2026 WWTP IMPROVEMENTS

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

CAPITAL PROJECT #26WW13

September 25, 2026

CONTRACT DOCUMENTS

AND

SPECIFICATIONS

MAMMOTH COMMUNITY WATER DISTRICT

MAMMOTH LAKES, CALIFORNIA

MCWD Modified Short Form

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1 BIDDING REQUIREMENTS

1.1 Invitation to Bid

Sealed proposals will be received at the office of the Mammoth Community Water District, located at Mammoth Community Water District, 1315 Meridian Boulevard, Mammoth Lakes, CA 93546, until **3:00PM** local time on **Friday, October 16, 2026**, or such later date as may be set be addendum, and then will be publicly opened and read for the construction of the following public works project:

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

All questions will be submitted to Nick Holt via email at nholt@mcwd.dst.ca.us. All questions shall be submitted by **3:00PM** local time on **Friday, October 9, 2026**.

Mammoth Community Water District (MCWD) is seeking wastewater treatment plant contractors to install additional air diffusers and piping in aeration basins, replace isolation gates in aeration basins, rehabilitate concrete by crack sealing and surface coating, replace a secondary scum pipe, and install FRP weir troughs in a secondary clarifier. 3 isolation gates, 2 aeration grids comprising of approximately 360 diffusers and associated piping for 2 aeration grids, 520 linear feet of concrete joints and 1,380 square feet of concrete surfaces, 150 linear feet of FRP weirs and 27 trough supports, and 8 feet of 6" pipe will be installed or rehabilitated as described in the plans and specifications included as **Exhibits A and B**.

The contract documents for the Project, including the public works construction contract, instructions to bidders, bid forms, and plans and specifications, may be examined at the District office, with prior notice to the District's representative, located at **1315 Meridian Blvd., Mammoth Lakes, CA**, or online at www.mcwd.dst.ca.us. Bidders must comply with the Instructions to Bidders.

The District will hold a pre-bid conference at the District Headquarters, **1315 Meridian Blvd., Mammoth Lakes, CA**, on **Wednesday, October 7, 2026** at **2PM** local time. Walkthroughs to inspect the Primary Clarifier, Primary Effluent Channel, Aeration Basins, Secondary Clarifier, and Pipe Gallery will take place at the District Headquarters. It is suggested that each prospective bidder review the bid documents and project site prior to the pre-bid conference, and review the MCWD-provided materials for the project at the pre-bid conference. Attendance at the pre-bid conference is mandatory for a prospective bid to be considered responsive. On a case-by-case basis, the District may schedule an additional pre-bid conference if requested before **Thursday, October 8, 2025** at **4PM** local time.

Each Bid must be submitted on the prescribed forms and accompanied by cash, a cashier's check, certified check or bid bond executed on the prescribed form payable to the District in an amount not less than 10 percent of the amount bid.

The successful bidder will be required to furnish a payment bond and faithful performance bond each in the full amount of the Contract price, and insurance with certificates and endorsements of insurance, as provided in the Contract Documents. The

required bonds must be provided only by a surety insurer who is admitted to do business by and in good standing with the California Department of Insurance.

Bidders are hereby notified that in accordance with Public Contract Code section 22300, securities may be substituted for any monies that the District may withhold pursuant to the terms of this Contract to ensure performance.

The successful bidder must possess the following classification or type of contractor's license issued by the Contractors State License Board: **Class A California**.

To be qualified to bid on this Project, bidders must be registered and qualified to perform public work with the Department of Industrial Relations pursuant to section 1725.5 of the Labor Code. All subcontractors listed in a qualified bidder's bid as performing any portion of the work also must be registered and qualified with the Department of Industrial Relations.

To qualify to bid on this Project, bidders must submit to the District copies of valid Certificates of Reported Compliance, as described in section 2449(n) of Title 13 of the California Code of Regulations, for the fleet selected to perform such work proposed in the bid. If applicable, subcontractors must submit copies of valid Certificates of Reported Compliance, as well. If a bidder does not submit the necessary Certificates of Reported Compliance with their bid, the bid will be disqualified.

Bids that equal or exceed $1,000,000 must be accompanied by an Iran Contracting Act certification in the form provided in section 1.9.

The District's General Manager has determined that the Project involves work that is substantially complex and therefore requires the District to retain a higher percentage of proceeds from each payment to the Contractor in order to adequately protect the public against potential claims and losses that might result from such work. Based on the above finding, the District has imposed a retention of proceeds under this Contract equal to **five percent (5%)** of the amount of each approved payment requested by the Contractor.

The attention of bidders is directed to the requirements and conditions of employment to be observed and prevailing wage rates to be paid to all workers employed under the Contract in accordance with Labor Code sections 1770 and following. Copies of the prevailing rate of per diem wages are on file at the District's office, and will be made available to any interested party on request. In accordance with Labor Code section 1771.4(a)(1), this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The District reserves the right to reject all bids. Any bid not conforming to the intent and purpose of the Contract Documents may be rejected. The District may extend the time to award the Contract.

Dated: 9/25/26

Mammoth Community Water District

By: _____

Nick Holt, PE
Associate Engineer

1.2 Bid

TO: Mammoth Community Water District, 1315 Meridian Boulevard, Mammoth Lakes, CA 93546

The undersigned states and declares as follows:

That the Bidder has carefully examined the location of the proposed work; that the Bidder has examined the Contract Documents entitled: Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement; the Addenda Numbers ___ to ___, if any; that the Bidder has read the accompanying Short Form Public Works Contract (Section 2); that the Bidder hereby proposes to begin work and complete the project in accordance with the schedule and deadlines in the Contract Documents; that the Bidder hereby proposes to furnish all labor, materials, tools, and equipment, and to perform all work required, complete in place, in compliance with all terms and conditions and requirements of all Contract Documents; and that the Bidder will take in full payment for the work the prices set forth in the accompanying bid schedule.

The Bidder acknowledges that the following quantities are approximate only, being given as a basis for the comparison of proposals, that the District does not expressly or by implication agree that the actual amount of the work will correspond therewith, and that the District reserves the right to increase or decrease the amount of any class or portion of the work, as may be deemed necessary or advisable by the Engineer.

The following surety or sureties have agreed to furnish payment and faithful performance bonds to the Bidder if it is awarded the contract:

Name of Performance Bond Surety: _____

Name of Payment Bond Surety: _____

Bidder Information

Bidder Name: _____

Type of Business Entity and State of Incorporation (e.g., corporation, limited liability company, partnership): _____

Contractor's License No.: _____

DIR Public Works Contractor Registration No.: _____

Expiration Date: _____

Type of license: _____

Name under which license is held: _____

Status of license: _____

The Bidder's authorized officer identified below hereby declares that the representations in this Bid are true and correct and of my own personal knowledge, and that these representations are made under penalty of perjury under the laws of the State of California.

Authorized Signature: _____

Printed Name: _____

Title: _____

Date: _____

Address: _____

_____

Phone:_____

Fax: _____

Email: _____

1.3 Bid Schedule

Item	Description	Quantity*	Units	Unit Price	Amount
1	Mobilization	1	Lump		$_____
2	Aeration Basin Slide Gate Replacement	2	Ea		$_____
3	Aeration Basin Butterfly Gate Installation	1	Ea		
4	Aeration Basin Diffuser Grid Installation	2	Ea		$_____
5	Concrete Crack Sealing	520	LF		$_____
6	Concrete Surface Sealing	1,400	SF		$_____
7	Secondary Clarifier Weir Installation	1	Lump		$_____
8	Secondary Clarifier Weir Bid Alternate: New Anchor Bolt Installation	1	Ea		$_____
9	Secondary Clarifier Scum Pipe Replacement	1	Lump		$_____
10	Primary Clarifier Dewatering	1	Lump		$_____
11	Primary Effluent Transfers, Bypasses, and Temporary Coffer Dams	1	Lump		$_____
12	Aeration Basin Mixed Liquor Transfers, Bypasses, Dewatering, and Temporary Coffer Dams	1	Lump		$_____
				Grand Total:	$_____

* Items described include all labor, equipment, tools, materials with the exceptions of aeration basin ceramic disc diffusers and secondary weir troughs and support arms, and tasks of work needed to complete removal of existing equipment listed for disposal, new equipment installation, and concrete rehabilitation as described in these Specifications.

** Above prices include any amount payable by the Owner for taxes by reason of this contract.

Acknowledge Addenda

Addendum #:_____ Signed: _____

Addendum #:_____ Signed: _____

Addendum #:_____ Signed: _____

Addendum #:_____ Signed: _____

1.4 **Designation of Subcontractors**

In compliance with Public Contract Code section 4100 et. seq. each bidder shall set forth below the: (a) name, location of the mill, shop, or office, and California contractor's license number of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work or improvement to be performed under these specifications in excess of one-half of 1% of the Contractor's total bid, (b) description of the type of work to be performed by each such subcontractor, and (c) portion of the work (expressed in dollar amount) that will be performed by each such subcontractor.

If the Contractor fails to specify a subcontractor for any portion of the work to be performed under the Contract, it shall be deemed to have agreed to perform such portion itself, and it shall not be permitted to subcontract that portion of the work except under the conditions hereinafter set forth.

Subletting or subcontracting of any portion of the work in excess of one-half of 1% of the Contractor's total bid as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after making a written finding as a public record of the District setting forth the facts constituting the emergency or necessity.

Subcontractor (name, address, Subcontractor's CSLB License Number, Subcontractor's DIR Public Works Contractor Registration Number)	Description of Subcontractor Work	Portion of Work ($)

Additional pages attached: _____

1.5 Bid Bond

KNOW BY ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED _____, Contractor or Principal; and _____, as Surety, are hereby held and bound unto Mammoth Community Water District, hereinafter called the District, in the sum of $_____, which sum is equal to at least ten percent of the total amount of the Bid, payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the District a certain Bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing, for the construction of the following public works project:

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Community Water District (MCWD) is seeking wastewater treatment plant contractors to install additional air diffusers and piping in aeration basins, replace isolation gates in aeration basins, rehabilitate concrete by crack sealing and surface coating, replace a secondary scum pipe, and install FRP weir troughs in a secondary clarifier. 3 isolation gates, approximately 360 diffusers and associated piping for 2 aeration grids, 520 linear feet of concrete joints and 1,475 square feet of concrete surfaces, 150 linear feet of FRP weirs and 27 trough supports, and 8 feet of 6" pipe will be installed or rehabilitated. NOW, THEREFORE,

(a) If the Bid is rejected, or in the alternate,

(b) If the Bid is accepted and the Principal shall sign and deliver a Contract, in the form of the Contract attached hereto and shall execute and deliver Performance and Payment Bonds in the forms attached hereto and shall deliver proof of insurance (all completed in accordance with the Contract Documents), and shall in all other respects perform the agreement created by the acceptance of the Bid;

Then, this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all default of the Principal hereunder shall be the amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the District may accept such Bid, and said Surety does hereby waive notice of any such extension.

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

For Contractor or Principal

_____

Name: _____

Title: _____

For Surety:

_____

Name: _____

Title: _____

(Seal)

1.6 **Experience Qualification**

The Bidder has been engaged in the contracting business, under the present business name for _____ years. Experience in work of a nature similar to that covered in the Bid extends over a period of _____ years.

The Bidder, as a contractor, has never failed to satisfactorily complete a contract awarded to it, except as follows:

_____

_____

_____

_____

The following contracts have been satisfactorily completed in the last three years for the persons, firm or entity indicated:

Year	Owner	Type of Work	Contract Amount

The following is a list of plant and equipment owned by the Bidder, which is definitely available for use on the proposed work as required.

Quantity	Name, Type, and Capacity	Condition	Location

Please select one of the following:

- ❑ The proposed equipment includes Off-Road Diesel Vehicles. The Contractor's required California Air Resources Board (CARB) Certificates of Reported Compliance documentation is attached, per section 2.7 of the Short Form Public Works Contract (section 2).
- ❑ The proposed equipment does not include CARB Off-Road Diesel Vehicles.

Executed on _____, at _____, _____

BIDDER

Company Name: _____

Authorized Signature: _____

Printed Name: _____

Title: _____

1.7 Noncollusion Declaration to be Executed by Bidder and Submitted with Bid

(Public Contract Code Section 7106)

The undersigned declares:

I am the _____ (Title) of _____ (Bidder), the party making the foregoing bid.

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

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

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

Authorized Signature: _____

Printed Name: _____

1.8 Acknowledgement of Insurance and Bonding Requirements

By signing below Bidder acknowledges the insurance requirements as listed in Short Form Public Works Contract (section 2), section 2.33 "Insurance". By this acknowledgement, the Bidder and its insurance provider(s) and surety(ies) certify that they have read and understand the insurance and bonding requirements in their entirety, including limits of coverage, additional insureds and endorsements, and bonding requirements, and that the Bidder can provide the insurance coverage and bonds as required in the Contract documents without exception.

Bidder understands that if the insurance coverage provided in section 2.33 of the Short Form Public Works Contract (section 2) and the Contract Bonds cannot be provided, its bid is subject to rejection by the District as non-responsive.

BIDDER

Company Name: _____

Authorized Signature: _____

Printed Name: _____

Title: _____

Date: _____

SURETY PROVIDER/SURETY REPRESENTATIVE

Surety Name: _____

Authorized Signature: _____

Printed Name: _____

Title: _____

Date: _____

Bidder Must Provide This Acknowledgment for Each Insurer or Surety Providing Insurance Coverage or a Bond under this Contract

1.9 Iran Contracting Act Certification

Pursuant to Public Contract Code (PCC) section 2204, the following Iran Contracting Act certification is required if your bid totals $1,000,000 or more.

If your bid totals $1,000,000 or more, you must complete only one of the following two paragraphs. To complete paragraph 1, check the corresponding box and complete the certification. To complete paragraph 2, simply check the corresponding box.

☐ 1. We are not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services (DGS) pursuant to PCC 2203(b), and we are not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on

_____ (date),

at _____ (city), _____ (state).

_____ (signature)

_____ (printed name)

OR

☐ 2. We have received written permission from the District to submit a bid pursuant to PCC 2203(c) or (d). A copy of the written permission from the District is included with our bid.

2 MAMMOTH COMMUNITY WATER DISTRICT SHORT FORM PUBLIC WORKS CONSTRUCTION CONTRACT

Name of Project	**Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement**
Contractor Name, Address and Capacity (e.g., corporation, partnership)	
List and Title of Contract Exhibits	Exhibit A Technical Specifications Exhibit B Demolition and Construction Plans Exhibit C Xypex Concrete Rehabilitation Specifications Exhibit D Sanitaire Aeration Grid Specifications Exhibit E Secondary Weir Trough Shop Drawings Exhibit F Waterman Slide and Butterfly Gate Specifications Exhibit G Original Wastewater Treatment Plant Plans
Type of Required California Contractor's License Classification	**Class A**
Total Contract Price	$ _____ (Per Bid Schedule*)
Daily Liquidated Damages Amount (insert zero if none)	$0
District Representative Name, Title, and Address	Nick Holt, Associate Engineer 1315 Meridian Blvd. Mammoth Lakes, CA 93546
Date of Contract	

*Will be attached to executed contract.

This contract is made by and between Mammoth Community Water District and the Contractor named above, who agrees as follows:

SAMPLE

2.1 Scope of Work

This Public Works Construction Contract, the Contract exhibit(s) listed above, approved Change Orders, and, if applicable, the notice inviting bids, addenda, Contractor's bid and bid forms constitute the "Contract" between the parties. For purposes of this Contract, the "Work" shall mean the scope of work as described in the exhibit(s).

2.2 Time of Completion

The work shall be complete no later than December 1, 2026. The parties agree that time is of the essence for the performance of this Contract.

2.3 Contractor's Performance

Contractor shall construct, install, perform and do the Work, and shall furnish, provide and pay for all labor, equipment, materials, tools, supplies, transportation, permits, sales and taxes, and shop drawings necessary or appropriate to complete the Work. Contractor shall perform in the Work in a good and workmanlike manner, and such Work shall be done to the approval and satisfaction of District.

2.4 Contract Price and Payments

(a) If Contractor performs the Work in accordance with this Contract and to the satisfaction of District, District shall pay Contractor in the amount and manner as set forth in the Bid Schedule; however, the total Contract price shall not exceed the sum stated above, unless otherwise agreed to in writing by the District. No payment, including all progress payments and the final payment, shall be made to Contractor in excess of 95% of the percentage of Work actually completed plus a like percentage of the value of material delivered on the ground or stored subject to, or under control of, District. The five percent not paid shall be withheld by District until final completion and acceptance of the Work. However, in lieu of withholding of money, and in accordance with the provisions of California Public Contract Code section 22300, Contractor may substitute securities to ensure performance under the Contract.

(b) If payment is to be made by progress payments, then, in accordance with California Public Contract Code section 20104.50, a written payment request from Contractor shall be reviewed by District as soon as practicable in order to determine whether it is proper. If District determines it not to be a proper payment request suitable for payment, then District shall return it to Contractor with a written explanation of the deficiencies as soon as practicable, but not later than seven days after receipt of the payment request. If District determines the payment request to be properly submitted and undisputed, the District shall make the payment to Contractor within 30 days after receipt of the payment request. If District does not pay a properly submitted and undisputed payment request within this 3-day period, then District shall pay interest on the overdue amount to Contractor at the legal rate set forth at California Code of Civil Procedure section 685.010. This subsection shall not apply if District funds are not available for payment of the payment request or if payment is delayed due to an audit inquiry by the financial officer of District.

SAMPLE

(c) No progress or final payment shall be considered or construed to be an approval or acceptance of any Work, materials or equipment, or a waiver of any breach or default. Estimated amounts and values of Work done and materials and equipment incorporated into the Work will be conformed with actual amounts and values as they become available in subsequent progress payments and the final payment. All payments will be subject to correction in subsequent progress payments and the final payment.

2.5 Compliance with Laws

Contractor shall give all notices and comply with all federal, state and local laws, statutes, regulations and ordinances applicable to the performance of the Work. Contractor is responsible for the safety of its workers and Contractor shall comply with, and require its workers to comply with, all applicable federal and state worker and job site safety-related laws and regulations, including, but not limited to, applicable federal Department of Labor, Occupational Safety and Health Administration ("OSHA") regulations and California Department of Industrial Relations (including the Division of Occupational Safety and Health and Occupational Safety and Health Standards Board ("Cal/OSHA")) regulations and safety orders. Contractor shall promptly notify District's Representative in writing of any specification at variance therewith and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to District's Representative, it shall bear all costs arising therefrom.

2.6 Permits and Licenses

Permits, licenses, and easements necessary for the performance of the Work shall be obtained and paid for by Contractor, unless otherwise provided in the exhibit(s). Contractor must hold the current and valid type of California contractor's license classification described above for the duration of the Work.

2.7 Certificates of Reported Compliance

This Contract is subject to the California Air Resources Board Off-Road Diesel Regulation (Title 13 CCR § 2449). In order to be eligible to perform the Work under this Contract, Contractor must submit to District copies of valid Certificates of Reported Compliance, as described in section 2449(n), for the fleet selected to perform work under this Contract. If applicable, subcontractors must submit copies of valid Certificates of Reported Compliance, as well. If Contractor does not provide said Certificates, Contractor may not perform work under this Contract.

