly</td>
</tr>
</tbody>
</table>
4. Lift the worm gear assembly from the drive, referring to the lifting illustration. See Figure 23. Place four (4) eye bolts symmetrically through the upper cover screw holes into the housing and lift with cables. If shims are in place between the worm housing and lower drive, match mark them so they can be returned to their original positions.

**CAUTION:** Use care when removing the unit from the main gear to prevent damage to the drive control, pinion, main gear and bearings.

5. Place the worm gear unit on supports as shown in Figure 24. Make sure this device will support the weight of the worm gear unit.

![Figure 24](image)

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1-</td>
<td>Worm gear drive assembly</td>
</tr>
<tr>
<td>2-</td>
<td>Support</td>
</tr>
</tbody>
</table>

**B. Disassembly of the Worm Drive**

1. Remove the drive control and drive control pin (9).

2. Remove the capscrews and end cap (3). Remove the spring seat (4) and the spring (6).

3. Remove the capscrews and bushing housing assembly (25).
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive Cover</td>
<td>14</td>
<td>Bearing Retaining Ring</td>
</tr>
<tr>
<td>2</td>
<td>Pipe Plug</td>
<td>15</td>
<td>Oil Gauge</td>
</tr>
<tr>
<td>3</td>
<td>End Cap Cap screw</td>
<td>16</td>
<td>Worm Housing</td>
</tr>
<tr>
<td>4</td>
<td>Spring Seat</td>
<td>17</td>
<td>Oil Seals</td>
</tr>
<tr>
<td>5</td>
<td>Adjusting Screw</td>
<td>18</td>
<td>Main Drive or Secondary Drive (Ref)</td>
</tr>
<tr>
<td>6</td>
<td>Spring</td>
<td>19</td>
<td>Pinion Gear</td>
</tr>
<tr>
<td>7</td>
<td>Sliding Bearing Seat with O-Ring</td>
<td>20</td>
<td>Bearing Inner Race</td>
</tr>
<tr>
<td>8</td>
<td>Key</td>
<td>21</td>
<td>Bearing Race</td>
</tr>
<tr>
<td>9</td>
<td>Drive Control</td>
<td>22</td>
<td>Bearing Retaining Ring</td>
</tr>
<tr>
<td>10</td>
<td>Bearing</td>
<td>23</td>
<td>Cap Screws &amp; Ring Lockwashers</td>
</tr>
<tr>
<td>11</td>
<td>Gear Retaining Ring</td>
<td>24</td>
<td>Pinion Bearing</td>
</tr>
<tr>
<td>12</td>
<td>Worm and Shaft</td>
<td>25</td>
<td>Bashing Housing</td>
</tr>
<tr>
<td>13</td>
<td>Worm Gear Assembly</td>
<td>26</td>
<td>Oil Seal</td>
</tr>
</tbody>
</table>
4. Remove the worm shaft (12) and bearing (10) with the sliding bearing seat and O-ring (7) by turning the worm shaft so that the worm moves to the non drive end (spring end).

Also, note that the drive is furnished with 1 bearing (10).

5. Remove the housing capscrews and cover (1).

6. Place blocking under the pinion (19) to prevent it from falling out of the drive when the retaining ring (11) is removed from the gear. Then remove the retaining ring (11), and the key (8). Remove the worm gear (13).

7. Support the pinion (19) (using an eyebolt in the top of the pinion) and lower it down through the housing as the blocking is removed.

8. Remove the pinion upper bearing retaining ring (14). Then remove the bearing (24) using a puller. Remove the oil seals (17).

9. Remove the pinion lower bearing retaining ring (22) and the bearing inner race (20) from the end of the pinion. Then remove the outer bearing race (21) from the bottom of the main gear housing.

10. Remove the sliding bearing seat (7), and bearing (10) from the worm shaft (12). Use a bearing puller if necessary.

C. Inspection

1. Inspect the teeth of the worm gear and pinion and the worm for the following:

a. Abrasive Wear: Wear will show at random spacing across the gear teeth and worm. Dirt or other foreign material in the lube oil normally causes this.

b. Scoring: This is shown by vertical scratches and/or grooves running from the pitch line (approx. center of tooth or worm) to the top of the tooth or worm. It can result from improper lubrication or abrasive materials in the lubricant.

c. Pitting: It is evident in large or numerous pits in the gear teeth and worm. Note that small pits may occur during run-in of a new gear, but these will smooth out as the gear wears in. Overload, poor lubrication or improper lubricant causes it.

d. Galling: This condition appears as numerous deep grooves or gouges and it is caused by overload of gearing for the lubricant used.
e. Normal Wear: Eventually all gears and worms wear out due to long use and/or prolonged overload. Replacement should be considered based on the condition of the gearing and extent of the wear.

2. Depending on the condition of the worm and gear, replacement may be required depending on the severity of the condition and the affect that a breakdown would have on the operation. Small scratches can be removed by repolishing the surface but if the scratches are large or deep, such as galling, replacement of the worm may be necessary, since the operating life would be limited. Would failure cause damage to the components? Cause production stoppage?

3. Inspect the bearing balls for pitting or scoring. If there is any question about the condition of a bearing, it should be replaced.