The California Air Resources Board Off-Road Diesel Regulation applies to all self-propelled offroad diesel vehicles with 25 horsepower or greater and most two-engine vehicles (except on-road two-engine sweepers). This includes vehicles that are rented or leased (rental or leased fleets).

2.8 Bonds

Promptly upon execution of this Contract and prior to the commencement of any Work, Contractor shall obtain at its sole cost and expense and provide to District a

SAMPLE

performance bond and payment bond each in the amount of 100% of the amount of this Contract. The bonds must be issued by a surety admitted in California and be in a form acceptable to District. The bonds must comply with California Civil Code section 9550 and 9554 and applicable provisions of the California Bond and Undertaking Law (Code Civ. Proc. § 995.010 et. seq.).

2.9 Authority of District and District's Representative

(a) The District's representative listed above is the representative of the District for purposes of this Contract and has full authority to interpret the Contract, to conduct the construction review and inspection of Contractor's performance, and to decide questions which arise during the course of the Work. His/her decisions on these matters shall be final and conclusive. District's Representative has the authority to reject all Work and materials which do not conform to the Contract, and has the authority to stop the Work whenever such stoppage may be necessary to ensure the proper execution of the Contract. District's Representative's right and authority is limited to rejection of unsatisfactory Work or methods. District and the District's Representative do not bear any responsibility for Contractor's safety practices or procedures. Any order given by District's Representative, not otherwise required by the Contract to be in writing shall, on request of Contractor, be given or confirmed by District's Representative in writing. Whenever Work, methods of procedure, or any other matters are made subject to direction or approval of District, such direction or approval will be given by District's Representative.

(b) Except as provided elsewhere in the Contract, neither District nor District's Representative will be responsible for or have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work. Except as provided elsewhere in the Contract, neither District nor District's representative will be responsible for or have control or charge over the acts or omissions of Contractor, or any of their subcontractors, agents or employees, or any other persons performing any of the Work. Any general control of the Work exercised by the District or its authorized representatives shall not make Contractor an agent of District, and the liability of Contractor for all damages to persons and/or to public or private property arising from Contractor's execution of the Work shall not be lessened because of such general control.

2.10 Contractor's Understanding

Contractor acknowledges that it has, by careful investigation and inspection, satisfied itself as to the nature and location of the job site; the ground, character, quality and quantity of the materials and conditions to be encountered, including subsoil conditions, if applicable; the character and amount of labor, equipment, supplies and materials needed preliminary to and during the performance of the Work; and all other matters which can in any way affect the Work under this Contract. Contractor further acknowledges that neither District nor District's Representative have made any representations whatsoever concerning job site conditions, except for such representations that may have been made in writing in this Contract.

SAMPLE

2.11 Subcontractors

All subcontractors and suppliers engaged in work will be considered as employees of Contractor, and Contractor shall be held responsible for their work, which shall be subject to the provisions of the Contract. Contractor will provide the following information (a) the name and the location of the place of business, and California contractor's license number of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work or improvement, and of each subcontractor who, under subcontract to Contractor, is to specifically fabricate and install or provide a portion of the work or improvement according to the Contract, in any amount in excess of ½ of 1 percent of the Contract amount. Contractor shall ensure that all subcontractors employed on the work comply with all applicable laws and regulations, including payment of prevailing wages, employment of apprentices, and preparation and submission of accurate and complete payrolls. Contractor shall be fully responsible to District for the acts or omissions of its subcontractors and of the persons either directly or indirectly employed by them. Nothing contained in this Contract shall create any contractual relationship between any subcontractor and District. Each subcontract shall contain a suitable provision for the suspension or termination thereof with or without cause. If a legal action, including arbitration and litigation, against District is initiated by a subcontractor or supplier, Contractor shall reimburse District for the amount of legal, engineering and all other expenses incurred by District in defending itself in said action. District and District's Representative reserve the right to approve all subcontractors.

Contractor shall not utilize, or allow work by, any subcontractor who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code section 1777.1 or 1777.7. (See California Public Contract Code section 6109.) The California Division of Labor Standards Enforcement publishes a list of debarred contractors and subcontractors on the Internet at www.dir.ca.gov/DLSE/debar.html.

2.12 Changes in the Work

District may, at any time, by written change order make changes in the Work, or extend the time to complete the Work, as deemed necessary by District. If such changes cause an increase or decrease in Contractor's cost of, or time required for, performance of the Contract, there shall be an equitable adjustment in the Contract price. The price adjustment shall be determined by one of the following methods in the order of precedence listed:

(a) Based on the unit prices contained in the Bid Schedule.

(b) Mutually agreed-upon lump sum or unit price adjustment.

(c) Contractor's actual cost of labor (wages and benefits), materials (actual purchase price, sales tax, freight & delivery) and equipment/tools (at actual or fair/prevailing rental rates) directly engaged in the performance of the extra work plus 15% mark-up for overhead and profit. For price adjustments under this section, Contractor shall provide to District an itemized breakdown of the quantities and prices used in the extra work, and it shall make available all source documents, including payroll records, invoices, purchase orders, contracts and lease agreements.

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2.13 Guarantee

(a) Contractor unconditionally guarantees all materials and workmanship furnished under this Contract, and agrees to replace at its sole cost and expense, and to the satisfaction of District, any and all materials which may be defective or improperly installed. Contractor shall repair or replace to the satisfaction of District any or all such Work that may prove defective in workmanship or materials, ordinary wear and tear excepted, together with any other Work which may be damaged or displaced in so doing. This guarantee shall remain in effect for one year from the date of District's acceptance of the Work. The District shall have the right to call for inspection or inspections of the work before the end of the one-year guarantee period and Contractor shall attend and participate in such inspection(s) upon request of District. This guarantee does not excuse Contractor for any other liability related to defective Work discovered after the guarantee period. Contractor shall transfer to District all manufacturer and supplier warranties relating to the Work, if any, upon completion of the Work and prior to final payment. Any products/completed operations insurance coverage shall be maintained after completion of the project for the full guarantee period.

(b) In the event of failure to comply with the above stated conditions within a reasonable time, District may have the defect repaired and made good at the expense of Contractor, which shall pay the costs and charges for such repair immediately upon demand, including any reasonable management and administrative costs, and engineering, legal and other consultant fees incurred by District in enforcing this guarantee.

2.14 Suspension of Work

District may suspend the Work wholly or in part, for such period as District may deem necessary, due to unsuitable weather or to any other conditions District considers unfavorable for the suitable performance of the Work, including the improper performance of the Work by Contractor. Contractor shall immediately comply with such written order of District to suspend the Work wholly or in part and shall be paid for the Work performed to the date of suspension, except for improperly performed Work. The suspended Work shall be resumed only when ordered by District.

2.15 Termination

(a) This Contract may be terminated with or without cause at any time by District by giving 10 days' advance written notice to Contractor. In the event of such termination, Contractor shall be compensated for actual Work performed to the date of termination as calculated by District based on the Contract price and payment provisions above.

(b) If District terminates the Contract because of Contractor's failure to do the Work with such diligence as will ensure the completion of the Work within the time specified in the Contract, then District may take over the Work and pursue the same to completion by using another contractor or any other method District deems expedient. In this event, District may also take possession and control of, and utilize in completing the Work, any and all materials, supplies, tools and equipment delivered to the site of the Work by Contractor or by its suppliers or subcontractors. The materials, supplies, tools and equipment remaining after completion of the Work shall be returned to Contractor.

SAMPLE

2.16 Prevailing Wages

Contractor agrees to pay all workers employed on this Work not less than the general prevailing rate of per diem wages for Work of a similar character in the locality of District, and not less than the general rate of per diem wages for holiday and overtime work, as established pursuant to the California Labor Code (in particular sections 1770-1780) and applicable regulations and orders. A copy of the applicable prevailing rate of per diem wages is available to the contractor at the administrative offices of District. Contractor shall obtain and post a copy of such prevailing wage rates at the job site. Contractor shall also comply with the provisions of California Labor Code section 1775, including provisions which require Contractor to (a) forfeit as penalty to District not more than $200 for each calendar day or portion thereof for each worker (whether employed by Contractor or any subcontractor) paid less than the applicable prevailing wage rates for any work done under this Contract in violation of the provisions of the California Labor Code, and (b) pay to each worker the difference between the prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which said worker was paid less than the prevailing wage.

2.17 Labor Nondiscrimination

In accordance with California Labor Code section 1735, throughout the performance of the Contract, Contractor and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age (over 40), or sexual orientation (as those discrimination bases are defined in California Government Code sections 12926 and 12926.1) of such persons, except as provided in California Government Code section 12940. Any contractor violating this nondiscrimination provision shall be subject to penalties that may be imposed pursuant to Division 2, Part 7, Chapter 1 of the California Labor Code.

2.18 Eight-Hour Day Limitation

(a) Contractor agrees that 8 hours labor shall constitute a day's work, and no worker, in the employ of the Contractor, or any subcontractor, doing or contracting to do any part of the Work under this Contract, shall be required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week; provided that subject to California Labor Code section 1815, a worker may perform work in excess of 8 hours per day or 40 hours per week at not less than one and one-half times the basic rate of pay.

(b) Except as provided above for overtime, Contractor shall forfeit as a penalty to District the sum of $25 for each worker employed in the execution of this Contract by it or by any subcontractor under it for each calendar day during which such worker is required or permitted to Work more than 8 hours in any one day and 40 hours in any one calendar week in violation of California Labor Code sections 1810 through 1815.

2.19 Payroll Records

Contractor and each subcontractor shall keep an accurate payroll record showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman,

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apprentice, worker, or other employee employed in connection with the Work, and shall make such payroll record available for inspection, in accordance with the requirements of California Labor Code section 1776. Contractor shall be responsible to ensure compliance with section 1776. Failure to comply with that section may result in the Labor Commissioner's assessment of a penalty of $100 per day per worker.

2.20 Employment of Apprentices

Contractor shall comply with, and take such actions as necessary to effectuate, the apprentice employment requirements as set forth at California Labor Code sections 1777.5, 1777.6 and 1777.7.

2.21 Character of Worker

If any employee of Contractor or any of its subcontractors shall be incompetent or act in a disorderly or improper manner, such employee or subcontractor shall be removed from the Work immediately, and such person or subcontractor shall not again be employed on the Work. Such discharge shall not be the basis for any claim for compensation or damages against District, or any of its officers or agents.

2.22 Superintendence

Contractor shall designate in writing before starting Work an individual as authorized representatives who shall have the authority to represent and act for Contractor. This authorized representative shall be present at the Work site at all times while Work is actually in progress. When Work is not in progress and during periods of Work suspension, arrangements acceptable to District's Representative shall be made for any emergency work that may be required.

2.23 Inspection and Testing of Work

(a) Unless otherwise provided, all equipment, supplies, materials, and Work shall be subject to inspection and testing by District's Representative. District's Representative will observe the progress and quality of the Work and determine, in general, if the Work is proceeding in accordance with the Contract. District's Representative shall not be required to make comprehensive or continuous inspections to check the quality of the Work, and he or she shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work. Observations, inspections or testing by District's Representative shall not relieve Contractor of its obligation to conduct comprehensive inspections of the Work and to furnish proper materials, labor, equipment and tools, and perform acceptable Work, and to provide adequate safety precautions, in conformity with the Contract.

(b) Contractor shall provide access to District's Representative and other agents of District, and agents of the federal, state, or local governments at all reasonable hours for inspection and testing to ascertain compliance with the Contract and applicable laws and regulations. Contractor shall cooperate in providing such access, and shall, upon request by District's Representative, promptly provide safe and convenient facilities, labor and

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materials reasonably needed by District's Representative for performing all inspections and tests.

(c) If, after any inspection or testing by District's Representative, District finds any of the Work to be unacceptable, defective or nonconforming, then Contractor at its sole cost and expense shall replace or repair the Work to the satisfaction of District's Representative. If any Work required to be tested or inspected was installed, covered, or buried without inspection or testing, then, upon request by District's Representative, Contractor shall at its sole cost and expense remove or uncover the Work such that it may be inspected or tested, and replace the Work after completion of the inspection or testing. Upon failure of Contractor to comply with any order of District's Representative made under this section, District may cause the unacceptable, defective or nonconforming Work to be remedied, removed, or replaced, and may deduct the costs therefor from any monies due or to become due Contractor.

2.24 Trade Names and Alternatives

For convenience in designation in the Contract, certain articles or materials to be incorporated in the Work may be designated under a trade name or the name of a manufacturer. The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, so long as Contractor shows to the satisfaction of District's Representative that the acceptable quality and suitability of the alternative(s).

2.25 Protection of Work and Safety

(a) Contractor shall be responsible for the care of all Work until its completion and final acceptance by District; and it shall at its own expense replace damaged or lost materials or supplies and repair damaged parts of the Work.

(b) District's Representative's construction review and inspection of Contractor's performance shall not include any review of the adequacy of Contractor's work methods, equipment, bracing or scaffolding or safety measures, in, on, or near the job site.

(c) Contractor shall be solely and completely responsible for the conditions of the job site, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety procedures and practices shall conform to all applicable federal, state, and local laws, ordinances, and codes. Contractor shall carefully instruct all personnel as to potential dangers and shall provide such necessary safety equipment and instruction as may be necessary to prevent injury to personnel and damage to property. Contractor shall provide and maintain, in accordance with California Labor Code section 6708, OSHA and Cal/OHSA requirements, adequate emergency first aid treatment for its employees and anyone else who may be injured in connection with the work.

(d) Contractor shall have an Injury/Illness Prevention Program (IIPP) in place to protect the safety of its employees and ensure that its subcontractors also have an IIPP or comply with Contractor's program. The Contractor's IIPP shall comply with and be at least as effective as the requirements of section 3203 of Title 8 of the California Code of

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Regulations. The Contractor and subcontractors must implement all requirements of and Injury and Illness Prevention Program regulation, unless they can demonstrate that they are exempt from certain specific provisions in the regulation. The Contractor shall submit a copy of its IIPP to the District prior to any work being performed on District property.

(e) If the Work includes the construction, alteration, improvement, or maintenance of electric power generation, control transformation, transmission or distribution lines or equipment within the meaning of Code of Federal Regulations title 29, section 1910.269 or 1926.950, then the Contractor will implement and comply with the requirements of the "contract employer" as described and set forth in section 1910.269 and 1926.950, including, but not limited to, the obligations to properly train the Contractor workers on safety-related work practices and procedures, exchange information with the District concerning unique hazardous conditions presented by the Work, instruct the Contractor workers about the hazardous conditions relevant to the Work, and coordinate with the District on safety-related work rules and procedures. The Contractor also shall be responsible for transmitting safety-related information under sections 1910.269 and 1926.950 with any subcontractors retained by it to perform electrical-related Work under the Contract.

2.26 **Protection of Public and Property**

(a) Contractor shall take all necessary or appropriate precautions to prevent damage to all existing improvement, including above ground and underground utilities, pipelines, conduits, trees, shrubbery, fences, signs, mailboxes, driveways, sidewalks, gutters, streets, parking lots or other pavement, levees or embankments, survey markers and monuments, buildings, structures, District's property, adjacent property, and any other improvements or facilities within or adjacent to the job site. If any such improvement or property damaged or destroyed by reason of Contractor's operations, it shall be replaced or restored, at Contractor's sole cost and expense, to a condition at least as good as that prior to the start of Contractor's performance under this Contract.

(b) Contractor shall adopt all practical means to minimize interference to traffic and public inconvenience, discomfort or damage from the Work. All obstructions to traffic shall be guarded by barriers illuminated at night. For any Work on, adjacent to, or interfering with any street, the conditions and limitations applicable to such Work shall be determined by those public agencies or other entities responsible for maintenance of the affected street. Contractor shall determine the nature and extent of all such requirements, and shall comply with all permit and other requirements. As required at any street crossing, Contractor shall provide all necessary flag persons, guardrails, barricades, signals, warning signs and lighting to provide for the safety of existing roads and detours. Immediately after the need for temporary detours ceases, or when directed, Contractor shall remove such detours and perform all necessary cleanup work, including replacement of fences, removal of pavement, necessary replacement of existing roadway appurtenances, grading, soil stabilization and dust control measures.

2.27 **Clean-Up**

During the progress of the Work, Contractor shall maintain the job site and related structures, grounds and equipment in a clean, orderly condition and free from unsightly accumulation of rubbish. Upon completion of Work and before final payment, Contractor

SAMPLE

shall at its own cost and expense clean-up and remove from the vicinity of the Work all rubbish, debris, trash, unused materials and supplies, concrete forms, and temporary bridging and other like materials, belonging to it or used under its direction during the construction of the Work. Where the construction has cross yards or driveways, they shall be restored by Contractor to the complete satisfaction of District's Representative, at Contractor's sole expense.

2.28 **Water Pollution**

Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, and canals from pollution with fuels, oils bitumens, calcium chloride, and other harmful materials and shall conduct and schedule its operations so as to avoid or minimize muddying and silting of said streams, lakes, reservoirs, and canals. Care shall be exercised to preserve vegetation beyond the limits of construction. Contractor shall comply with California Fish and Game Code section 5650 and all other applicable statutes and regulations relating to the prevention and abatement of water pollution. If the Work is subject to the NPDES general permit for stormwater discharges from construction activities, Contractor will comply with all terms and conditions of any applicable special condition, specification or addendum issued by District related to implementation of the Storm Water Pollution Prevention Plan for the Work.

2.29 **Underground Work**

If the Work includes excavation and/or trenching deeper than four feet underground, then the following provisions shall apply:

(a) Protection of Underground Utilities. Prior to conducting any excavation or trenching, Contractor shall contact the appropriate regional notification center as required by California Government Code sections 4216 and following. In accordance with California Government Code section 4215, District shall be responsible for the timely removal, relocation or protection of existing main or trunkline utility facilities located on the project site and not shown on the plans and drawings. Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating existing main or trunkline utility facilities not indicated on the plans and drawings with reasonable accuracy, and for the equipment on the project necessarily idled during such work; provided that Contractor shall first notify District before commencing work on locating, repairing damage to, removing or relocating the utilities. Contractor shall not be assessed liquidated damages for delay in completion of the project, when the delay was caused by the failure of District or the owner of the utility to provide for removal or relocation of the utility facilities not shown on the plans and drawings.

(b) Sheeting and Shoring Plan. If the total amount of the Contract exceeds $25,000 and the Work involves the excavation of any trench or trenches five feet or more in depth, then, in accordance with California Labor Code section 6705, Contractor shall submit to District for acceptance, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any such trench or trenches. The plan shall comply with applicable United States Department of Labor regulations (29 C.F.R. 1926) and OSHA and Cal/OSHA construction safety orders and shoring system standards or be

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prepared by a registered civil or structural engineer who certifies that the plan is not less effective than the shoring, bracing, sloping, or other provisions of the construction safety orders and shoring system standards.