4. All parts should be cleaned with a solvent, then coated with light oil for inspection. Never rotate a dry bearing.

D. Reassembly of the Worm Drive

**CAUTION:** Gaskets in the drive unit are not to be used, except where specified on the assembly drawings and parts list.

Notes:

(a) Take care to prevent dirt or foreign matter from getting into the worm assembly. All parts must be cleaned with a solvent before reassembly and blown dry. Coat the bearings and seals with a film of oil.

(b) Inspect all parts for damage or wear and replace as necessary.

(c) Check all bearings for pitting, roughness of rotation or scoring. Replace all bearings on a shaft if one is defective.

(d) Coat all bearings and bushings liberally with grease or oil before they are installed.

(e) Oil seals are subject to deterioration and should be replaced with new seals when the unit is reassembled, even though the deterioration may not show.

1. Mount the pinion bearing inner race (20) on the pinion shaft (19) and install the retaining ring (22). Install the outer race (21) inside the main drive housing bearing packet.

2. Install the oil seals (17) inside the worm housing (16), referring to Figure 26. The oil seals must be installed as shown with the lips facing upwards.
3. Pull the pinion (17) up through the worm housing (16) with an eyebolt and cable and support the pinion from below with blocking. (First, cover the keyway with tape to prevent it from cutting the seals.)

4. Install the bearing (24) over the shaft. Tap the bearing (24) in as necessary to seat, using a tubular driver. Then install the retaining ring (14).

5. Mount the worm gear (13) on the pinion shaft and install the key (8). Using a hammer and block of wood, drive the worm gear down until the retaining ring groove is exposed. Then install the retaining ring (11).

   Note: Do not drive directly on the worm gear, use a block of wood.

6. Place the bearing (10) in the sliding bearing seat (7), as shown in Figure 27.

   **CAUTION:** The bearing must be installed as shown to take the thrust towards the spring. Improper assembly will cause bearing failure.

7. Check the O-ring on the sliding bearing seat (7) for cracking or signs of wear. Replace if necessary.

8. Mount the sliding bearing seat (7) and bearing (10) on the worm shaft (12). The bearing must seat against the worm shoulder. Use a tubular driver or place the end of the worm on a block of wood and drive on the bearing housing, using a block of wood and hammer.
9. Insert the worm into the gear housing (from the non-drive end) turning it as necessary to mesh with the worm gear threads. (Coat the worm with oil.)

10. Coat both ends of the worm housing with Ultra Blue RTV-Silicone. Then place the spring (6) over the shaft and install the spring seat (4) and end cap (3). Secure the bolts. Do not turn the spring adjusting screw plug or nut (5).

11. Place the bushing housing (25) over the shaft and install the capscrews. Turn the bolts equally when tightening.

Note: If the bushing was replaced, make sure it is flush with the inside face of the housing.

12. Install the oil seal (26) as shown in Figure 28. First, cover the keyway with tape to prevent the seal being cut.

13. If removed, screw the actuating pin into the drive control assembly, referring to Figure 25. Torque the pin to 20-25 ft. lbs.

14. Install the drive control, referring to "E. Drive Control Installation" on a following page.

15. Turn the worm by hand to be sure all parts are properly installed and rotate freely.
16. Apply Ultra Blue RTV-Silicone to the worm gear housing lower mounting face. Lift the worm gear assembly, referring to the lifting instructions, and set it in position on the drive. Align the gear housing with the bottom drive referring to the Drive Assembly Drawing for orientation.

   **Note:** If shims were used between the worm housing and the drive, return them to their original positions.

17. Install the cover (1) using Ultra Blue RTV-Silicone between the cover and housing. Secure the capscrews.

18. Lubricate the drive referring to the Lubrication Instructions.

19. Install guards, gearmotor, etc.

   **CAUTION:** If provided with shaft mounted reducer(s), the motor/reducer assembly must be blocked in position until the torque arm is installed.

20. Reconnect the electrical wiring and check for proper drive rotation.

E. Drive Control Installation

1. Run a bead of Ultra Blue RTV-silicone around the pin slot in the worm housing. Install the mounting plate (2), using the capscrews provided, centering the slot in the mounting plate (2) over the slot in the worm housing. Torque the capscrews to 50-60 ft. lbs.

2. Set the drive control (1) in place on the mounting plate (2), then install (but Do Not secure) the drive control mounting capscrews (3) with washer plates (4).
3. Adjust the drive control by sliding it until the alignment hole (5) in the drive control housing (1) lines up with the matching hole in the mounting plate (2). Refer to Figure 29. The drive control pointer should indicate "zero". Install the alignment capscrew in the alignment hole(s). Then, secure the drive control mounting capscrews (3).

4. Check the drive control for activation, referring to the Drive Maintenance Instructions.

---

**Figure 29**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive Control Housing</td>
</tr>
<tr>
<td>2</td>
<td>Mounting Plate</td>
</tr>
<tr>
<td>3</td>
<td>Mounting Capscrews</td>
</tr>
<tr>
<td>4</td>
<td>Washer Plate</td>
</tr>
<tr>
<td>5</td>
<td>Alignment Hole in Housing Must Line up With Matching Hole in Mounting Plate. Then Install Capscrew.</td>
</tr>
</tbody>
</table>
No special tools are required for maintenance or repair of this equipment.

**WARNING:** Check the drive for torque, referring to the proceeding "Drive Maintenance WARNING" before starting disassembly. Also make sure the power to the drive has been disconnected or blocked out to prevent the drive from being accidentally started.

1. Disconnect or block out all electrical power to the drive.

2. Support the rake arms in position on blocking. Additional support must be used to keep the skimmer upright and the skimmer arm must be disconnected from the feedwell. Disconnect the arms from the cage.

3. Disconnect the cage from the drive unit and lower the cage to the tank bottom.

4. Remove the walkway and platform.

A. Disassembly of the Main Gear

The drive base must not be removed from the column during the disassembly of the drive.

1. Remove the worm gear assembly, referring to the Worm Gear Disassembly and Reassembly Instructions.

2. Remove the main gear cover.

3. Remove the main gear from the drive base, using lifting bolts (not by Baker Process) at each of the four-(4) cage take-up stud mounting holes on the gear.

   Note: Do not remove the drive base from the column.

4. Place the main gear on blocking, upside down, allowing adequate room for inspection of the main gear teeth and bearing strips.

B. Inspection

1. Inspect the teeth of the main gear for the following:

   a. Abrasive Wear: The wear on the teeth will show at random spacing across the teeth. Dirt or other foreign material in the lube oil normally causes this.
b. Scoring: This is shown by vertical scratches and/or grooves running from the pitch line (approx. center of tooth) to the top of the tooth. It can result from improper lubrication or abrasive materials in the lubricant.

c. Pitting: It is evident in large or numerous pits in the gear teeth. Note that small pits may occur during run-in of a new gear, but these will smooth out as the gear wears in. It is caused by overload on gear, poor lubrication or improper lubricant.

d. Galling: This condition appears on the gear teeth as numerous deep grooves or gouges and it is caused by overload of the gear for the lubricant used.

e. Normal Wear: Eventually all gears wear out due to long use and/or prolonged overload. Replacement should be considered based on the condition of the gearing and extent of the wear.

2. Replace the gear, as necessary, depending on the severity and extent of these conditions.

3. Clean the bearing balls and strips with solvent or kerosene and coat them with light oil.

4. Carefully inspect all bearing balls for pitting or scoring. Check the balls for uneven wear, using a micrometer. Refer to the Parts List for specified ball diameter.

5. Inspect the bearing strips on the main gear and drive base for wear and pitting and replace, if necessary. Refer to the Bearing Strip Replacement Instructions on a following page.

C. Bearing Strip Replacement

Note: All bearing strips on the main gear and the drive base should be replaced at the same time. The following procedure covers installation of a bearing strip on the main gear, but it is typical for all four (4)-bearing strips on the drive unit.

1. Place the main gear upside down on blocking for access to the bearing strips. See Figure 30.

2. Using the strip removal slot, carefully pry one end of the bearing strip out of the mounting groove. Then, starting at the free end of the strip, pull the rest of the bearing strip out of the mounting groove.
### Figure 30

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top Bearing Strip</td>
<td>2</td>
<td>Inner Bearing Strip</td>
</tr>
<tr>
<td>4</td>
<td>Strip Removing Slot</td>
<td>5</td>
<td>Blocking</td>
</tr>
<tr>
<td>7</td>
<td>Bottom Bearing Strip</td>
<td>8</td>
<td>Outer bearing Strip</td>
</tr>
<tr>
<td>10</td>
<td>Column (Ref)</td>
<td>Note: Polished Surface Faces Out</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION:** Care must be taken to avoid damaging the mounting groove.

3. Clean the mounting groove with solvent and blow dry.

4. Trim off one straight end section of bearing strip only, as shown in Figure 31. The cut should be made on a radial line from the drive center to provide the proper angle at the joint. Note that the polished surface of the new strip will be facing out.

**CAUTION:** Do not use a cutting torch to trim the bearing strip.

*Note:* Polished surface of the bearing strip must face out.

5. Start the trimmed end of the bearing strip (polished surface facing out) into the mounting groove approximately 2" [50.80 mm] away from the removal slot on the inner and outer strips and 3" [76.2 mm] away from the removal slot on the upper and lower strips. Use a brass bar and hammer or a clamp (not by Baker Process), as shown in Figures 32 and 34.
**CAUTION:** Do not hammer directly on the bearing strip, as this will damage the surface of the strip.

6. Work the bearing strip gradually down into the groove, while working around the strip. Take care to avoid gouging metal off the drive base or main gear into the mounting groove, as this will prevent the bearing strip from seating in the groove.

Note: The bearing strip must be worked gradually into the groove all around the circumference of the strip. Force seating the bearing strip, as shown in Figure 33, will bend or deform the strip, making it impossible to properly seat the bearing strip in the mounting groove.

7. Referring to Figure 35, mark and field trim the trailing end of the bearing strip where it overlaps the leading end.

**CAUTION:** Do not use a cutting torch to trim the bearing strip.
8. Check to be sure the mounting groove is free of all metal particles and debris, then finish seating the bearing strip in the mounting groove. Care must be taken to obtain a clean, tight joint. The ends of the bearing strip must butt together with a maximum 1/32" [0.794 mm] gap between the ends. See Figure 36.