(c) Unusual Underground Conditions. In accordance with California Public Contract Code section 7104, the following provisions shall apply to any work that involves digging trenches or other excavations:

(i) If, during any such digging or excavation, Contractor discovers (a) material Contractor believes may be material that is hazardous waste, as defined in California Health & Safety Code section 25117, that is required to be removed to a Class I, II, or III disposal site, (b) subsurface or latent physical conditions at the site differing from those indicated, or (c) 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 in the Contract, then Contractor shall promptly notify District's Representative in writing and shall not disturb the area of the subject digging or excavation until notified by District's Representative.

(ii) Upon receipt of any notice pursuant to the foregoing subsection, District's Representative shall promptly investigate the conditions, and if he or she finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of the Work, or any part of the Work, it shall issue a change order pursuant to this Contract.

(iii) If there is a dispute between District and Contractor over whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in Contractor's cost of, or time required for, performance of any part of the Work, Contractor shall not be excused for the scheduled completion date, but shall proceed with all work to be performed under the Contract. Contractor shall remain any and all rights provided by this Contract or by law that pertain to the resolution of disputes and protests between the parties.

2.30 Hazardous Materials; Hazard Communication

(a) Proposition 65 and the California Health and Safety Code require businesses to provide warnings prior to exposing individuals to materials listed by the Governor as chemicals "known to cause cancer or reproductive toxicity." District may use chemicals on the Governor's list at many of its facilities. In addition, many of these chemicals are present at non-District-owned facilities and locations. Accordingly, in performing the Work under this Contract, Contractor, its employees, agents, and subcontractors may be exposed to chemicals on the Governor's list. Except as provided in subsection (b), Contractor is responsible for notifying its employees, agents, and subcontractors that work performed hereunder may result in exposures to chemicals on the Governor's list.

(b) Before starting work, Contractor shall have a written Hazard Communication Program ("HCP") in place that complies with the requirements of section 5194 of Title 8 of the California Code of Regulations, including the requirements of 8 C.C.R. section 5194(e). The information in Contractor's HCP must include the methods by which Contractor shall communicate to District which hazardous substances it will use and store on the job site(s) to which District's and Contractor's employees and subcontractors may be exposed.

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Contractor shall submit its HCP to District at the same time as submittal of its initial project schedules or other time designated by District. Contractor will provide copies of safety data sheets ("SDS") for all hazardous substances brought onto and used or stored on the job site(s). Contractor also will ensure that all hazardous substances are marked with Proposition 65 and any other visible warning labels as required by law. Whenever possible, Contractor shall provide SDS for all hazardous substances to District prior to brining a hazardous substance onto a job site, but will provide all SDS by no later than the time the hazardous substance is physically brought onto the site. District will communicate Contractor's HCP and SDS information to District's employees who work on or will enter the job site. District will provide Contractor with a copy of District's HCP and SDS information specific to District operations on the job site. Contractor shall, in turn, convey this information to its employees and subcontractors. During the course of the work, Contractor will keep copies of both its and District's HCP, SDS and other relevant information at Contractor's job site office.

2.31 **Contractor's License Notice**

Statement required by California Business & Professions Code section 7030: "Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within 10 years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826."

2.32 **Indemnification**

To the fullest extent permitted by law, Contractor shall protect, defend, indemnify and hold harmless District and, if applicable, District's Representative, and their respective officers, directors, agents, employees, volunteers, representatives, boards, and consultants from and against all penalties and fines imposed by law and all loss, claim, cause of action, demand, suit, judgment, cost, damage, expense, and liability (including but not limited to court or arbitration costs and reasonable attorneys' and expert witness fees) resulting from injury to or death of persons, including without limitation employees of the District, District's Representative and Contractor, or damage to or loss of property, caused by, arising out of or in any way connected with the Contractor's or its subcontractors' or suppliers' performance, operations or activities under this Contract, except to the extent the sole negligence, active negligence or willful misconduct of an indemnified party proximately causes the loss, claim, demand, cost, suit, judgment, penalty, fine, cause of action, damage, expense, or liability.

(a) Contractor's duty to defend is a separate and distinct obligation from Contractor's duty to indemnify. Upon the request of an indemnified party hereunder, Contractor shall defend any suit asserting a claim covered by this indemnity and shall pay any costs and expenses that may be incurred by an indemnified party in enforcing this indemnity. Contractor shall defend any suit asserting a claim covered by this indemnity and shall pay any costs and expenses that may be incurred by an indemnified party in enforcing this indemnity. Contractor shall be obligated to defend, in all legal, equitable, administrative, or special proceedings, the District and, if applicable, District's Representative, and their respective officers, directors, agents, employees, volunteers, representatives, boards, and

consultants, immediately upon tender to Contractor of the claim in any form or at any stage of an action or proceeding, whether or not liability has been established. The obligation to defend extends through final judgment, including exhaustion of any appeals. In all cases, District shall have the right to approve counsel selected by Contractor in the defense of any legal action or with respect to any claim, which approval shall not be unreasonably withheld. In addition, the indemnified party shall have the right to participate in and be represented by counsel of its own choice and at its own expense in any legal action with respect to any claim.

(b) In any and all claims against the District or District's Representative, and each of their officers, directors, employees and agents by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable under Workers' Compensation statutes, disability benefit statutes or other employee benefit statutes.

(c) Neither termination of this Contract, completion of the acts to be performed under this Contract, nor District's Representative's approval or District's acceptance of the work shall release Contractor from its obligations to indemnify and defend District and District's Representative, and their respective officers, directors, agents, employees, volunteers, representatives, boards and consultants.

(d) Submission of insurance certificates or submission of other proof of compliance with the insurance requirements in this Contract does not relieve Contractor from liability under this indemnification provision. The obligations of this section shall apply whether or not such insurance policies shall have been determined to be applicable to any of such damages or claims for damages.

2.33 **Insurance**

(a) The Contractor shall procure and maintain for the duration of the Contract and for five years thereafter, the following insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors.

(i) General Liability – Commercial General Liability (CGL) – Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars ($2,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to District) or the general aggregate limit shall be twice the required occurrence limit.

(ii) Automobile Liability – Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) with limit of one million dollars ($1,000,000) for bodily injury and property damage each accident.

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(iii) Workers' Compensation Insurance – The Contractor shall provide workers' compensation coverage as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than $1,000,000 per accident for bodily injury or disease.

(iv) Builder's Risk – (Course of Construction) – insurance utilizing an "All Risk" (Special Perils) coverage form with limits equal to the completed value of the project and no coinsurance penalty provision.

The above minimum insurance coverage limits can be met through provision of umbrella or excess policy insurance coverage consistent with the provisions of this section.

(b) If the Contractor maintains broader coverage and/or higher limits than the minimums shown above, the District requires and shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum of insurance and coverage shall be available to the District. Furthermore, the above minimum insurance coverage limits can be met through provision of umbrella or excess policy insurance coverage consistent with the provisions of this section 2.33.

(c) Any deductibles or self-insured retentions must be declared to and approved by District. At the option of District, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects District, its officers, officials, employees and volunteers; or Contractor shall procure a bond or other security guaranteeing payment of losses and related investigations, claim administration and defense fees, costs and expenses. All policies that include a self-insured retention shall include a provision that payments of defense costs and damages (for bodily injury, property damage, personal injury or any other coverages included in the policy) by any party, including additional insureds and insurers, shall satisfy the self-insured retention limits.

(d) The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

(i) Waiver of Subrogation (also known as Transfer of Rights of Recovery Against Others to Us): The Contractor hereby agrees to waive rights of subrogation to obtain endorsement necessary to affect this waiver of subrogation in favor of the District, its directors, officers, employees, and authorized volunteers, for losses paid under the terms of this coverage which arise from work performed by the Name Insured for the District; this provision applies regardless of whether or not the District has received a waiver of subrogation from the insurer.

(ii) District, and its officers, officials, employees, agents and volunteers are to be covered as additional insureds as respects: liability arising out of activities performed by or on behalf of Contractor, products and completed operations of Contractor; premises owned, occupied or used by Contractor; or automobiles owned, leased, hired or borrowed by Contractor. The coverage shall contain no special limitations on the scope of protection afforded to District, its officers, officials, employees, agents or volunteers. The additional insured coverage or endorsement shall comply with California Insurance Code section 11580.04.

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(iii) For any claims related to this project, Contractor's general and automobile liability coverage shall be primary insurance as respects District, its officers, officials, employees, agents and volunteers. Any insurance or self-insurance maintained by District, its officers, officials, employees, agents or volunteers shall be excess to Contractor's insurance and shall not contribute with it.

(iv) Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to District, and its officers, officials, employees, agents or volunteers.

(v) Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(vi) Each insurance policy required by this section shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, or reduced in coverage or in limits except after 30 days' prior written notice by U.S. mail has been given to District, or after 10 days' written notice in the case of cancellation for non-payment of premium.

(e) Course of construction policies shall contain, or be endorsed to contain, the following provisions: (a) District shall be named as loss payee; and (b) the insurer shall waive all rights of subrogation against District.

(f) Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-:VII or equivalent and that are authorized to do business in California, unless otherwise approved by District. In the case of Workers' Compensation and Employer's Liability insurance, coverage provided by the California State Compensation Insurance Fund is acceptable.

(g) Before commencing work, Contractor shall provide to District the following proof of insurance: (a) certificate(s) of insurance on ACORD Form 25-S (or insurer's equivalent) evidencing the required insurance coverages; and (b) endorsement(s) on ISO Form CG 20 10 (or insurer's equivalent), signed by a person authorized to bind coverage on behalf of the insurer(s) and certifying the additional insured coverages, or equivalent additional insured blanket endorsement. District reserves the right to require complete copies of all required insurance policies and/or endorsements affecting required insurance coverage at any time.

(h) Contractor shall include all actions and activities of its subcontractors as insureds under its policies, or shall require each subcontractor to provide insurance coverage consistent with the foregoing and to furnish separate endorsements or certificates to District. All coverages for subcontractors shall be subject to all of the requirements stated in this section.

(i) Contractor shall maintain all required insurance coverages for the period provided in this section. If any of the required coverages expire during the coverage period, Contractor shall obtain renewal or replacement coverages and deliver certificates for the renewed or replacement coverages and any required endorsements to District at least 10 days before the expiration date of the existing coverage.

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(j) Any products/completed operations insurance coverage shall be maintained after completion of the Work for the full guarantee period.

(k) The requirements as to the types, limits, and Districts approval of insurance coverage to be maintained by Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under the Contract.

(l) In addition to any other remedy District may have, if Contractor or any of its subcontractors fails to maintain the insurance coverage as required in this section, District may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and District may deduct the cost of such insurance from any amounts due or which may become due Contractor under this Contract.

(m) Contractor shall execute and file with District the attached Contractor's Workers' Compensation Certificate in accordance with California Labor Code section 1861.

2.34 **Final Acceptance and Date of Completion**

(a) Whenever Contractor shall deem all Work under this Contract to have been completed, it shall so notify District's Representative in writing, and District's Representative or other District representative shall promptly ascertain whether the Work has been satisfactorily completed and, if not, shall advise Contractor in writing of specific defects and any additional Work required.

(b) Neither the final payment nor any part of the retained percentage shall become due until Contractor, if required, shall deliver to District, a complete release of all liens and claims arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien or claim could be filed; but Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to District, to indemnify the District against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, Contractor shall refund to District all monies that the latter may be compelled to pay in discharging such a lien, or claim, including all costs and reasonable attorneys' fees.

(c) When all the provisions of the Contract have been fully complied with to the satisfaction of District, District will accept the Work in writing and make the final payment to Contractor. As a condition of receiving the final payment, Contractor must execute and deliver to District, as appropriate, a Conditional Waiver and Release Upon Final Payment or Unconditional Waiver and Release Upon Final Payment in the form provided in Civil Code sections 8136 or 8138, respectively.

(d) Except for any sum required to be withheld by law or allowed to be held under this Contract, the 5% retention shall be paid 35 days after District's acceptance of the Work. In accordance with California Public Contract Code section 7107(c), in the event of a dispute between the parties, District may withhold from the final payment to Contractor an amount not to exceed 150% of the disputed amount.

SAMPLE

2.35 Right to Withold Payments

(a) In addition to all other rights and remedies of District provided by law and this Contract, District may withhold the whole or any part of any progress or final payment to such extent as may reasonably be necessary to protect District from loss on account of: (a) unacceptable, defective or nonconforming Work not remedied; (b) claims or liens filed or reasonable evidence indicating probably filing of claims or liens including, but not limited to, claims under sections 1775, 1776 and 1777.7 of the California Labor Code or the public works stop notice provisions in the California Civil Code; (c) failure of Contractor to make payments properly for labor, materials, equipment, or other facilities, or to subcontractors and/or suppliers; (d) a reasonable doubt that the Work can be completed for the balance then unearned; (e) failure of Contractor to clean up the job site, repair or replace damaged or affected improvements or property; or (f) damage to job site, completed Work, or other real or personal property.

(b) Whenever District withholds any monies pursuant to this paragraph, written notice of the amount withheld and the reasons for the withholding will be given to Contractor. After Contractor has corrected the enumerated deficiencies to the satisfaction of District, District will promptly pay to Contractor the amount so withheld. When District withholds monies to protect District against claims under the public works stop payment notice provisions of the California Civil Code, District may at its discretion permit Contractor to deliver a surety bond in terms and amount satisfactory to District, indemnifying District against any loss of expense, and upon acceptance thereof by District, District shall release to Contractor monies so withheld.

2.36 State Audit Contingency

Contractor acknowledges that this Contract, and performance and payments under this Contract, are subject to examination and audit by the State Auditor General for three years following final payment under this Contract pursuant to California Government Code section 8546.7.

2.37 Liquidated Damages

If Contractor does not complete the Work, as determined by District, before the expiration of the Contract time limit, or within any time extension granted by District, then District will sustain damage, and that it may be impracticable to determine the actual amount of damage by reason of the delay. The parties therefore agree that Contractor shall pay District as damages the daily liquidated damages amount stated above for each and every day's delay in finishing the Work beyond the Work completion deadline. The parties agree that this liquidated damages provision is reasonable under the circumstances existing at the time the Contract was made. District shall have the right to deduct the amount of liquidated damages from any money due or to become due Contractor.

2.38 Waiver of Interest

District shall have no obligation to pay and Contractor hereby waives the right to recover interest with regard to monies which District must withhold by reason of judgment, order, statute or judicial process, or which it may withhold pursuant to this Contract.

SAMPLE

2.39 Claims and Resolution of Disputes

(a) General. The parties intend that differences between the parties, arising under the Contract, be brought to the attention of the District at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The parties agree to initially strive to resolve all disputes amicably and in an informal manner. Any dispute resolved informally shall be documented by the District, and if the dispute resolution involves a change in the contract work, increase or decrease in the compensation due the Contractor, or adjustment in the time of completion of the Work, then the informal dispute resolution shall be confirmed by a Change Order pursuant to section 2.12. Informal discussions or negotiations with the District or its representatives concerning informal resolution of a dispute shall not toll or suspend the claim filing and other deadlines provided below, unless so provided by the District in writing. Willingness of the District to engage in any such discussions is not a waiver of the District's right to deny a claim or dispute based on lack of merit, or procedural deficiency, or both.

(b) Compliance Required. Contractor shall not be entitled to any additional time to complete Work or the payment of any additional compensation for claimed extra work (or otherwise on account of any claim of any additional compensation for claimed extra work occurrence) unless either District has issued a Change Order pursuant to section 2.12 or a claim has been timely filed and approved pursuant to this section. If the Contractor fails to file a written claim within the claim deadline in section 2.39(d), then the Contractor agrees that it was waived any right or remedy to thereafter pursue the claim against the District in any administrative, arbitration or litigation proceeding, and the District may elect to document this waiver.

(c) Scope of Claims. A claim for purposes of this section means a separate demand by the Contractor for (a) a time extension (including a demand for relief from damages or penalties for delay assessed by the District under the Contract), (b) payment of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the Contractor is not otherwise entitled to, or (c) an amount the payment of which is disputed by the District.

(d) Filing of Contract Claim; Contents; Filing Deadline

(i) The Contractor shall file any "Contract Claim" with the District. A Contract Claim must (a) be in writing, (b) be labeled or clearly indicated as a claim under the Contract, (c) set forth in detail the reasons why the Contractor believes additional compensation or a time extension is or may be due, the nature of the costs involved, and, insofar as possible, the amount of the claim, and (d) include (or reference earlier provided) documents that support and substantiate the claim as both entitlement and quantification of time, money, or both.

(ii) A Contract Claim must be submitted to the District within the following claim following deadlines:

A. if a deadline is set forth in the Contract for filing of the particular claim, then the claim must be filed by the specified time;

SAMPLE

B. if the claim relates to extra, additional or unforeseen work for which the Contractor intends to demand additional compensation, a time extension, or both, notice shall be given to the District prior to the time that the Contractor commences performance of the work giving rise to the potential claim for additional compensation or time extension, and Contractor shall not proceed with that work until so directed by the District; and

C. for all other claims not included within (a) or (b), the claim must be filed on or before 15 days after the date of the occurrence, event or circumstance giving rise to the claim. In no event shall a Contract Claim be filed later than the date of final payment.

(e) Processing of Claims, Generally. This Contract provides for two types of Contract Claims, which will be processed and resolved under different subsections. Any claim for money or damages or for a time extension (i.e., any claim subject to Public Contract Code section 20104) shall be processed and resolved in accordance with section 2.39(f). Any Contract Claim sent to District by registered mail or certified mail with return receipt requested (i.e., any claim subject to Public Contract Code section 9204) shall be processed and resoled pursuant to section 2.39(g).

(f) Claims for Money, Damages, or for Time Extension

(i) District Response to Contract Claim. The District shall respond in writing to the Contract Claim within 60 days of receipt of the claim (or within 45 days of receipt for claims of less than $50,000), 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 District may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subsection, upon mutual agreement of the District and the Contractor. The District's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt (or 15 days after receipt for claims of less than $50,000) of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater. The District shall not fail to pay money as to any portion of a Contract Claim that is undisputed except as otherwise provided in the Contract.

(ii) Meet and Confer. If the Contractor disputes the District's written response, or the District fails to respond within the time prescribed, the Contractor my notify the District, in writing, either within 15 days of receipt of the District's response or within 15 days of the District'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 such a demand, the District shall schedule to meet and confer conference within 30 days for the parties to consider settlement of the dispute. If the Contractor fails to timely demand a meet and confer conference within the applicable 15-day period, then the Contractor shall be deemed not to dispute the District's written response to the Contract Claim and the District's decision on the Contract Claim shall be final, conclusive and binding, and the Contractor shall be deemed to have waived all its rights to further protest, judicial or otherwise.

SAMPLE

(iii) Government Code Claim. Following the meet and confer conference, if the Contract Claim or any portion remains in dispute, the Contractor may file a Government Code Claim as provided in Government Code title 1, division 3.6, part 3, chapters 1 (commencing with section 900) and 2 (commencing with section 910). The running of the period of time within which Contractor must file a Government Code Claim shall be tolled from the time the Contractor submits a timely Contract Claim pursuant to section 2.39(d) until the time that the Contract Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process. The District shall respond to any Government Code Claim in accordance with the Government Claims Act.