9. Check to be sure the bearing strip is completely seated all around.

10. After the strips are installed, polish the bearing surfaces on the strips to 32 RMS finish. Use a 120 Emery cloth for polishing.

D. Reassembly of the Main Gear

1. Thoroughly clean all parts, including housing, before reassembly. Remove all gasket and packing material.

**CAUTION:** Gaskets in the drive unit are not to be used, except where specified on the assembly drawings and parts list.
Figure 33

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Force Seating will Bend or Deform Bearing Strip</td>
</tr>
<tr>
<td>2</td>
<td>Brass Bar (Not by Baker Process)</td>
</tr>
<tr>
<td>3</td>
<td>Bearing Strip</td>
</tr>
<tr>
<td>4</td>
<td>Mounting Strip</td>
</tr>
<tr>
<td>5</td>
<td>Incorrect Work Bearing Strip in Gradually. Do Not Force Seating of Bearing Strip.</td>
</tr>
</tbody>
</table>

Figure 34

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing Strips</td>
</tr>
<tr>
<td>2</td>
<td>Main Gear</td>
</tr>
<tr>
<td>3</td>
<td>C-Clamp</td>
</tr>
<tr>
<td>4</td>
<td>Brass Bar or Block of Wood</td>
</tr>
<tr>
<td>5</td>
<td>Blocking</td>
</tr>
</tbody>
</table>
Figure 35

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing Strip Trailing End</td>
</tr>
<tr>
<td>2</td>
<td>Removal Slot</td>
</tr>
<tr>
<td>3</td>
<td>Bearing Strip Leading End</td>
</tr>
<tr>
<td>4</td>
<td>Mark and Field Trim</td>
</tr>
</tbody>
</table>

Figure 36

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing Strip</td>
</tr>
<tr>
<td>2</td>
<td>Maximum 1/32&quot; [0.794 mm] Gap at Joint</td>
</tr>
</tbody>
</table>
Notes:

a. Take care to prevent dirt or foreign matter from getting into the drive assembly. All parts must be cleaned with a solvent before reassembly and blown dry.

b. Seals, packing and gaskets should be replaced whenever the unit is disassembled.

c. Inspect all parts for damage or wear and replace as necessary. Refer to the "Inspection".

2. Coat bearing balls with grease, then set the balls in place in the drive base. Refer to the parts list for the specified number of bearing balls required.

3. If the lip seal between the drive base housing and the main gear is being replaced, refer below to item "E. Replacement of the Lip Seals".

4. Apply Mobilith AW-2 grease to the areas on the main gear where the lip seals will slide.

5. Referring to the Main Gear Disassembly Instructions for lifting, set the main gear in place, resting on the bearing balls.

6. If the lip seal between the main gear and the cover is being replaced, refer to the instructions below for the lip seals.

7. Apply Mobilith AW-2 grease to the areas on the main gear cover where the lip seals will slide.

8. Install the main gear cover, using Ultra Blue RTV-Silicone at the joints, as specified on the Drive Assembly Drawing.

9. Install the worm gear assembly, referring to the Worm Gear Disassembly and Reassembly Instructions.

10. Reconnect the cage to the drive unit, reconnect the skimmer arm and rake arms, reinstall the walkway and platform and remove all temporary shoring.

11. Lubricate the drive referring to the Lubrication Instructions.

12. Install the gearmotor, guards, etc.

13. Connect the electrical wiring and check for proper drive rotation.
E. Replacement of the Lip Seals

1. Thoroughly clean the seal mounting surfaces. These surfaces must be free of dirt, grease, or any foreign matter.

2. Measure a seal for cutting by laying it in position on the housing or gear-mounting surface, where it will be located. The sealing surface must be oriented as shown on the Drive Assembly Drawing. Make a square cut on the end of the seal, leaving a slight overlap. Refer to the Assembly Drawing and Figure 37.

![Figure 37](image)

3. Apply sealant (bonding agent) (Baker Process Part No. 88899A) over the mounting surfaces where the seals will be installed.

4. Referring to Figure 37, set the lip seal in place, except the last 12 [304.8 mm] inches of one end of the seal, making sure the seal lip is facing in the direction shown on the Drive Assembly Drawing. Since bonding will take place within 45 seconds of contact, take care in setting the seal in place.

5. Bring the uncremented end together with the opposite end. Mark and cut the end of the seal for a square, butt fit against the opposite end.
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<table>
<thead>
<tr>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>6.</td>
<td>Apply the sealant (bonding agent) to both square ends and set the seal in place. Press the ends together until a firm bond is made.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Apply sealant (bonding agent) to the inside angle of the seal at the splice, for about 3&quot; [76.2 mm] on both sides of the splice. Then, glue a 4&quot; [101.6 mm] long piece of wire rope (Baker Process part no. 88951C) in place, as shown in Figure 37, centered on the splice.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Allow the bonding agent to harden, then use additional bonding agent to seal (encapsulate) the piece of wire rope in position.</td>
<td></td>
</tr>
</tbody>
</table>
Oil Seal Installation Procedure:

Careless installation is one of the most common reasons for seal problems. The installation mechanic can prevent these problems by reviewing and following these instructions.