(iv) Lawsuit. If the claim is not resolved pursuant to this section, the Contractor may file a lawsuit on the claim within the limitations period provided by the Government Claims Act. If the Contractor fails to timely file a lawsuit within the limitations period of the Government Claims Act, then the District's response to the Government Code Claim shall be final, conclusive and binding on the Contractor, and the Contractor thereafter shall be barred from filing a lawsuit on the claim.

(v) Mediation. If the Contractor timely files a lawsuit, then within 60 days, but no earlier than 30 days, following the filing of responsive pleadings, the court shall submit the matter to non-binding 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. The mediator's fees and expenses shall be split and paid equally between the parties. The court may, upon request by any party, order any witnesses to participate in the mediation process.

(vi) Arbitration. If the matter remains in dispute following the mediation or if the parties waive the mediation, then the case shall be submitted to judicial arbitration pursuant to Code of Civil Procedure part 3, title 3, chapter 2.5 (commencing with section 1141.10), notwithstanding section 1141.11 of that code. The Civil Discovery Act of 1986 (Code of Civil Procedure part 4, title 3, chapter 3, article 3 (commencing with section 2016.010)) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration. The arbitrator shall be experienced in public works construction law. The arbitrator's fees and expenses shall be split and paid equally by the parties, except where the arbitrator, for good cause, determines a different division. The court may, upon request by any party, order any witnesses to participate in the arbitration process. Any party who, after receiving an arbitration award, requests a trial de novo but does not obtain a more favorable judgment shall (in addition to payment of any costs and fees under Code of Civil Procedure part 3, title 3, chapter 2.5 (commencing with section 1141.10)) pay the attorney's fees of the other party arising out of the trial de novo.

(vii) Interest. In any lawsuit filed under this subsection, District shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the lawsuit is filed in court.

(g) Claims Subject to Public Contract Code section 9204

SAMPLE

(i) The Contract Claim will be processed and resolved pursuant to Public Contract Code section 9204, which is summarized here:

A. District Review of Claim. Within 45 days after receiving a complete Contract Claim, District shall review the claim and provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. District will pay any undisputed portion of the claim within 60 days from the date of the written statement. If District fails to timely issue a written statement, the claim shall be deemed rejected in its entirety.

B. Meet and Confer Conference. If the Contractor disputes the District's written statement or if the Contract Claim is deemed rejected, the Contractor may demand and the parties will conduct an informal conference to meet and confer regarding settlement in accordance with section 9204, subsection (d)(2). Within 10 business days following the conclusion of the meet and confer conference, District shall provide Contractor a written statement identifying the portion (if any) of the claim remaining in dispute and any undisputed portion will be paid by District within 60 days after this written statement.

C. Non-Binding Mediation. Any remaining disputed portion of the claim shall be submitted to nonbinding mediation in accordance with section 9204, subsection (d)(2).

D. Interest. Any amount not paid in a timely manner as required by this subsection shall bear interest at a rate of 7 percent per annum until paid.

The foregoing is summary of section 9204. In the event of any conflict between the summary and section 9204, the statute will govern.

(ii) Lawsuit and Judicial Reference. If mediation is unsuccessful and all or parts of the Contract Claim remain in dispute, then the Contractor may pursue a lawsuit. If the Contractor timely files a lawsuit, the case shall be submitted to judicial reference pursuant to California Code of Civil Procedure sections 638 and 640 through 645.1 (or any successor statute) and California Rules of Court title 3, division 9 (commencing with section 3.900). As authorized by Code of Civil Procedure section 638, a referee will consider and decide all factual and legal issues in the action. Each party acknowledges that it will not have any right to a jury trial or to have any judicial officer besides the referee hear or decide the action. When Contractor initiates the superior court lawsuit, it will, at the same time it files the complaint in the action, also file a motion for appointment of a single referee.

A. Appointment of a referee shall be by mutual agreement within 30 days between the parties, and if unsuccessful, then by the court and will be governed by Code of Civil Procedure section 640, and subject to objection by either party as provided by Code of Civil Procedure section 641. The referee must be a retired judge or a licensed attorney with at least ten years substantive experience in public works construction matters.

SAMPLE

B. The parties shall be entitled to discovery and the referee shall oversee discovery and may enforce all discovery orders in the same manner as a superior court judge. The referee shall have the authority to consider and rule on appropriate pre-hearing and post-hearing motions in the same manner as a superior court judge. The referee will have the authority to set a briefing and hearing schedule for any such motion or for a hearing on the merits.

C. The referee's statement of decision shall include findings of fact and conclusions of law. The statement of decision will stand as the decision of the superior court and, upon filing of the statement with the clerk of the court, judgment may be entered pursuant to Code of Civil Procedure section 644, subsection (a). The parties will have rights to appeal the final judgment so entered.

D. Each party will pay half of the costs of the referee and the administrative fees of the reference proceeding, and each party will bear its own costs, expenses and attorney fees for the reference proceeding.

(h) Contract Work Pending Claim Resolution. Unless otherwise directed in writing by the District, pending resolution of a claim under this section, the Contractor shall continue to diligently prosecute the Work in accordance with the Contract and the instructions of the District.

(i) Tort Claims. The provisions of this section apply only to contract-based claims and they shall not apply to tort claims, and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Government Code title 1, division 3.6, part 3, chapters 1 (commencing with section 900) and 2 (commencing with section 910).

2.40 Assignment of Anti-Trust Claims

In entering into this Contract, Contractor offers and agrees to assign to District 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. Code, section 15) or under the Cartwright Act (chapter 2 (commencing with section 16700) of part 2 of division 7 of the California Business and Professions Code), arising from purchases of goods, services or materials pursuant to this Contract. The assignment shall be made and become effective at the time District tenders final payment to Contractor, without further acknowledgement by the parties.

2.41 Integration

This Contract constitutes the sole, final, complete, exclusive and integrated expression and statement of the terms of this contract among the parties concerning the subject matter addressed herein, and supersedes all prior negotiations, representations or agreements, either oral or written, that may be related to the subject matter of this Contract, except those other documents that are expressly referenced in this Contract.

SAMPLE

2.42 Counterparts and Electronic Signatures

This Contract may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute the same instrument. Counterparts may be delivered by facsimile, electronic mail (including PDF or any electronic signature complying with California's Uniform Electronic Transactions Act (Civ. Code, §1633.1, et seq.) or any other applicable law) or other transmission method. The parties agree that any electronic signatures appearing on the Contract are the same as handwritten signatures for the purposes of validity, enforceability, and admissibility.

2.43 Independent Contractor

The relationship between District and Contractor is that of an owner and independent contractor, and all persons hired or employed by Contractor shall be Contractor's employees, agents or subcontractors.

2.44 Governing Law

This Contract shall be construed and enforced in accordance with, and the validity and performance of this Contract shall be governed by, the laws of the State of California.

2.45 Waiver; Remedies

Any waiver at any time by either party of its rights with respect to a breach or default or any other matter arising in connection with this Contract shall not be deemed to be a waiver with respect to any other breach, default or matter. The rights and remedies provided in this Contract are in addition to any of the rights and remedies provided by law.

2.46 Severability

The illegality or unenforceability of any provision of this Contract shall not render the other provisions unenforceable, invalid or illegal.

2.47 Binding on Successors

This Contract shall bind and inure to the benefit of the heirs, successors, assigns, and successor companies of the parties; however, Contractor shall not assign or transfer any rights, obligations or interest in the Contract without the prior written consent of District.

2.48 Notices

Any invoice, payment, notice, demand, request, consent, approval or notification of change of address that either party to this Contract may or is required to give to the other party will be in writing and signed for the party by an authorized officer and addressed to the addresses set forth above. All such notices will be deemed to have been received on the day of delivery if either personally delivered or sent by recognized national overnight courier service or three days after mailing if enclosed in a properly addressed and stamped envelope and deposited in a United States post office for first-class delivery. Either party may change its address at any time by notifying the other party in writing of the change of address in accordance with this section.

SAMPLE

The parties enter into and execute this Contract effective on the date written above.

For District:

Authorized Signature: _____

Printed Name: _____

Title: _____

For Contractor:

Authorized Signature: _____

Printed Name: _____

Title: _____

SAMPLE

3 CONTRACTOR'S WORKERS' COMPENSATION CERTIFICATE

(Labor Code Section 1861)

To: Mammoth Community Water District

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 under this Contract.

For Contractor

Authorized Signature: _____

Printed Name: _____

Title: _____

Company Name: _____

Date: _____

SAMPLE

4 PAYMENT BOND

KOWN ALL MEN BY THESE PRESENTS,

THAT, WHEREAS, the Mammoth Community Water District, hereinafter designated as the "District", has awarded to _____ hereinafter designated as the "Contractor" a Contract for the work described as follows:

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

The project consists of installation of additional air diffusers and piping in aeration basins, replacement of isolation gates in aeration basins, rehabilitations of concrete by crack sealing and surface coating, replacement of a secondary scum pipe, and installation of FRP weir troughs in a secondary clarifier. 3 isolation gates, 2 aeration grids comprising of approximately 360 diffusers and associated piping, 520 linear feet of concrete joints and 1,380 square feet of concrete surfaces, 150 linear feet of FRP weirs and 27 trough supports, and 8 feet of 6" pipe will be installed or rehabilitated.

WHEREAS, the Contractor is required by the Contract and by the provisions of Division 4, Part 6 of the Civil Code to furnish a bond in connection with the Contract, as hereinafter set forth.

WHEREAS, the Contract by this reference is made a part hereof;

NOW, THEREFORE, we, the undersigned Contractor, as Principal, and _____

_____, as Surety, a corporation organized and existing under the laws of the State of _____, duly authorized and in good standing to transact business under the laws of the State of California, as an admitted Surety, are held and firmly bound unto the District in the sum of $ _____, the sum being not less than one hundred percent (100%) of the total Contract amount payable by the District, under the terms of the Contract, for which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT, if the Contractor, its heirs, executors, administrators, successors, assigns or subcontractors shall fail to pay for any materials, provisions, provender or other supplies or teams, implements or machinery used in, upon, for or about the performance of the work contracted to be done, or shall fail to pay for any work or labor thereon of any kind, or shall fail to pay any of the persons named in Civil Code Section 9100, or shall fail to pay for amounts due under the Unemployment Insurance Code with respect to such work or labor as required by the provisions of Division 4, Part 6 of the Civil Code, or shall fail to pay for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code with respect to such work or labor, and provided that the

SAMPLE

claimant shall have complied with the provisions of that Code, the Surety or Sureties hereon will pay for the same in amount not exceeding the sum specified in the Contract, otherwise the above obligation shall be void. In case suit is brought upon this bond, the Surety will pay a reasonable attorney's fee to the prevailing party to be fixed by the court. This bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Section 9100 of the Civil Code, so as to give a right of action to them or to their assigns in any suit brought upon this bond. And the Surety, for value received, hereby stipulates and agrees that not change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specification.

The address or addresses at which the principal and surety(ies) may be served with notices, papers and other documents under the California Bond and Undertaking Law (Code of Civil Procedure section 995.010 et seq.) is the following:

_____

_____

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

For Contractor as Principal:

_____

Name: _____

Title: _____

For Surety:

_____

Name: _____

Title: _____

(Seal)

(NOTE: The date of this bond must not be prior to date of Contract. If Contractor is a partnership, all partners should execute bond.)

SAMPLE

5 FAITHFUL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS,

THAT, WHEREAS, Mammoth Community Water District, hereinafter designated as the "District," entered into a Contract with _____, hereinafter designated as the "Contractor" for the work described as follows:

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

The project consists of installation of additional air diffusers and piping in aeration basins, replacement of isolation gates in aeration basins, rehabilitations of concrete by crack sealing and surface coating, replacement of a secondary scum pipe, and installation of FRP weir troughs in a secondary clarifier. 3 isolation gates, 2 aeration grids comprising of approximately 360 diffusers and associated piping, 520 linear feet of concrete joints and 1,380 square feet of concrete surfaces, 150 linear feet of FRP weirs and 27 trough supports, and 8 feet of 6" pipe will be installed or rehabilitated.

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

WHEREAS, the Contract is by reference made a part hereof;

NOW, THEREFORE, we, the undersigned Contractor, as Principal, and _____, a corporation organized and existing under the laws of the state of _____, and duly authorized and in good standing to transact business under the laws of the State of California, as an admitted Surety, are held and firmly bound unto the District in the penal sum of $ _____, the sum being not less than one hundred percent (100%) of the total Contract amount, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

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

As a condition precedent to the satisfactory completion of the said Contract, the above obligation in above-stated amount shall hold good for a period of one (1) year after the recording of the notice of completion, during which time if the Contractor, its heirs, executors, administrators, successors or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the District from loss or damage made evident during the

SAMPLE

period of one (1) year from the date of recording of the notice of completion, and resulting from or caused by defective materials or faulty workmanship in prosecution of the work done, the above obligation in the above-stated amount shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Contractor remains.

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

In the event suit is brought upon this bond by the District and judgment is recovered, the Surety shall pay all costs incurred by the District in such suit, including, but not limited to, administrative and consultant costs, and reasonable attorney's fees to be fixed by the Court.

The address or addresses at which the principal and surety(ies) may be served with notices, papers and other documents under the California Bond and Undertaking Law (Code of Civil Procedure section 995.010 et seq.) is the following:

_____

_____

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

For Contractor as Principal:

_____

Name: _____

Title: _____

For Surety:

_____

Name: _____

Title: _____

(Seal)

SAMPLE

(NOTE: The date of this bond must not be prior to date of Contract. If Contractor is a partnership, all partners should execute bond.)

SAMPLE

EXHIBIT A

TECHNICAL SPECIFICATIONS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation

Mammoth Lakes, CA

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1 SUMMARY OF WORK

The specifications presented herein are intended to provide the information necessary for all parties concerned with the work to know the nature and amounts of materials and the work required to successfully replace control gates and add air diffusers to aeration basins, repair concrete cracks, and replace weir troughs and a corroded scum collection pipe in a secondary clarifier at the wastewater treatment plant owned by the Mammoth Community Water District (MCWD WWTP) and located within the Town of Mammoth Lakes, CA. The locations of the facilities are shown in **Figure 1**.

Mammoth Community Water District (MCWD) is the OWNER. All demolition and construction shall be conducted in accordance with the Town of Mammoth Lakes building code except where specified in these TECHNICAL SPECIFICATIONS and/or CONTRACT DRAWINGS.

The scope of work generally includes the following:

a. Remove and dispose of the weir troughs and supports in the designated secondary clarifier at the MCWD WWTP.
b. Install MCWD-provided FRP weir troughs and stainless steel trough supports.
c. Remove and dispose of 2 existing slide control gates in the aeration basins.
d. Perform surface preparation, material application, and any additional concrete rehabilitation methods prescribed for specific concrete repairs at designated location in the aeration basin, primary clarifier, primary effluent channel, and underground pipe gallery at the MCWD WWTP.
e. Provide and install 2 replacement slide gates and 1 new butterfly gate in the aeration basins.
f. Provide and install new control valves, downpipes, headers, and drainpipes for the additional aeration grids in the selector zone segments of the aeration basins.
g. Provide pumps, temporary dams, and any additional components necessary to transfer mixed liquor between aeration basins as needed.
h. Provide pumps, temporary dams, and any additional components necessary to transfer primary treated wastewater while rehabilitating concrete in the primary effluent channel.

2 CONTRACT DRAWINGS

The form and detail of the various features of the demolition and construction work are shown on the following drawings sets, included in Exhibit B:

- Demolition and Construction Plans

Original design drawings of the Primary Clarifier, Primary Effluent Channel, Aeration Basins, Secondary Clarifier, and Pipe Gallery are included as Exhibit G for further reference.

3 QUALIFICATIONS OF THE CONTRACTOR

The CONTRACTOR, in order to qualify for award of the contract, shall be licensed in the State of California, hold a Class A Contractor License, and shall have experience in the demolition and installation of WWTP equipment and concrete rehabilitation work of similar details for a period of not less than 5 years.

4 INSURANCE

See Mammoth Community Water District Modified Short Form Contract for Insurance Requirements.

5 PERMITS

Permits required by the State of California, Town of Mammoth Lakes, Great Basin Unified Air Pollution Control District, or any other agency having jurisdiction for demolition and installation of WWTP additions and modifications shall be obtained by the OWNER.

6 SITE ACCESS

The buildings sites are located with the Town of Mammoth Lakes on parcels owned by OWNER. Access to each building shall be by existing paved roads.

7 WORK AREA CONSTRAINTS AND SITE SECURITY

The MCWD WWTP is located on land with restricted public access. The WWTP contains treatment processes, control and power systems, and other components necessary for full-time operation of the plant. Demolished building materials, construction waste, scraps, etc. cannot be allowed to enter the Headworks, Primary Clarification Tanks, Aeration Basins, Secondary Clarifiers, Aerobic Digesters, Equalization Basin, Recycled Water Basin, etc.

The CONTRACTOR shall use reasonable care and responsibility to protect the MCWD WWTP and nearby buildings and sites against damages, and shall take precautions that the storage and/or installation of materials and/or equipment does not overload roof decks or building structures. The CONTRACTOR shall be responsible for the correction of any damage incurred as a result of the performance of the contract.

Storage of equipment, materials, and vehicles necessary for performance of the work is available nearby in the MCWD District Yard for the duration of the project. Access is permitted during regular MCWD working hours from 7:00AM to 4:30PM Monday-Friday.

8 WATER AND POWER

The CONTRACTOR shall make arrangements to obtain water from the OWNER at the OWNER's office at 1315 Meridian Blvd., Mammoth Lakes, CA. The CONTRACTOR shall provide all equipment for hauling and storing water from the OWNER's office to the SITES. The CONTRACTOR shall provide for all costs of supplying water for the demolition and construction project, which shall be included the Mobilization tasks of Unit Bid Schedule.

The CONTRACTOR shall provide all power required for operations under the CONTRACT.

9 ON-SITE SANITATION

No restroom facilities are available at the MCWD WWTP. The CONTRACTOR shall provide for a portable toilet facility for the duration of all related work at the MCWD WWTP. The cost for the portable toilet shall be included in the Mobilization tasks of Unit Bid Schedule.

10 EXISTING UTILITIES

The CONTRACTOR shall be fully responsible for the protection of all existing surface and underground utilities during all phases of the work. The CONTRACTOR shall repair, at their expense, any damages to existing facilities caused directly or indirectly by their operations.

11 EXPOSED CONDITIONS

Existing conduits, pumps, control valves, pipes, and other essential components of the MCWD WWTP are located in and near the project areas. All efforts shall be made by CONTRACTOR to protect any newly exposed portions of facilities that could be damaged from weather and debris during construction. The cost for such work shall be included in each item's entry in the Unit Bid Schedule.

12 REPAIR AND CLEANUP

Following completion of work, the CONTRACTOR shall remove from the premises all temporary structures, fences, and excess materials, tools, and equipment used in the execution of their work, and shall dispose of all debris resulting from their work in accordance with local, state and federal regulations. The CONTRACTOR shall repair any damage to pavement around the MCWD WWTP, flood control, or other facilities damaged by CONTRACTOR. CONTRACTOR shall remove all debris from the job site in a timely and legally acceptable manner so as not to detract from the aesthetics or the functions of the buildings and sites. The cost for such items shall be included in each facility's entry in the Unit Bid Schedule.

13 TREATMENT PLANT SAFETY

Open-air tanks have safety railings, gratings, and other occupancy protections that are not designed for ingress/egress, fall protection, and other construction safety controls. CONTRACTOR shall provide all necessary scaffolding, shoring, bracing, underpinning, or propping necessary for providing safe and efficient working conditions. The cost for such items shall be included in each item's entry in the Unit Bid Schedule.

14 WASTEWATER TREATMENT BYPASSES

Bypassing the normal flow path of the wastewater treatment process, or switching between online and offline treatment trains, will be necessary at times during the project. CONTRACTOR shall be responsible for all cofferdams, pumps, piping, fittings, and other necessary items to drain or bypass flows at the WWTP. All bypasses or transitions between online and offline treatment trains will require a minimum of 3 business days' written notice to MCWD along with a written operational plan during the bypass or transition. 100% uptime must be maintained at the WWTP. The cost for bypasses and treatment train transitions shall be included in each treatment process' bypass entry in the Unit Bid Schedule.

Aeration Basin #2 currently has a leak that progresses into the pipe gallery and requires concrete crack and joint sealing before being made operational. Concrete work on Aeration Basin #2 must be completed with MCWD approval before taking Aeration Basin #1 offline and transferring mixed liquor into Aeration Basin #2 for continuous activated sludge process operations.

Submittals: CONTRACTOR shall submit a written plan and schedule for each bypass required for completion of the project.

15 ORDER OF PROJECTS

The Secondary Clarifier Weir Installation and Scum Collector Pipe Replacement work shall be performed first and is desired to be completed by November 15. This treatment unit is currently offline and requires no disruption to other treatment processes for the work to be performed by CONTRACTOR. Following the completion of the Secondary Clarifier projects, or written MCWD approval, work may proceed on the remaining scope of work.

16 SECONDARY CLARIFIER WEIR INSTALLATION

Replacement FRP weir troughs, PVC spreader bars, stainless steel trough supports, and associated installation hardware is onsite at the MCWD WWTP and shall be installed by CONTRACTOR. CONTRACTOR shall inspect these materials during pre-bid conference. Existing steel weir troughs and support arms are to be removed and disposed of by CONTRACTOR. CONTRACTOR shall install MCWD-provided weir troughs to match previous design grades and positions relative to the scum baffle, effluent box, scum deflector, center column, influent skirt, valves, catwalk, and other existing components of the secondary clarifier. The existing concrete anchor bolts are to be used and not removed except where

approved by MCWD. Shop drawings are included in Exhibit D and previous steel trough and support arm schematics are included in Exhibit C. The cost for such removal and installation shall be included in the Secondary Clarifier Weir Installation entry in the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit product sheets and shop drawings for any modifications to the replacement weir trough and support arm installation.

17 SECONDARY CLARIFIER WEIR INSTALLATION BID ALTERNATE

The existing mounting anchors bolts for the weir trough support arms in the concrete clarifier walls are to be reused where possible. If the CONTRACTOR is required to install new mounting bolts in order to install the replacement weir trough supports, CONTRACTOR shall remove any interfering existing trough support mounting bolt(s) and install suitable replacement grade 316 stainless steel drop-in anchor(s) per manufacturer's installation guidelines for the supplied ½" x 6" anchors and washers. A minimum embedment depth of 5.25" and minimum clearance of 3" to embedded rebar is required for new anchors. The cost for each existing bolt removal and new drop-in anchor installation shall be entered under the Secondary Clarifier Weir Installation Bid Alternate entry in the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit product sheet(s) and shop drawings for any modifications to the replacement weir trough and support arm installation.

18 SECONDARY CLARIFIER SCUM COLLECTOR PIPE REPLACEMENT

The existing 6" diameter flanged scum pipe with welded flanges, approximately 8.25' long, shall be removed. CONTRACTOR to supply and install replacement 6" diameter grade 304 stainless steel flanged pipe and galvanic isolation hardware. The exact dimensions of this pipe are to be verified in the field. The cost for removal and replacement of this pipe shall be entered under the Secondary Clarifier Scum Pipe Replacement entry in the unit bid schedule.

Submittals: CONTRACTOR shall submit fabrication details and drawings on the replacement stainless steel pipe and galvanic isolation hardware.

19 AERATION BASIN SLIDE GATE REPLACEMENTS

CONTRACTOR shall remove two (2) existing 36" slide gates in Aeration Basin #1 and replace with Waterman SS-250 Series slide gates and all associated operating and mounting components. CONTRACTOR to verify dimensions in field for each of the 2 replacement gates. CONTRACTOR shall remove the existing isolation gates only upon coordination with MCWD. One of the two aeration basin trains must always be fully online and operational. The cost for disposal of existing isolation gates, new isolation gates, and gate installation shall be included in the Aeration Basin Slide Gate Replacement entry in the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit product sheets and shop drawings for proposed installations for the 2 slide gates identified in the Construction Plans.

20 AERATION BASIN BUTTERFLY GATE INSTALLATION

CONTRACTOR shall furnish and install one (1) new Waterman VBG Series 24" square butterfly gate, perimeter mounting flanges, and all associated operating and mounting components. Butterfly gate shall be installed in the mixed liquor effluent trough between the Aeration Basin #1 and Aeration Basin #2 effluent slide gates. Modification to the existing trough aeration lines and cover grates may be required for butterfly gate installation. CONTRACTOR to verify dimensions in field. One of the two aeration basin trains must always be fully online and operational. Installed gates must not leak beyond the manufacturer's listed specifications. Before final payment, MCWD shall fill the necessary basin trains to verify the watertightness. The cost for the new butterfly gates, gate installation, and realignment of mixed liquor trough aeration lines and grates as necessary for clearance around the butterfly gate shall be included in the Aeration Basin Butterfly Gate Addition entry in the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit product sheets and shop drawings for proposed installations for the butterfly gate identified in the Construction Plans.

21 AERATION BASIN DIFFUSER GRID INSTALLATION

In the selector zone at each of the two (2) aeration trains CONTRACTOR shall remove any existing coarse bubble diffusers and provide and install a new replacement aeration grid consisting of: 4" connection to existing flanged connection to air trunk lines, one (1) 4" manual butterfly control valve, one (1) stainless steel drop arm, purge sump assembly, a set of ten (10) air diffuser arms each with 18 diffusers, diffuser holders, diffuser O-rings, pipe supports, and necessary fittings and attachments. Material specifications and installation details are per 2006 Aeration Basin Record Drawings by HDR, included in Exhibit G, and Sanitaire Ceramic Disc Diffuser specifications. An existing 4" flanged connection off the trunk air lines exists for each of the aeration trains and a 4" stainless steel drop pipe in Aeration Basin #2 is available for use in the diffuser additions. MCWD shall provide 9" Sanitaire ceramic fine bubble diffusers and retainer rings for installation. One of the two aeration basin trains must be fully online and operational at all times. The cost for such items shall be included in the Aeration Basin Diffuser Grid Installation entry in the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit product sheets and shop drawings for proposed installation at each of the diffuser additions identified in the Construction Plans.

22 CONCRETE CRACK AND JOINT REPAIR AND SEALING

Concrete cracks and joints with known leaks are to be rehabilitated and sealed in the eastern aeration basin, primary clarifier #1, primary effluent channel, and pipe gallery are identified in the Construction Plans in Exhibit B. AsBuilts are provided for locations and construction methods of the locations

identified for crack and joint sealing, but the exact dimensions are to be verified in the field. Any existing paint or coatings over the concrete rehabilitation areas shall be removed by sand blasting to a CSP-3 profile. Xypex Patch N Plug shall be used for actively weeping cracks and Xypex Blend shall be used for other cracks. All chipping shall be performed with a U-shaped gouging chisel, Bosch HS1475 or equivalent. Xypex Concentrate shall be used for surface sealing. All cracks shall have surface sealing applied on 1 foot to each side of the crack unless otherwise specified in the Construction Drawings. The Construction Drawings and Unit Bid Schedule totals for crack rehabilitation are only calculated for joints at the intersections of walls, floors, and ceilings. Additional cracks discovered during construction on the surfaces of walls, floors, and ceilings may be added to the Concrete Crack Sealing at the rate specified in the Unit Bid Schedule. See Exhibit C for Xypex procedures and methods.

Due to the seasonally dry and cold climate in Mammoth Lakes, extra care must be taken to ensure proper moisture and temperature conditions for curing. MCWD expects that CONTRACTOR may request a winter shutdown if outside weather conditions are not forecasted to be suitable for this work for an extended period. Xypex Gamma Cure may be used with MCWD written approval. CONTRACTOR is responsible for any and all bypasses of WWTP flows (see Wastewater Treatment Bypasses section above), surface preparation and cleaning all concrete surfaces and joints sufficiently for Xypex methods, cleanup of concrete and associated debris from the rehabilitated areas, and restoration of any equipment adjusted or moved during the concrete work. Any alternative or deviation from these materials and methods is at MCWD's discretion for acceptance as an approved alternate. The cost per linear foot of crack and joint sealing and the cost per square foot of surface sealing shall be entered into the corresponding entries of the Unit Bid Schedule.

Submittals: CONTRACTOR shall submit a desired priority of locations to crack and joint seal subject to MCWD approval in order to sequence between online and offline facilities and minimize WWTP operational disruptions. CONTRACTOR shall submit a written timeline for the preparation and application of Xypex products to ensure proper moisture and temperature conditions.

MAMMOTH COMMUNITY
WATER DISTRICT

1315 Meridian Boulevard
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N

0 250 500 Feet

Figure 1 - MCWD Wastewater Treatment Plant

EXHIBIT B

DEMOLITION AND CONSTRUCTION PLANS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Lakes, CA

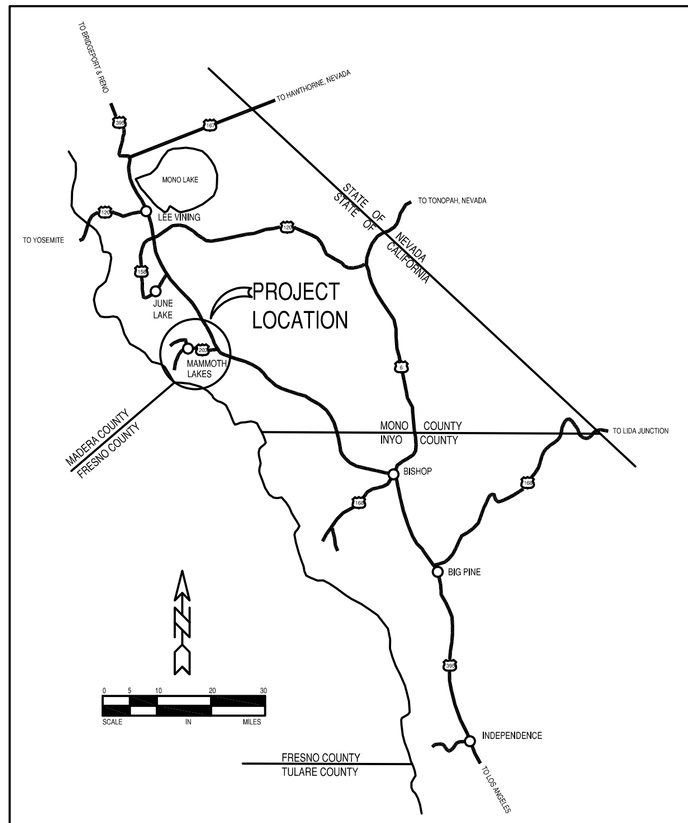
MAMMOTH COMMUNITY WATER DISTRICT

MAMMOTH LAKES, CALIFORNIA

2026 AERATION BASIN AND WWTP IMPROVEMENTS

INDEX TO DRAWINGS

SHEET NO.	CONTENT DESCRIPTION
1	TITLE SHEET
2	SECONDARY CLARIFIER DEMOLITION AND CONSTRUCTION
3	AERATION BASINS DEMOLITION
4	AERATION BASINS CONSTRUCTION
5	PRIMARY CLARIFIER AND EFFLUENT CHANNEL REHABILITATION
6	PIPE GALLERY CONSTRUCTION 1
7	PIPE GALLERY CONSTRUCTION 2



AREA MAP

SYMBOLS & LINES

- AIR/VACUUM RELEASE VALVE — AVR
- BLOWOFF VALVE — B
- HYDRANT-EXISTING
- HYDRANT-PROPOSED
- GRIND-PROPOSED
- RESTRAINED JOINT ZONE
- SEWER CLEANOUT — SCO
- SEWER MANHOLE — S
- STORM DRAIN — SD
- UTILITY MANHOLE
- WATER METER-EXISTING — WM
- WATER METER-PROPOSED — WM
- WATER VALVE-EXISTING
- WATER VALVE-PROPOSED
- CURB STOP-EXISTING
- CURB STOP-PROPOSED
- EDGE OF PAVEMENT — EP
- PROPERTY LINE/RIGHT OF WAY — PL
- SEWER LINE — S — S
- STORM DRAIN — SD — SD
- WATER LINE-EXISTING — W — W
- WATER LINE-PROPOSED — W — W
- WATER LINE-ABANDONED — ABND W

LOCATION MAP

NTS

ABBREVIATIONS

ACP	ASBESTOS CONCRETE PIPE
AC	ASPHALT CONCRETE
BF	BLIND FLANGE
BG	BELOW GRADE
CIP	CAST IRON PIPE
CL	CENTER LINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CORP	CORPORATION VALVE
CU	COPPER
DI	DRAIN INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	ELECTRIC
EP	EDGE OF PAVEMENT
EX	EXISTING
FHL	FIRE HYDRANT LATERAL
FL	FIELD LOCK
FLG	FLANGE
FSL	FIRE SERVICE LATERAL
GIP	GALVANIZED IRON PIPE
GR	GRIP RINGS
GV	GATE VALVE
HYD	FIRE HYDRANT
IPT	IRON PIPE THREAD
IRR	IRRIGATION
MAX	MAXIMUM
MCWD	MAMMOTH COMMUNITY WATER DISTRICT
MGR	MANAGER
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
NOM	NOMINAL
NTS	NOT TO SCALE
PE	POLYETHELENE PIPE PER AWWA C901
PL	PROPERTY LINE
PP	POWER POLE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE PIPE
RG	RESTRAINING GLAND
ROW	RIGHT OF WAY
SCE	SOUTHERN CALIFORNIA EDISON
STDN	STORM DRAIN
SD	STANDARD DETAIL
SDR	STANDARD DIMENSION RATIO
SL	SEWER LATERAL
SS	SANITARY SEWER
STA	STATION
STL	STEEL
SVC	SERVICE
TELE	COMMUNICATIONS/TELEPHONE
TEMP	TEMPORARY
TOP	TOP OF PIPE
TYP	TYPICAL
W	WATER
WSL	WATER SERVICE LATERAL

Submitted By:

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS PATRICK HOLT — No. 96285 — CIVIL — STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

TITLE SHEET

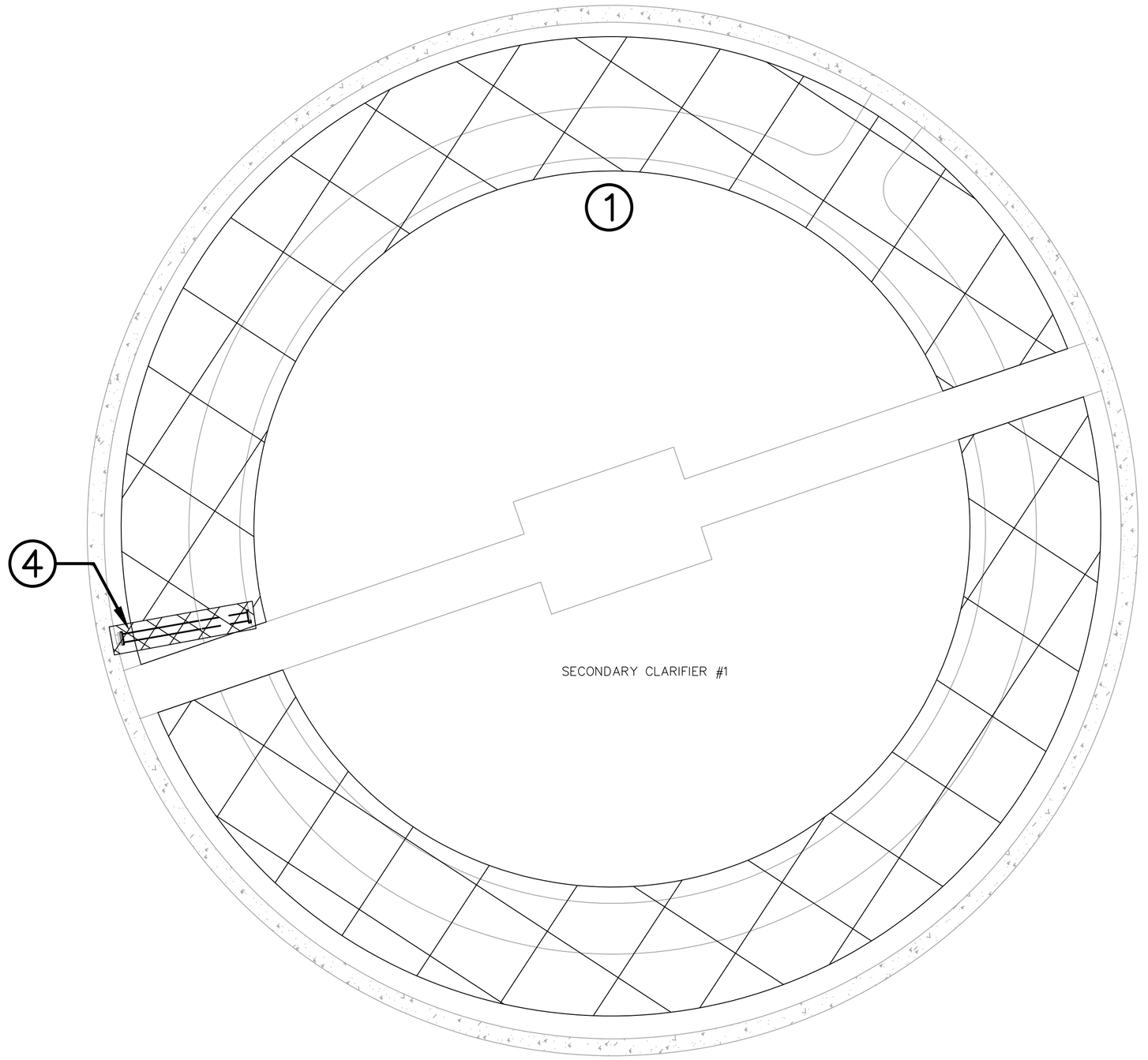
2026 WWTP PROJECTS

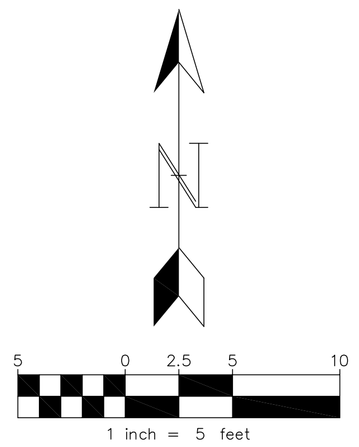
MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

MAMMOTH COMMUNITY WATER DISTRICT

DRAWN	NPH
CHECKED	NPH
DATE	9/23/2026
PROJECT NUMBER	26WW13
SCAN NUMBER	
SHEET NO.	1

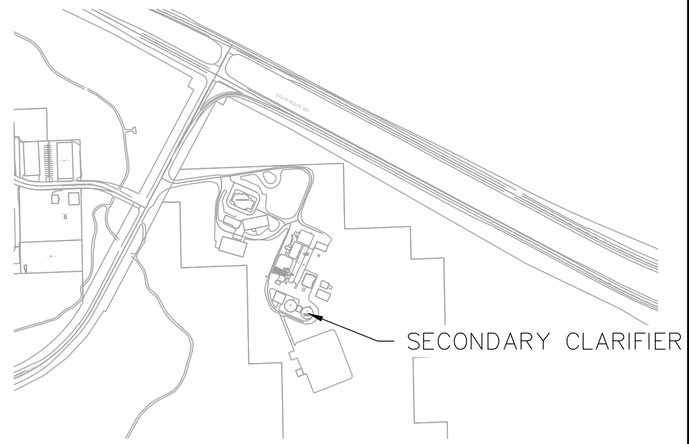
1 OF 7 SHEETS





SECONDARY CLARIFIER NOTES

1. REMOVE (E) EFFLUENT TROUGH AND SUPPORT ARMS.
2. (E) TROUGH SUPPORT ANCHOR BOLTS ARE TO BE INSPECTED FOR POTENTIAL REUSE WITH NEW TROUGH SUPPORTS.
3. INSTALL (N) EFFLUENT TROUGH, SUPPORT ARMS, SPREADER BARS, AND ASSOCIATED INSTALLATION HARDWARE PROVIDED BY MCWD.
4. REPLACE (E) 6" FLANGED EFFLUENT SCUM COLLECTOR PIPE WITH (N) SS FLANGED PIPE AND GALVANIC ISOLATION HARDWARE. VERIFY DIMENSIONS IN FIELD.
5. SEE APPENDIX E FOR EFFLUENT TROUGH PART LIST AND SCHEMATIC.
6. SEE APPENDIX G FOR ORIGINAL ASBUILTS. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS.