Seal Components

Seals are made up of the following basic components, each performing a particular function, such as:

1. Outer Shell (Case). The outer, cup-shaped, rigid structure of the lip seal assembly. Acts as a protective cover for the head of the sealing element.

2. Inner Shell (Case). A rigid cup-shaped component of a seal assembly, which is placed inside the outer seal case. It can function as a reinforcing member, shield, and spring retainer or lip clamping device.

3. Sealing Element. The normally flexible elastomeric component of a lip seal assembly, which rides against the shaft.

![Diagram of seal components](image)

**Figure 38**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Outer Shell (Case)</td>
<td>5-</td>
</tr>
<tr>
<td>2-</td>
<td>Inner Shell (Case)</td>
<td>6-</td>
</tr>
<tr>
<td>3-</td>
<td>Sealing Element</td>
<td>7-</td>
</tr>
<tr>
<td>4-</td>
<td>Primary Lip</td>
<td></td>
</tr>
</tbody>
</table>
4. **Primary Lip.** The flexible elastomeric component of a lip seal which contacts the rotating surface.

5. **Secondary Lip (Auxiliary Lip).** A short, non-spring loaded lip, which is located at the outside, seal face of a radial lip seal. Used to exclude contaminants.

6. **Garter Spring.** A coiled wire spring with its ends connected. It is used for maintaining a sealing force between the sealing element and sealing surface.

**Proper Installation Procedures**

The seal is ready to be installed in the bore once the old seal has been removed, and the shaft and bore have been checked and cleaned. The seal should be pre-lubricated before installation.

**Pre-Lubrication**

The lip of the seal must be pre-lubed before the seal is installed. This step is important because pre-lubrication provides a film on which the seal rides until there is ample lubricant in the seal cavity.

The best pre-lube to use is the lubricant being used in the drive unit. Refer to the Lubrication Instructions.

**Tools**

A hydraulic press that applies uniform pressure against the seal is recommended. However, if a press is not available or not practical, a round tool, such as a bearing cup, is excellent. The installation tool must follow the seal into the bore, and it should be slightly smaller that the outside diameter of the seal. (An O.D. ten thousandths of an inch smaller than the bore is ideal.) For best results, the center of the tool should be open so pressure is applied only at the outer edge of the seal case.

The tools used to install seals can often affect seal performance. For instance, a screwdriver may easily cut the seal lip or bend the case and cause the seal to leak. Even blunt-end drifts can damage the seal case or distort the seal from its proper working position.

**CAUTION:** Sealing damage may result when:

a. Using a steel hammer,
b. Using a drift or punch,
c. Using a chisel or screwdriver,
d. Using direct hammer blows on the face of the seal, or
e. Starting seal into bore at an angle (cocked)
Hammering

Use a soft-faced or dead-blow hammer or mallet against an installation tool when installing seals. (Refer to Figure 39). This type of tool, like a block of wood, absorbs the shock wave created by the tool’s impact. A hammer blow without any material to absorb the shock wave can dislodge the garter spring from its proper operating position. Once the spring is out of position, the seal will fail. It may even interfere with the action of the seal lip, or find its way into the bearing.

![Figure 39](image)

<table>
<thead>
<tr>
<th>Figure 39</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Tool</td>
</tr>
</tbody>
</table>

Whatever tool is used, remember that seating force must be applied and spread out around the entire circumference of the seal. A direct blow on one side of the seal distorts the case and can cause the lip to be pressed against the shaft. This action produces increased friction between the lip and the shaft surface.

If installation pressure is applied to the seal’s inside diameter, the case is forced upward, lifting the lip from the shaft surface. If the seal is cocked -- not perpendicular to the shaft and bore -- the result will be too much contact on one side, and not enough on the other. The seal will leak as the shaft is deflected by shaft-to-bore misalignment or runout. Seals must be seated up against the bore shoulder to achieve perpendicularity of sealing lip to shaft.

Sealing lips must not be painted. Coating the seal case is acceptable after installation. Shaft seal surfaces including those seal surfaces that move axially must be free from paint, nicks, scratches, etc. in the area where the seals are to function.
The skimming device is designed to skim the surface of the tank and push the floating scum towards the periphery where the scum scraper will collect it and dump it into the scum box. To operate correctly the skimmer blade and scum scraper must be proper submergence, the skimming device assembly must pivot and rotate correctly and the wipers must be able to wipe most solids from their contact surfaces.

**CHECK POINTS BEFORE START-UP**

Observe skimming device rotation for several complete revolutions. The scum scraper must be level, proper elevation and aligned parallel to the leading "drop" edge of the scum box, as shown in Figure 40. The scum scraper should be submerged about 3" (76.2 mm) and all wipers, or scrapers, must contact their wiping surfaces on the baffles and scum box. The baffles must provide a smooth and uninterrupted surface for the scraper. Any deviation should be adjusted as specified below.