SECONDARY CLARIFIER NOTES:

- The secondary clarifiers are an essential part of the MCWD Wastewater Treatment Plant (WWTP) activated sludge process. At least 1 secondary clarifier is required to be operational at all times.
- At the start of this project, only Secondary Clarifier #2 is online and operational.
- Extra attention must be taken to protect any existing components in the project area and to prevent construction debris from entering any online and operational WWTP facilities.
- Dewatering and cleaning are the responsibility of the contractor.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 1993 Record Drawings, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER NICHOLAS PATRICK HOLT No. 96285 CIVIL STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

SECONDARY CLARIFIER DEMOLITION AND CONSTRUCTION

2026 WWTP PROJECTS

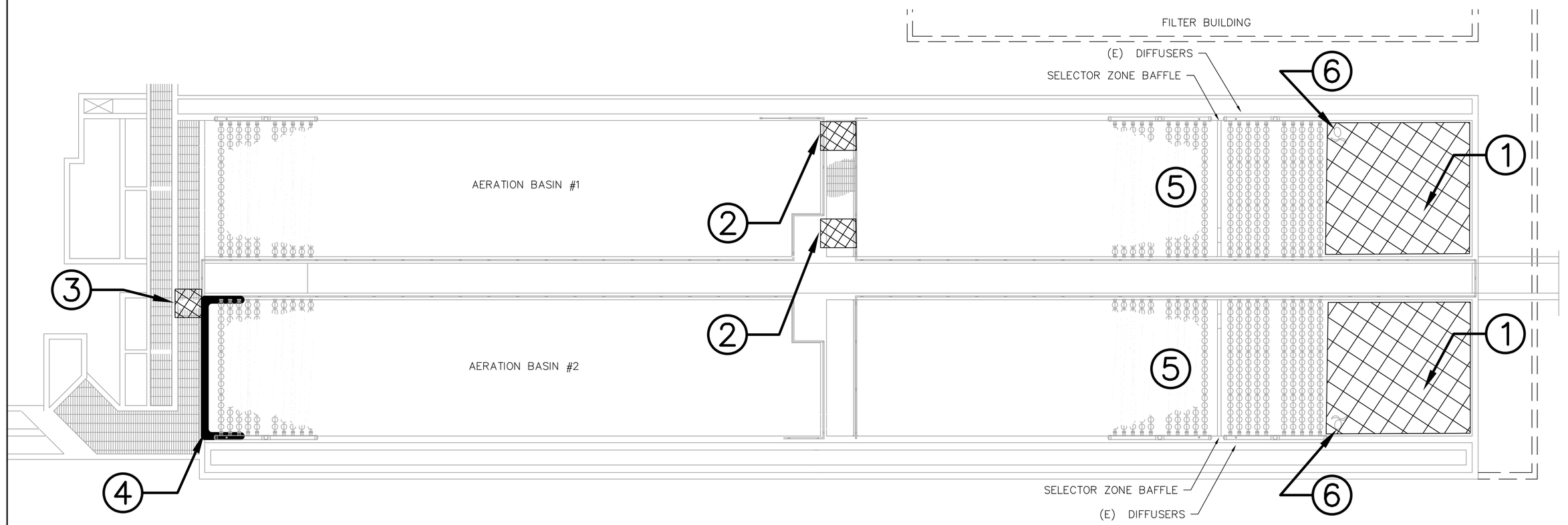
MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

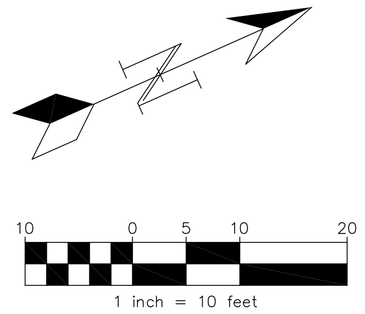
MAMMOTH COMMUNITY WATER DISTRICT

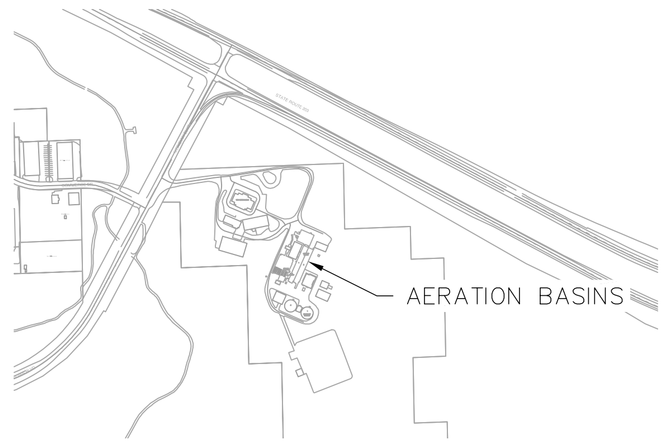
DRAWN	NPH
CHECKED	NPH
DATE	9/23/2026
PROJECT NUMBER	26WW13
SCAN NUMBER	
SHEET NO.	2

DEMOLITION NOTES

1. REMOVE EXISTING COARSE BUBBLE DIFFUSER ASSEMBLY, DROP PIPE, AND OTHER HARDWARE AS NECESSARY TO INSTALL NEW AERATION ZONES IN NORTH END OF TRAINS.
2. REMOVE (E) 36" SLIDE GATES. PRESERVE (E) GATE MOUNTING HARDWARE AS NEEDED FOR (N) WATERMAN GATE INSTALLATION.
3. REMOVE SEGMENTS OF (E) METAL GRATES AS NECESSARY TO INSTALL (N) BUTTERFLY GATE.
4. PREPARE CONCRETE SURFACES AND CRACKS FOR REPAIRS PER XYPEX SPECIFICATIONS (SEE EXHIBIT C).
5. PROTECT (E) FINE BUBBLE DIFFUSERS.
6. PROTECT (E) MIXERS AND ASSOCIATED HARDWARE. MIXERS MAY BE TEMPORARILY MOVED DURING CONSTRUCTION.







AERATION BASIN NOTES:

- The aeration basins are an essential part of the MCWD Wastewater Treatment Plant (WWTP) activated sludge process. At least 1 of the aeration basins is required to be operational at all times.
- At the start of this project, only Aeration Basin #1 is online and operational.
- Trunk air lines, purge lines and valves, air control valves, and miscellaneous air and control conduits are located around the aeration basins. Extra attention must be taken to protect any existing components in the project area and to prevent construction debris from entering any online and operational WWTP facilities.
- Dewatering and cleaning are the responsibility of the contractor.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 2006 Record Drawings, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER NICHOLAS PATRICK HOLT No. 96285 CIVIL STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

AERATION BASINS DEMOLITION

2026 WWTP PROJECTS

MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

DRAWN	NPH
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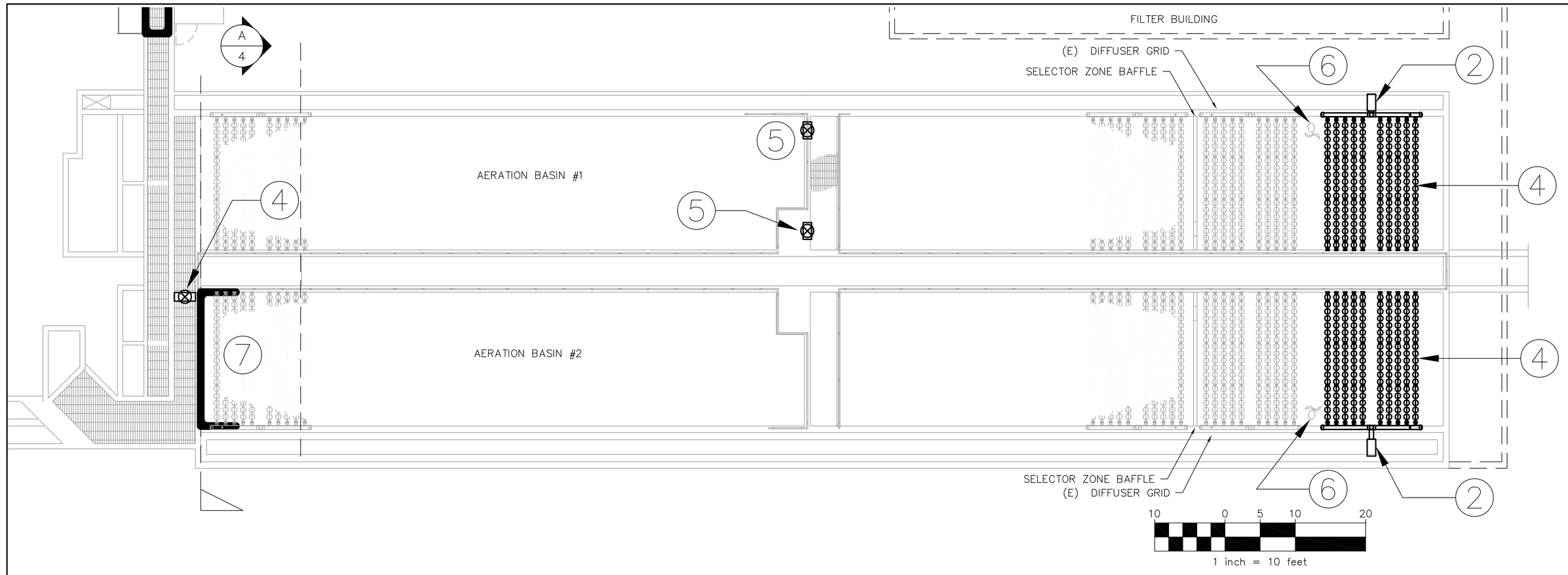
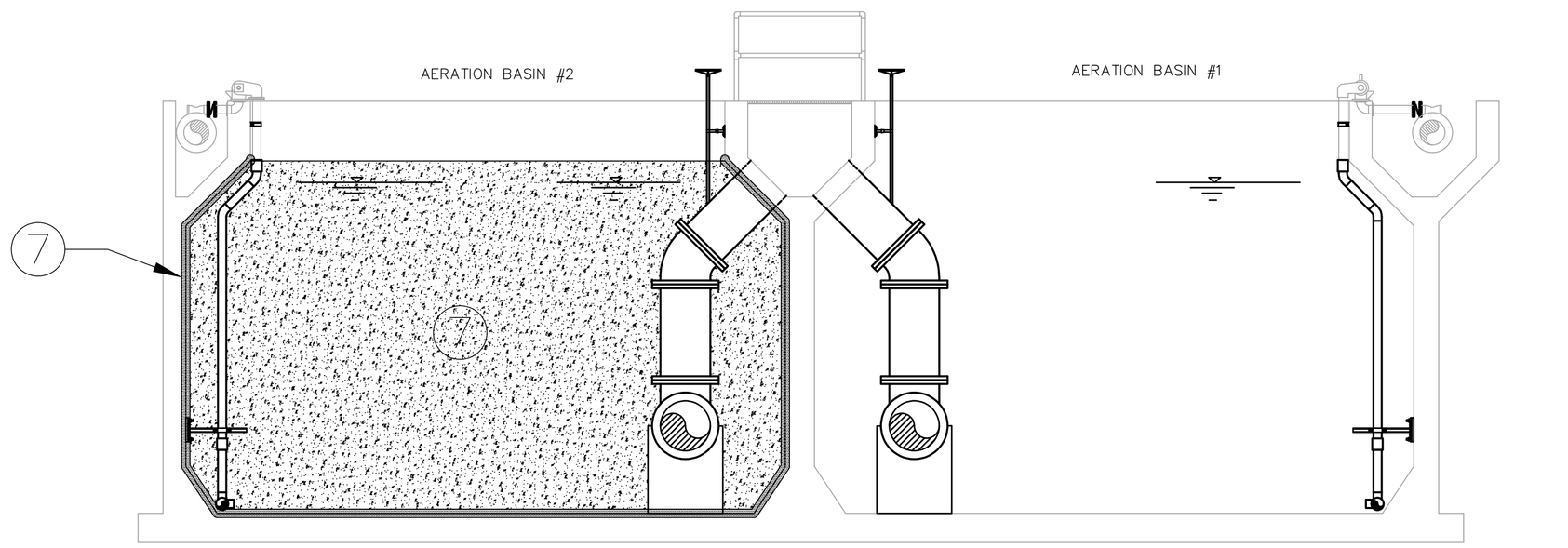
PROJECT NUMBER	26WW13
SCAN NUMBER	
SHEET NO.	3

3 OF 7 SHEETS



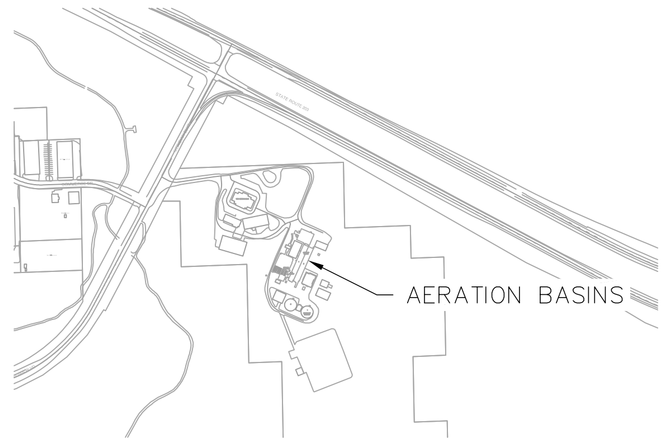
AERATION BASIN SECTION VIEW



AERATION BASIN NOTES

1. INSTALL NEW 24" BUTTERFLY GATE AND ASSOCIATED MOUNTING AND OPERATING HARDWARE IN MIXED LIQUOR EFFLUENT CHANNEL. RELOCATE AIR DIFFUSER LINES AND NOTCH GRATES AS NECESSARY.
2. USE EXISTING BLANK FLANGED FITTINGS OR INSTALL NEW TAPS ON AIR TRUNK LINES FOR NEW AERATION GRIDS.
3. REMOVE EXISTING COARSE BUBBLE DIFFUSER ASSEMBLY, DROP PIPE, AND OTHER HARDWARE AS NECESSARY TO INSTALL NEW AERATION ZONES IN NORTH END OF TRAINS.
4. INSTALL 1 NEW 15'–0" AERATION GRID IN EACH SELECTOR ZONE PER SANITAIRE SPECIFICATIONS (SEE EXHIBIT D) AND PER HDR 2006 PLANS (SEE EXHIBIT G). EACH GRID WILL CONSIST OF: 4" CONTROL VALVE, DROP PIPE, PURGE SUMP ASSEMBLY, MANIFOLDS, AIR DISTRIBUTORS, DIFFUSER HOLDERS, AND MISC. SUPPORTS, O–RINGS, CLAMPS, AND MOUNTING HARDWARE. MCWD TO PROVIDE 9" DIFFUSER ELEMENTS AND RETAINING RINGS.
5. REPLACE (E) 36" SLIDE GATES WITH (N) WATERMAN SLIDE GATES AND ASSOCIATED MOUNTING AND OPERATING HARDWARE.
6. PROTECT (E) MIXERS AND ASSOCIATED HARDWARE. MIXERS MAY BE TEMPORARILY MOVED DURING CONSTRUCTION.
7. APPLY ZYPEX CONCENTRATE DRY–PAC OR PATCH'N PLUG TO CRACKS AND SLAB INTERFACE JOINTS, AND XYPEX CONCENTRATE SLURRY COAT TO SURFACES PER XYPEX PROCEDURES AND METHODS (SEE EXHIBIT C).
8. AERATION BASIN #1 CONCRETE REHABILITATION SCOPE IS WHOLE SURFACE AND JOINTS OF THE SOUTHERN FACE OF THE BASIN BELOW WATER DEPTH AND BOTTOM JOINTS EXTENDING NORTH 10 FEET.
9. SEE APPENDIX G FOR ORIGINAL ASBUILTS. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS.

ESTIMATED CONCRETE REPAIR QUANTITIES		
	CRACKS (LF)	SURFACES (SF)
AERATION BASIN #2	63	340
PIPE GALLERY	235	235
PRIMARY CLARIFIER #1	45	170
PRIMARY EFFLUENT CHANNEL	178	729
TOTAL	521	1474



AERATION BASIN NOTES:

- The aeration basins are an essential part of the MCWD Wastewater Treatment Plant (WWTP) activated sludge process. At least 1 of the aeration basins is required to be operational at all times.
- At the start of this project, only Aeration Basin #1 is online and operational.
- Trunk air lines, purge lines and valves, air control valves, and miscellaneous air and control conduits are located around the aeration basins. Extra attention must be taken to protect any existing components in the project area and to prevent construction debris from entering any online and operational WWTP facilities.
- Dewatering and cleaning are the responsibility of the contractor.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 2006 Record Drawings, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER NICHOLAS PATRICK HOLT No. 96285 CIVIL STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

AERATION BASINS CONSTRUCTION

2026 WWTP PROJECTS

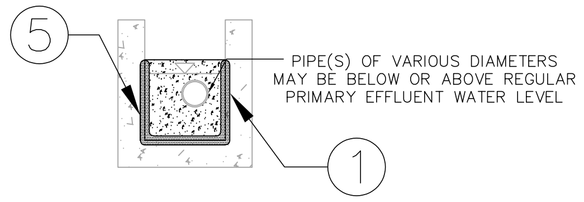
MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

MAMMOTH COMMUNITY WATER DISTRICT

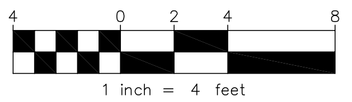
DRAWN: NPH
CHECKED: NPH
DATE: 9/23/2026
PROJECT NUMBER: 26WW13
SCAN NUMBER:
SHEET NO.: 4

4 OF 7 SHEETS

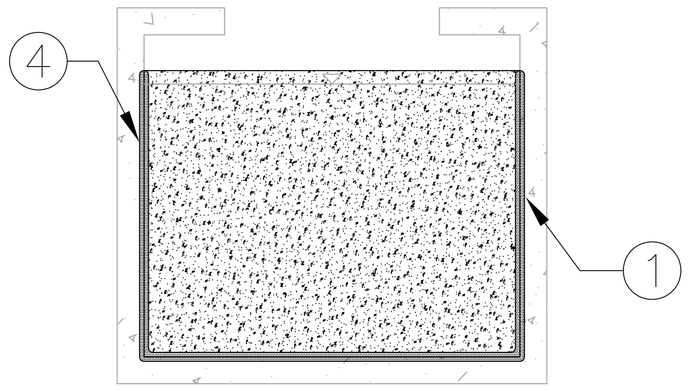
PRIMARY EFFLUENT TROUGH SECTION VIEW



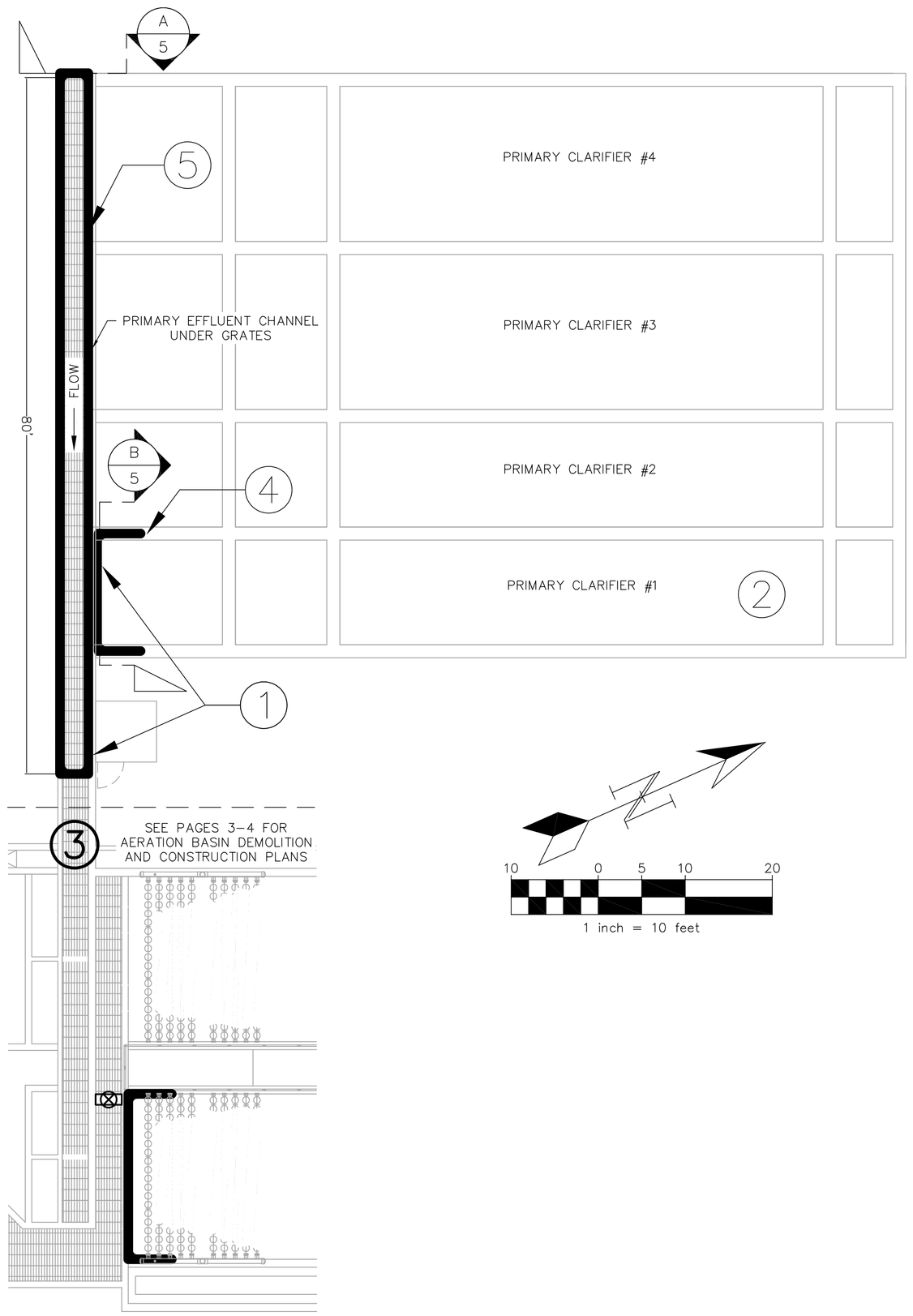
A/5 SECTION VIEW



PRIMARY CLARIFIER #1 SECTION VIEW



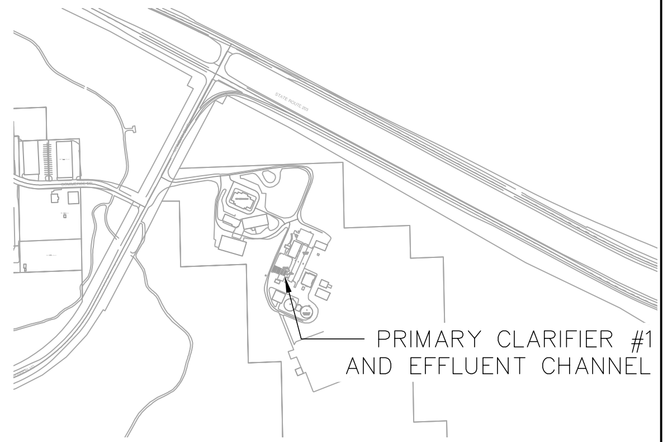
B/5 SECTION VIEW



PRIMARY CLARIFIER AND EFFLUENT CHANNEL NOTES

1. APPLY ZYPEX CONCENTRATE DRY-PAC OR PATCH'N PLUG TO CRACKS AND SLAB INTERFACE JOINTS, AND XYPEX CONCENTRATE SLURRY COAT TO SURFACES PER XYPEX PROCEDURES AND METHODS (SEE EXHIBIT C).
2. PRIMARY CLARIFIER #1 IS CURRENTLY OFFLINE.
3. PRIMARY EFFLUENT CHANNEL CONTINUOUSLY RECEIVES EFFLUENT FROM ONLINE PRIMARY CLARIFIER(S). PRIMARY EFFLUENT FLOWS MUST BE BYPASSED DURING CONCRETE REHABILITATION OF THE CHANNEL.
4. PRIMARY CLARIFIER #1 CONCRETE REHABILITATION SCOPE IS WHOLE SURFACE AND JOINTS OF THE SOUTHERN FACE OF THE CLARIFIER BELOW MAX WATER DEPTH AND JOINTS EXTENDING NORTH 5 FEET.
5. PRIMARY EFFLUENT CHANNEL CONCRETE REHABILITATION SCOPE IS WHOLE SURFACE AND JOINTS OF THE WESTERN FACE OF THE CHANNEL BELOW MAX WATER DEPTH AND BOTTOM AND SIDE SURFACES AND JOINTS EXTENDING EAST 80 FEET BELOW MAX WATER DEPTH.
6. SEE APPENDIX G FOR ORIGINAL ASBUILTS. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS. NOTE: PRIMARY CLARIFIER #1 WAS ORIGINALLY A CONSTRUCTED AS A SECONDARY CLARIFIER IN 1971 AND CONVERTED TO A PRIMARY CLARIFIER IN 1991.

ESTIMATED CONCRETE REPAIR QUANTITIES		
	CRACKS (LF)	SURFACES (SF)
AERATION BASIN #2	63	340
PIPE GALLERY	235	235
PRIMARY CLARIFIER #1	45	170
PRIMARY EFFLUENT CHANNEL	178	729
TOTAL	521	1474



SECONDARY CLARIFIER NOTES:

- The secondary clarifiers are an essential part of the MCWD Wastewater Treatment Plant (WWTP) activated sludge process. At least 1 of the secondary clarifiers is required to be operational at all times.
- At the start of this project, only Secondary Clarifier #2 is online and operational.
- Truck air lines, purge lines and valves, air control valves, and misc. air and control conduits are located around the aeration basins. Extra attention must be taken to protect any existing components in the project area and to prevent construction debris from entering any online and operational WWTP facilities.
- Dewatering, cleaning, and flow bypasses are the responsibility of the contractor.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 1993 Record Drawings, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER NICHOLAS PATRICK HOLT No. 96285 CIVIL STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

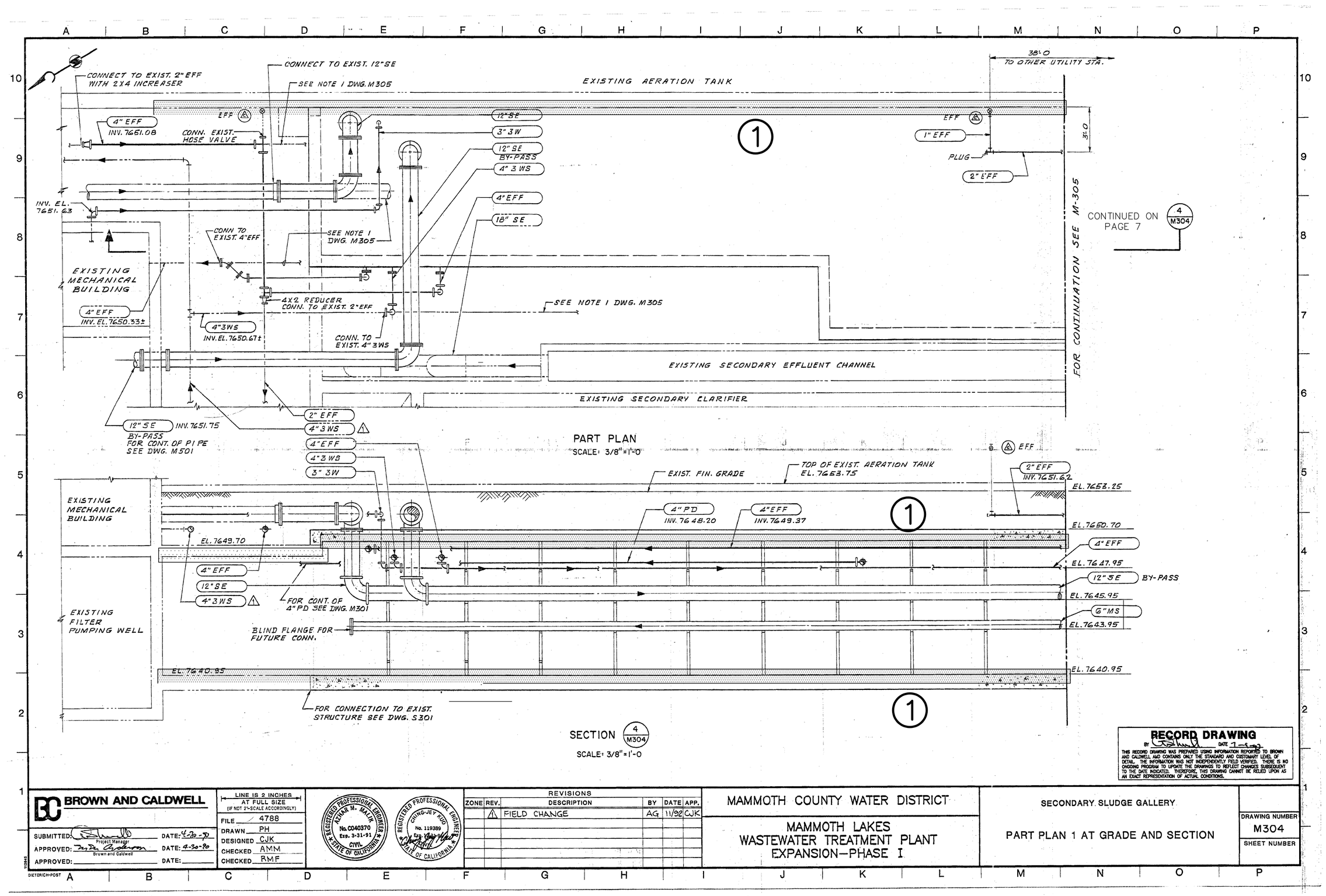
PRIMARY CLARIFIER AND EFFLUENT CHANNEL CONSTRUCTION

2026 WWTP PROJECTS

MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

DRAWN	NPH
CHECKED	NPH
DATE	9/23/2026
PROJECT NUMBER	26WW13
SCAN NUMBER	
SHEET NO.	5

5 OF 7 SHEETS



BROWN AND CALDWELL

SUBMITTED: Project Manager DATE: 4-30-26
APPROVED: Brown and Caldwell DATE: 4-30-26
APPROVED: DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"=SCALE ACCORDINGLY)
FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED AMM
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — No. C040370 — Exp. 3-31-91 — STATE OF CALIFORNIA — CIVIL
REGISTERED PROFESSIONAL ENGINEER — No. 119389 — STATE OF CALIFORNIA — CIVIL

REVISIONS				
ZONE	REV.	DESCRIPTION	BY	DATE APP.
	1	FIELD CHANGE	AG	11/22 CJK

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

SECONDARY SLUDGE GALLERY

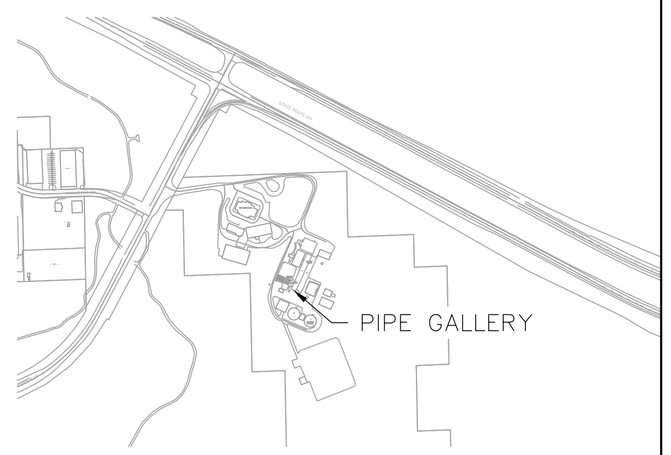
PART PLAN 1 AT GRADE AND SECTION

DRAWING NUMBER M304
SHEET NUMBER

PIPE GALLERY NOTES

1. APPLY ZYPEX CONCENTRATE DRY-PAC OR PATCH'N PLUG TO CRACKS AND SLAB INTERFACE JOINTS, AND XYPEX CONCENTRATE SLURRY COAT TO SURFACES PER XYPEX PROCEDURES AND METHODS (SEE EXHIBIT C).
2. PIPE GALLERY CONTAINS NUMEROUS ESSENTIAL COMPONENTS TO MCWD WWTP SUCH AS PIPES, PUMPS, SENSORS, CONTROLS, CONDUITS, ETC. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO PROTECT AND PROVIDE ACCESS TO THESE COMPONENTS IN THE PIPE GALLERY.
3. PIPE GALLERY CONCRETE REHABILITATION SCOPE IS ALL JOINTS OF THE SOUTHERN WALL BY THE SPIRAL STAIRCASE AND THE FLOOR AND CEILING JOINTS OF THE EASTERN WALL NEXT TO AERATION BASIN #2 EXTENDING NORTH 100 FEET.
4. SEE APPENDIX G FOR ORIGINAL ASBUILTS. CONTRACTOR TO VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS.