![Figure 40](image)

<table>
<thead>
<tr>
<th>Figure 40</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1-</strong> Direction of Skimmer Travel</td>
</tr>
<tr>
<td><strong>2-</strong> Skimmer Arm</td>
</tr>
<tr>
<td><strong>3-</strong> Arm Clevis with Set Screw</td>
</tr>
<tr>
<td><strong>4-</strong> Stop Rod</td>
</tr>
<tr>
<td><strong>5-</strong> Collar</td>
</tr>
</tbody>
</table>
SKIMMER ADJUSTMENT

1. Adjust the scum scraper for parallel alignment with the scum box discharge leading "drop" edge, if necessary, referring to Figures 41, 42, and 43. Shift the arm clevis and collar for the trailing side of the scum scraper only. Do not shift the leading side arm clevis or collar.

![Diagram of scum scraper](image)/Figure 41

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1-</td>
<td>Direction of Skimmer Travel</td>
</tr>
<tr>
<td>2-</td>
<td>Skimmer Arm</td>
</tr>
<tr>
<td>11-</td>
<td>Loosen Arm Clevis Setscrew and Collar Capscrew and Nut. Then Shift Collar and Arm Clevis as Shown to Pull Trailing Side of Scum Scraper into Alignment as Shown.</td>
</tr>
<tr>
<td>12-</td>
<td>Do Not Shift This (Leading side) Arm Clevis or Collar. Shift Arm Clevis and Collar on Trailing Side Only.</td>
</tr>
</tbody>
</table>

2. Adjust the scum scraper for specified skimming depth, as specified on the drawings (normally 3" submergence), using the collars (collars, clevis and stop rods). Note that the arm clevis should allow the scum scraper to rise up and over the scum box ramp for discharge, but the collars (and stop rod) should stop the scum scraper from dropping below the adjusted submergence level (about 3" (76.2 mm) submergence).
3. Adjust the scum scraper wipers, as required, for contact with their wiping surfaces on the scum box and baffle, using the slotted mounting holes in the wipers.

4. Adjust the hinged skimmer (vertical hinged deflector) radially and longitudinally on the skimmer arm within the 6" (152.4 mm) [nominal] allowed to maintain contact with the inner vertical skirt of the scum box. This is to minimize the loss of scum when the scum scraper goes up the scum box ramp.

5. Adjust the spring tension on the hinged skimmer, as specified on the assembly drawing, by shifting the hinged skimmer support and collar on the skimmer arm within the 6" (152.4-mm) [nominal] allowed. This tension should force the scum scraper to pivot horizontally so it will contact the inner surface of the scum baffle (normal spring tension is about 8 lbs. [3.6 kg] against the wiper).

---

**Figure 42**

<table>
<thead>
<tr>
<th>Figure 42</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
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<tr>
<td>2-</td>
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<tr>
<td>12-</td>
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<tr>
<td>13-</td>
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<td>14-</td>
</tr>
</tbody>
</table>
UPKEEP AND MAINTENANCE

Once a week, check that the skimming device assembly is collecting the scum from the baffle and carrying it to and into the scum box. This includes the neoprene wipers and hinged skimmer. It is particularly important when the scum scraper passes over the scum box that scum does not run back and down the ramp.

Clean the scum box beach and ramp, as required by operating conditions, to keep them free of heavy scum/float accumulations that could cause skimmer damage.

Icing of the scum box beach and box can also cause skimmer damage. Clean the beach and box, as required by local operating conditions to keep them free from ice.

![Figure 43](image_url)

<table>
<thead>
<tr>
<th>1-</th>
<th>Direction of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-</td>
<td>Loosen Arm Clevis Setscrew and Collar and Collar Cap Screws and Nut. Then Shift Collar and Arm Clevis as Shown to Pull Trailing Side of Scum Scraper into Alignment with Scum Box Discharge Leading &quot;Droop&quot; Edge.</td>
</tr>
</tbody>
</table>

The skimming device assembly is not designed to push ice or other heavy floating items or accumulations. During icing or severe surface float conditions, lock the scum scraper in position above the liquid level on top of the skimmer arm. To raise the scum scraper assembly, lift the scum scraper blade vertically (it will rotate on the arm clevises) above the skimmer arm. Then, move the blade horizontally toward the center of the tank, folding the scum scraper blade and scraper arms down to a position on top of the skimmer arm and vertical hinged skimmer.
CAUTION: Make sure the skimming device rests securely in position. It must not be allowed to slip off to either side of the skimmer arm during operation.

CAUTION: Make sure the skimmer assembly does not contact the walkway superstructure or other stationary objects as it is rotated around the tank in this "out of service" condition.

Note: When the skimming device is placed back into operation, pull the vertical hinged skimmer out of the way before lowering the scum scraper blade back into operating position. Then, check the skimming device for proper adjustment, referring to the Skimmer Maintenance Instructions above.
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
</table>
| 1. Overload alarm sound-or, drive operates at high torque for several days | a. Torque build up on drive and mechanism | (1) Reduce solids feed to clarifier and check for operating problem.  
(2) Check for grit in sludge. See Operation  
(3) Check skimmer for hang up  
(4) Check for foreign object in tank. Stop drive if pointer is jumping |
| 2. Drive stops | a. Loss of electrical power | (1) Check power source  
(2) Check control fuse |
|             | b. Drive control cutout | (1) If pointer on control is at maximum cut-out, drain tank to locate problem Do not bypass control  
(2) If pointer is not at maximum torque, check control. See maintenance instructions |
|             | c. Motor drive(s) cutout | (1) Check for overheating refer to manufacturer's instructions  
(2) Check for broken chain |
| 3. Solids in effluent | a. Overloading of clarifier | (1) Check flow rate and feed solids content  
Refer to Operation  
(2) Reduce sludge blanket level. See Operation |
|             | b. Inadequate flocculation | (1) Check for finely dispersed solids. See Operating Instructions |
|             | c. Flow through tank short-circuiting | (1) Adjust weirs for even overflow or convergent leakage  
(2) Adjust baffles for convergent leakage |
| 4. Low solids content in sludge | a. Inadequate sludge blanket in tank | (1) Check flow rate. See Operating Instructions |
|             | b. Inadequate flocculation | (1) Check for finely dispersed solids in cFluent. See Operating Instructions |
| 5. Excessive floating scum | a. Skimmer malfunction | (1) Adjust skimmer for smooth operation and replace wipers. Refer to Skimmer Maintenance Instructions  
(2) Adjust hinged skimmer (deflector) to trap solids. See Skimmer Maintenance Instructions |
|             | b. Septic conditions on bottom of tank (pieces of floating sludge and objectionable odor) | (1) Check for clogged discharge line. See Operating Instructions  
(2) Squeegies need replacement. See Maintenance Instructions  
(3) Check sludge removal schedule. May require more frequent intervals of removal |
<p>| 6. Excessive growth on weirs and baffles | a. Accumulation of solids causes algae | (1) Increase frequency of cleaning |</p>
<table>
<thead>
<tr>
<th>State</th>
<th>Address</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Birmingham. 600 Vestavia Parkway, Suite 203, Birmingham, Zip 35216; Telephone 205/822-1730; Fax 205/979-5345</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>Palatine. 800 East Northwest Highway, Suite 430, Zip 60067-6536; Tel. 708/358/1100; Fax 708/358-1104</td>
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<tr>
<td>New York Area</td>
<td>Union, N.J. 1620 Route #22, Zip 07083-3485; Tel. 908/964-8600; Fax 908/964-6791</td>
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<tr>
<td>*Pennsylvania</td>
<td>Moon Township. One Thorn Run Center, 1187 Thorn Run Road, Suite 610, Zip 15108; Tel. 412/604-6060; Fax 412/604-6061</td>
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<tr>
<td>Texas</td>
<td>Houston. 14990 Yorktown Plaza Drive, Suite 129L, Zip 77040; Tel. 713/934-4400; Fax 713/934-4401</td>
<td></td>
</tr>
<tr>
<td>*Utah</td>
<td>Salt Lake City (Intermountain Sales District Office). 669 West Second South, Zip 84101-1604; P.O. Box 300, Zip 84110-0300; Tel. 801/526-2406; Telex: 38-8331; Answer back: Baker Process PTS SLC; Fax 801/526-2005</td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>16703 SE McGillivray Blvd., Suite 225, Vancouver, WA 98683; Tel. 360/604-2777; Fax 360/604-2778</td>
<td></td>
</tr>
</tbody>
</table>

*Municipal Service is available from these offices, or Municipal Agents.
Eastern Region

A.E. Hatch Associates
5948 Butternut Drive
East Syracuse, NY 13057-9517
315/463-7172 Fax 315/463-5077

Bowen, Calhoun & Associates
828 Dulaney Valley Road
Suite 7
Towson, MD 21204
410/321-8930 Fax 410/321-1625

Ecology Equipment Co., Inc.
2039 Dixie Highway
Fl. Mitchell, KY 40111
606/344-8013 Fax 606/344-8085

Waterworks Systems & Equipment, Inc.
5275 Redding Drive
Lakeland, MI 48143
810/231-1200 Fax 810/231-1331

Badrena & Perez, Inc.
P.O. Box 6368 - Loiza Street Station
San Juan, Puerto Rico 00914
787/728-7171 Fax: 787/728-0580

David F. Sullivan & Associates
P.O. Box 214
Newtown, CT 06470-0214
203/426-6390 Fax 203/426-0057

Fogarty-Lavalle Associates, Inc.
3 Dogwood Lane
Wilton, CT 06897
203/762-0853 Fax 203/762-7170

Waterworks Systems & Equipment, Inc.
4513 Franklin Blvd.
Cleveland, Ohio 44102
216/961-5215 Fax 216/961-5266

Bowen, Calhoun & Associates
998 Old Eagle School Rd. - Suite 1214
Wayne, PA 19087-1805
610/688-3808 Fax 610/688-2290

David F. Sullivan & Associates
727 Lafayette Road
Seabrook, NH 03874
603/474-2484 Fax 603/474-3682

Fogarty-Lavalle Associates, Inc.
15 Renee Lane
Blauvelt, NY 10913
914/359-8008 Fax 914/365-1421

W.C. Weil Company
4068 Mt. Royal Blvd.
Ganna Bldg., Suite 221
Allison Park, PA 15101
412/487-7140 Fax 412/487-7144

Southeast Region

EW2 Environmental, Inc.
7523 Little Ave., Suite 214
Charlotte, NC 28226
704/542-2444 Fax 704/542-7003

TSC Corporation
One Memorial Center
4919 Memorial Hwy., Suite 250
Tampa, FL 33634
813/888-5556 Fax 813/889-0777

EW2 Environmental, Inc.
1304 Waverly Road
Wilson, NC 27896
252/291-1852 Fax 252/291-4048

Principle Environmental, Inc.
1770 The Exchange NW
Suite 210
Atlanta, GA 30339
770/952-9444 Fax 770/952-7933

Central Region

Doonan Environmental
809 West Spring
Eldridge, IA 52748
319/285-4038 Fax 319/285-4718

Fluid Equipment Company, Inc.
1415 Elbridge Payne, Suite 275
Chesterfield, MO 63017
636/532-3521 Fax 636/532-2119

DWE Incorporated
3404 Lincoln Court
Indianapolis, IN 46228
317/328-1975 Fax 317/328-1985

Fluid Equipment Company, Inc.
Sanning Realty Building
Business 54, Highway W
Lake Ozark, MO 65049
573/365-7756 Fax 573/365-9684

Emergences Inc.
W59 N249 Cardinal Avenue
Cedarburg, WI 53012
262/377-6360 Fax 262/377-1515

Mace Hewitt & Affiliates
9104 South Fairchills road
Assaria, KS 67416
785/668-2610 Fax 785/668-2612
### Central Region (Continued)

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>City, State, Zip</th>
<th>Phone, Fax</th>
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<tbody>
<tr>
<td>Graue Hewitt &amp; Affiliates</td>
<td>10608 Oakland Avenue</td>
<td>Kansas City, MO 64134</td>
<td>816/966-1900 Fax 816/965-8566</td>
</tr>
<tr>
<td>Hawkins &amp; Affiliates</td>
<td>1426 Stone Trail Drive</td>
<td>Sugar Land, TX 77479</td>
<td>281/343-1993 Fax 281/343-1995</td>
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<tr>
<td>Hydronics, Inc.</td>
<td>805 Business Parkway</td>
<td>Richardson, TX 75081</td>
<td>972/234-0001 Fax 972/234-0006</td>
</tr>
<tr>
<td>MC2, Inc.</td>
<td>2320 So. 156th Circle</td>
<td>Omaha, NE 68130-2511</td>
<td>402/333-9660 Fax 402/333-9663</td>
</tr>
<tr>
<td>S.A. Russell, Inc.</td>
<td>8214 Triple Crown</td>
<td>Fair Oaks Ranch, TX 78015</td>
<td>210/698-2073 Fax 210/698-9101</td>
</tr>
<tr>
<td>Van Bergan &amp; Markson</td>
<td>8814 - 7th Avenue North</td>
<td>Minneapolis, MN 55427</td>
<td>612/546-4340 Fax 612/546-0973</td>
</tr>
<tr>
<td>Water Technology Group</td>
<td>2755 South Locust Street</td>
<td>Denver, CO 80222</td>
<td>303/584-9000 Fax 303/584-9920</td>
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### Western Region

<table>
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<tr>
<th>Company</th>
<th>Address</th>
<th>City, State, Zip</th>
<th>Phone, Fax</th>
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</thead>
<tbody>
<tr>
<td>Beaver Equipment Specialty</td>
<td>19093 Beavercreek Road, #336</td>
<td>Oregon City, OR 97045</td>
<td>503/723-6201 Fax 503/723-6200</td>
</tr>
<tr>
<td>Coombs-Hopkins Company</td>
<td>668 North 44th Street, Suite 251</td>
<td>Phoenix, AZ 85008</td>
<td>602/275-4303 Fax 602/275-4229</td>
</tr>
<tr>
<td>D.C. Frost Associates, Inc.</td>
<td>8621 Olive School Lane</td>
<td>Winters, CA 95649</td>
<td>530/795-5006 Fax 530/795-5024</td>
</tr>
<tr>
<td>D.C. Frost Associates, Inc.</td>
<td>2652 San Antonio Drive</td>
<td>Walnut Creek, CA 94598</td>
<td>925/947-6733 Fax 925/947-6784</td>
</tr>
<tr>
<td>Promark Corporation</td>
<td>98-781 Oilsiana Place</td>
<td>Aiea, HI 96701</td>
<td>808/488-0599 Fax 808/488-2909</td>
</tr>
<tr>
<td>Beaver Equipment Specialty</td>
<td>845 - 106th Avenue, N.E.</td>
<td>Bellevue, WA 98004</td>
<td>425/451-3862 Fax 425/454-6531</td>
</tr>
<tr>
<td>D.C. Frost Associates, Inc.</td>
<td>2652 San Antonio Drive</td>
<td>Walnut Creek, CA 94598</td>
<td>925/947-6733 Fax 925/947-6784</td>
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<td>808/488-0599 Fax 808/488-2909</td>
</tr>
<tr>
<td>Coombs-Hopkins Company</td>
<td>5541 Avenida Encinas, Suite 250</td>
<td>Carlsbad, CA 92008</td>
<td>760/931-0555 Fax 760/931-9115</td>
</tr>
<tr>
<td>D.C. Frost Associates, Inc.</td>
<td>613 Taneytown Court</td>
<td>Walnut Creek, CA 94598</td>
<td>925/939-4494 Fax 925/939-4457</td>
</tr>
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