ESTIMATED CONCRETE REPAIR QUANTITIES		
	CRACKS (LF)	SURFACES (SF)
AERATION BASIN #2	63	340
PIPE GALLERY	235	235
PRIMARY CLARIFIER #1	45	170
PRIMARY EFFLUENT CHANNEL	178	729
TOTAL	521	1474



PIPE GALLERY NOTES:

- The Pipe Gallery houses numerous pipes, pumps, sensors, conduits, and other essential equipment to the MCWD Wastewater Treatment Plant (WWTP). These components must remain powered and active to maintain 100% uptime at the WWTP.
- Pipes, conduit, electrical and low-voltage control wiring, and lighting may be encountered near the concrete locations identified for rehabilitation and are not to be disturbed. Suitable protection from demolition, and construction activities is to be provided during construction to protect these components.
- Pipe Gallery is accessed from multiple stairways and is below grade. Contractor to provide suitable atmospheric controls suitable for concrete rehabilitation work and curing.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 1992 plans excerpted on pages 6 and 7 of this plan set, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER — NICHOLAS PATRICK HOLT — No. 96285 — CIVIL — STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

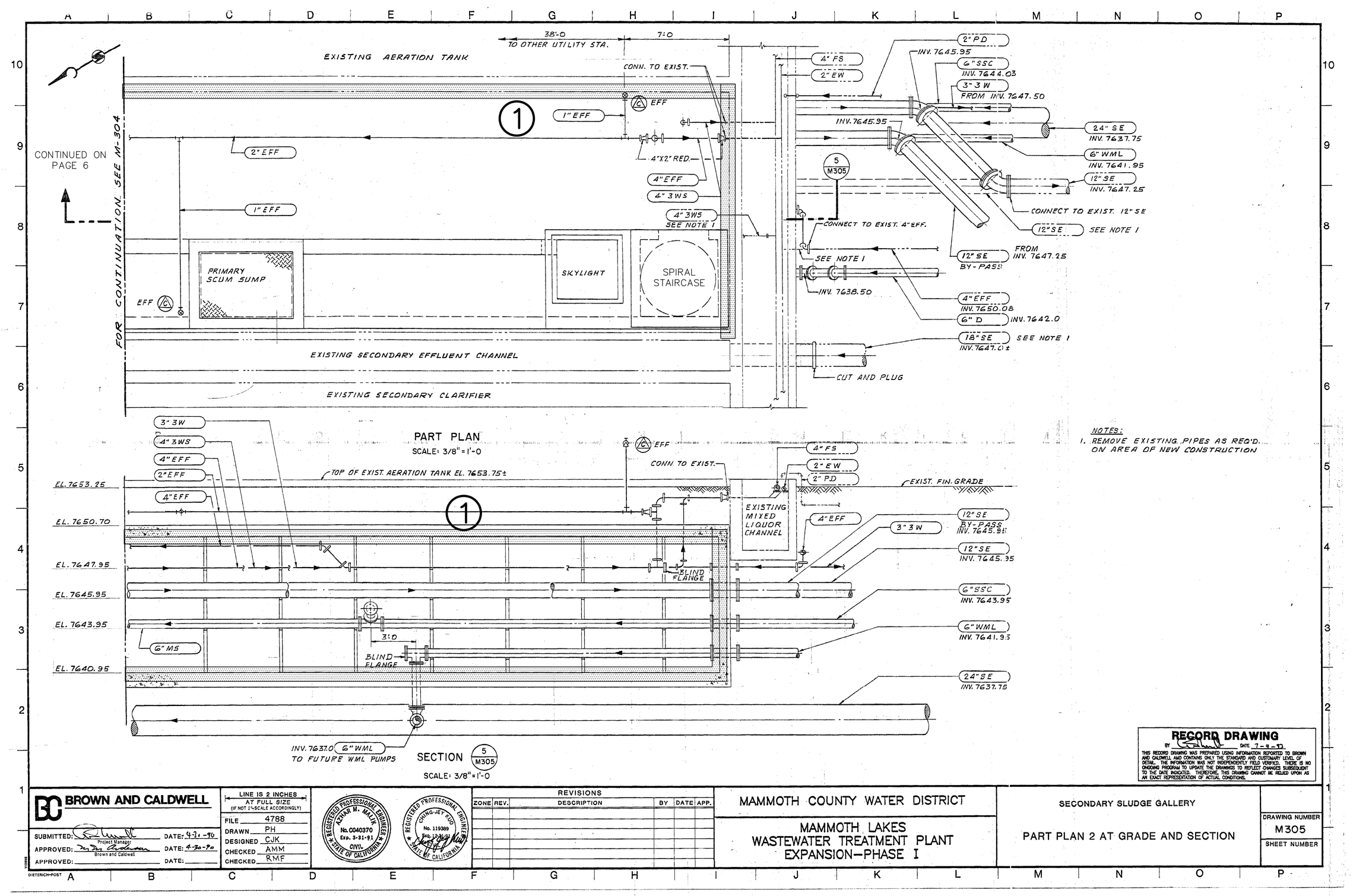
PIPE GALLERY CONSTRUCTION 1

2026 WWTP PROJECTS

MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

MAMMOTH COMMUNITY WATER DISTRICT

DRAWN NPH
CHECKED NPH
DATE 9/23/2026
PROJECT NUMBER 26WW13
SCAN NUMBER
SHEET NO. 6
6 OF 7 SHEETS



PIPE GALLERY NOTES

1. APPLY ZYPEX CONCENTRATE DRY–PAC OR PATCH'N PLUG TO CRACKS AND SLAB INTERFACE JOINTS, AND XYPEX CONCENTRATE SLURRY COAT TO SURFACES PER XYPEX PROCEDURES AND METHODS (SEE EXHIBIT C).
2. PIPE GALLERY CONTAINS NUMEROUS ESSENTIAL COMPONENTS TO MCWD WWTP SUCH AS PIPES, PUMPS, SENSORS, CONTROLS, CONDUITS, ETC. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO PROTECT AND PROVIDE ACCESS TO THESE COMPONENTS IN THE PIPE GALLERY.
3. PIPE GALLERY CONCRETE REHABILITATION SCOPE IS ALL JOINTS OF THE SOUTHERN WALL BY THE SPIRAL STAIRCASE AND THE FLOOR AND CEILING JOINTS OF THE EASTERN WALL NEXT TO AERATION BASIN #2 EXTENDING NORTH 100 FEET.
4. SEE APPENDIX G FOR ORIGINAL ASBUILTS. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS.

ESTIMATED CONCRETE REPAIR QUANTITIES		
	CRACKS (LF)	SURFACES (SF)
AERATION BASIN #2	63	340
PIPE GALLERY	235	235
PRIMARY CLARIFIER #1	45	170
PRIMARY EFFLUENT CHANNEL	178	729
TOTAL	521	1474

PIPE GALLERY NOTES:

- The Pipe Gallery houses numerous pipes, pumps, sensors, conduits, and other essential equipment to the MCWD Wastewater Treatment Plant (WWTP). These components must remain powered and active to maintain 100% uptime at the WWTP.
- Pipes, conduit, electrical and low-voltage control wiring, and lighting may be encountered near the concrete locations identified for rehabilitation and are not to be disturbed. Suitable protection from demolition, and construction activities is to be provided during construction to protect these components.
- Pipe Gallery is accessed from multiple stairways and is below grade. Contractor to provide suitable atmospheric controls suitable for concrete rehabilitation work and curing.
- See Exhibits A - G for additional specifications, reference drawings, and AsBuilts.
- While existing conditions are believed to be as shown in the 1992 plans excerpted on pages 6 and 7 of this plan set, Contractor is to verify relevant field conditions as necessary.

Submitted By:

REGISTERED PROFESSIONAL ENGINEER NICHOLAS PATRICK HOLT No. 96285 CIVIL STATE OF CALIFORNIA

Nicholas P. Holt
R.C.E. # 96285
EXP: 9/30/28

REVISIONS	DATE	BY

PIPE GALLERY CONSTRUCTION 2

2026 WWTP PROJECTS

MAMMOTH COMMUNITY WATER DISTRICT
P.O.Box 597 Mammoth Lakes, CA 93546
(760) 934-2596 FAX: (760) 934-2143

DRAWN NPH

CHECKED NPH

DATE 9/23/2026

PROJECT NUMBER 26WW13 | SCAN NUMBER

SHEET NO. 7

7 OF 7 SHEETS

EXHIBIT C

XYPEX CONCRETE REHABILITATION SPECIFICATIONS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Lakes, CA

XYPEX® Method Statement

CONCRETE COATING INSTALLATION AND PROCEDURES

General Information & Standard Xypex Coating Installation Procedures for Use on Concrete

2022-07-20

The following are general directions on the installation and use of Xypex Concentrate and Modified coatings for Xypex modification of poured in place concrete elements. The information presented is in addition to Xypex product data sheets and is not meant to replace these or any other installation guides but rather is meant to give a general description of the installation practices, curing procedures and other information surrounding the use of Xypex products for waterproofing and protecting concrete and while they normally provide an acceptable final appearance they are not meant as aesthetic finishes.

Weather and Concrete Conditions

1. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40ºF (4ºC).

2. Because Xypex requires water as a diffusion medium and to initiate the crystalline waterproofing process, all concrete, whether fresh or old, must be in a saturated surface dry (SSD) condition prior to coating application. (See Wetting Concrete below.)

3. The concrete surface must be a minimum of 20 hours old before application of the Xypex coating treatment.

4. For fresh concrete, the period between 24 hours and 72 hours is the optimum time within which to apply Xypex, as the new concrete is still “green” and requires very little pre-watering.

Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m^2). Where a single heavy coat is to be used the coverage rate is 2.0 lb./sq.yd. (1.0 kg/m^2).

Surface Preparation

1. The concrete surface to be treated must be clean and free of laitance, dirt, film, paint, coatings or other foreign matter. The surface must also have an open capillary system to provide “tooth and suction” for the Xypex treatment. A CSP-3 per the International Concrete Repair Institute Guidelines and Surface Profile Chips is recommended.

2. If surface is too smooth (e.g. where steel forms are used) or if surface is covered with excess form oil or other foreign matter, the concrete should be lightly sand-blasted, water-blasted, or etched with acid.

3. Horizontal surfaces should have a rough wood float or broom finish. Concrete laitance must be removed from surface by light sand-blasting, water-blasting or etching with acid.

4. Surfaces to be etched with acid should be dampened with water before application of the acid. After acid etching flush concrete thoroughly with clean water.

Repairs Prior to Coating Application

For cracks larger than 0.02” (0.5 mm) or for actively leaking cracks the following repair procedures are recommended.

1. Chip out cracks, faulty construction joints and other structural defects to a depth of 1.5” (37 mm) and a width of one inch (25 mm). A “V” shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage.

2. Clean slot, wet concrete and apply a brush coat of Xypex Concentrate (as described below) in cavity and allow to dry for 10 minutes.

3. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block. (See below for Dry-Pac mixing instructions.)

4. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch’n Plug in lieu of Dry-Pac followed by a brush coat of Xypex Concentrate. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

All areas of poor concrete consolidation (honeycomb or rock pockets) should also be repaired. Refer to Xypex Method Statements (www.xypex.com) or contact Xypex’s Technical Services Department or your local Xypex Technical Services Representative for more information.

Wetting Concrete

Xypex requires a saturated substrate and a dry surface. This is commonly referred to as a saturated surface dry or SSD condition. SSD concrete will not absorb any more water but has no glistening water on the surface. Concrete surfaces, therefore, must be thoroughly saturated

with clean water prior to the application so as to aid the proper diffusion of the Xypex chemistry and to ensure the growth of the crystalline formation deep within the pores of the concrete. Remove excess water before the application such that there is no glistening water on the surface. If concrete dries out before application, it must be re-wetted.

Mixing

1. Mix Xypex with clean water only (potable water that is free of salt and other deleterious materials).

2. Mix Xypex powder into the clean water with a paddle on a slow speed electric drill (250 RPM) or with other equipment that ensures adequate mixing. For small jobs, Xypex may be mixed by gloved hand or by trowel.

3. Be sure that the quantity mixed can be applied within 20 minutes. As the mixture thickens, stir briefly to refluidize the mix but do not add water.

Mixing For Slurry Coat

Mix Xypex powder with clean water to a creamy consistency in the following volume proportions:

For Brush Application
1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m^2)
5 parts powder to 2 parts water

2.0 lb./sq.yd. (1.0 kg/m^2)
3 parts powder to 1 part water

For Spray Application
1.25 - 1.5 lb./sq.yd. (0.65 - 0.8 kg/m^2)
5 parts powder to 3 parts water
(ratio may vary with equipment type)

Mixing Dry-Pac

Using a trowel, mix one part clean water with six parts Xypex Concentrate powder by volume for 10 - 15 seconds. Lumps should be present in this mixture. Do not mix more than can be applied in 20 minutes.

Applying Xypex

1. Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces), or specialized spray equipment. Do not apply Xypex with a trowel, roller, paintbrush or paint sprayer. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative for further information.

2. The Xypex coating must be uniformly applied and should be just under 1/16" (1.25 mm) thick. A thicker coating can cause curing or other difficulties, especially in warm weather.

3. When a second coat (Xypex Concentrate or Modified) is required, it should be applied after the first coat has reached an initial set but while it is still "green" (less than 48 hours). Curing by misting the coating with water should be done between coats. Ensure first coat is in SSD condition before application of the second coat.

4. For slab (horizontal) applications, care should be taken to spread the Xypex evenly, pulling a heavy broom over the fresh Xypex. This should be done in long strips and will serve to eliminate settlement of the Xypex in low spots on the slab and also to remove excess material which may have been applied.

5. In hot weather it is advisable to apply Xypex either early in the morning or late in the day. This will prevent the Xypex coating from drying out too quickly.

Note: Where a smooth, steel-trowelled finish is required for horizontal slab or where slab will be exposed to traffic (e.g. parking deck), apply Xypex Concentrate DS-1 or DS-2 by dry shake method. The wearability of Xypex Concentrate and Modified can be improved through an application of Xypex Quickset after the coatings have been cured and dried. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative for further information.

Curing

1. Generally a misty fog spray of clean water is used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water.

2. Under normal conditions, it is sufficient to spray Xypex treated surfaces three times per day for 2 - 3 days. In hot or arid climates, spraying may be required more frequently to prevent premature drying of the coating. Wet burlap and some specialty curing blankets are also effective for curing. If plastic sheeting is used as protection, it must be raised off the Xypex treatment to allow the coating to breathe.

3. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36°F (2°C) for a period of not less than 48 hours after application.

CONCRETE COATING INSTALLATION AND PROCEDURES

General Information & Standard Xypex Coating Installation Procedures for Use on Concrete

4. For concrete structures that hold liquids (e.g. swimming pools, reservoirs, wet wells, tanks, etc.), Xypex should be cured for three days and then allowed to set for 12 days before filling the structure with liquid.

5. For structures holding particularly hot and/or corrosive liquids, Xypex should be cured for three days and allowed to set for 18 days before filling.

6. In situations where there is very high humidity and poor air circulation (e.g. small, enclosed reservoirs or wet wells), fans or blown air to create air movement within the space may be necessary to aid the curing of Xypex.

7. Xypex Gamma Cure may be used in lieu of water curing for certain applications: contact Xypex's Technical Services Department or your local Xypex Technical Services Representative. Gamma Cure should be applied using a garden type sprayer and must be diluted as per directions before use. Do not apply more Gamma Cure than is specified.

Backfilling

Backfilling can take place 36 hours after the Xypex application. If backfilling takes place within seven days after the application, the backfilling material should be moist so as not to draw moisture from the Xypex coating.

Application of Paints, Epoxies or Similar Coatings

Xypex requires a minimum of 21 days of curing and crystal generation before the application of any paint or epoxy. Consult epoxy and paint manufacturer for additional coating instructions and restrictions. Removal of the Xypex coating by high pressure washing or abrasive blasting following full curing is the best practice. Alternately, moderate pressure washing, light abrasive blasting or washing the Xypex surface with a 3 - 5% muriatic acid solution followed by a rigorous rinse with clean water is recommended before applying the coating. Be sure to flush all acid off the surface. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Application of Grout, Cement Parge Coat, Plaster or Stucco

It is recommended that any other cementitious system be applied over the Xypex coating after the Xypex has completely set but while it is still "green" (8 to 48 hours). The 12 to 24 hour window is considered ideal. applications: Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative regarding surface preparation and other procedures for installations of other materials onto Xypex coatings older than 48 hours. Use of a polymer additive to help improve bond in the over coating mortar mix should be considered. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Note: Xypex Chemical Corporation makes no representations or warranties regarding the compatibility of Xypex products with plasters, stuccos, tiles and other surface applied materials. It is the responsibility of the installer of these surface-applied materials to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the Xypex treated surface.

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation.

Caution

Xypex is highly alkaline.

1. Avoid contact with skin or eyes.

2. Protect hands with rubber gloves when handling dry powder or wet mixture.

3. If skin comes into contact with Xypex material, wash immediately and thoroughly with water for 15 minutes. If discomfort continues, seek prompt medical attention.

4. Wear eye protection. If dry powder or wet mixture gets into eyes, flush immediately and thoroughly with water and seek medical aid.

5. Wear a suitable mask where there is potential for generating dust. If Xypex is ingested, do not induce vomiting; have affected person drink two glasses of water and obtain immediate medical attention.

6. For Safety Data Sheets, contact Xypex Chemical Corporation at 604.273.5265, toll-free 800-961-4477 or refer to SDS located at: www.xypex.com.

XYPEX® CONCENTRATE

CEMENTITIOUS CRYSTALLINE

Concrete Waterproofing

Description

Xypex is a unique chemical treatment for the waterproofing, protection and repair of concrete. XYPEX CONCENTRATE consists of Portland cement, finely graded sand and active proprietary chemicals; it is applied as a cementitious slurry to the pre-saturated surface of existing above and belowgrade structures. The active chemicals diffuse into the substrate and react with moisture and the constituents of hardened concrete to cause a catalytic reaction. This reaction generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete, as well as cracks, permanently sealing the concrete and preventing the penetration of water and other liquids from any direction, even under high hydrostatic pressure. Xypex Concentrate is also mixed in a Dry-Pac form for sealing strips at construction joints, or for the repairing of leaking cracks, faulty construction joints and other defects.

Recommended for:

- Reservoirs
- Sewage and Water Treatment Plants
- Underground Vaults
- Secondary Containment Structures
- Foundations
- Tunnels and Subway Systems
- Swimming Pools
- Parking Structures

Advantages

- Resists extreme hydrostatic pressure
- Becomes an integral part of the substrate
- Can seal static hairline cracks up to 0.5 mm
- Can be applied to the positive or the negative side of the concrete surface
- Allows concrete to breathe
- Highly resistant to aggressive chemicals
- Non-toxic / no VOCs
- Does not require a dry surface
- Cannot puncture, tear or come apart at the seams
- No costly surface priming or leveling prior to application
- Does not require sealing, lapping and finishing of seams at corners, edges or between membranes
- Does not require protection during backfilling or during placement of steel, wire mesh or other materials
- Less costly to apply than most other methods
- Not subject to deterioration
- Permanent

For assistance with project requirements, please contact Xypex Technical Services Department.

Packaging

Xypex Concentrate is available in 20 lb. (9.1 kg) pails, 50 lb. (22.7 kg) pails and bags.

Storage

Xypex products must be stored dry at a minimum temperature of 45ºF (7ºC). Shelf life is two years when stored under proper conditions.

Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 6 - 7.2 sq. ft./lb. (1.25 - 1.5 lb./sq. yd. or 0.65 - 0.8 kg/m^2).

Test Data

PERMEABILITY

U.S. Army Corps of Engineers (USACE) CRD C48, "Permeability of Concrete", Pacific Testing Labs, Seattle, USA

Two in. (51 mm) thick, 2000 psi (13.8 MPa) Xypex-treated concrete samples were pressure tested up to a 405 ft. (124 m) water head (175 psi/1.2 MPa), the limit of the testing apparatus. While untreated samples showed marked leakage, the Xypex-treated samples (as a result of the crystallization process) became totally sealed and exhibited no measurable leakage.

DIN 1048 (equivalent to EN 12390-8), "Water Impermeability of Concrete", Bautest – Corporation for Research & Testing of Building Materials, Augsburg, Germany

Twenty cm thick Xypex-treated concrete samples were pressure tested up to 7 bars (230 ft./70 m water head) for 24 hours to determine water impermeability. While the reference specimens measured water penetration up to a depth of 92 mm, Xypex-treated samples measured water penetration of zero to an average of 4 mm.

EN 12390-8, "Depth of Water Penetration on Samples Treated with Concentrate Coating", OL-123, Czech Technical University, Prague, Czech Republic

Three replicate 150 mm concrete cubes from four different mix designs (strength classes) were coated with Xypex Concentrate at a thickness of 0.8 mm to 1 mm. Controls for each of the different mix designs were also cast for comparison purposes. All samples were exposed to 0.5 MPa (73 psi) of water pressure for 72 hours from the opposite side of the treated surface. Specimens from each set were split transversely from the treated surface at 28 and 91 days to measure depth of water penetration from the exposed surface. After 28 days, the Xypex coating

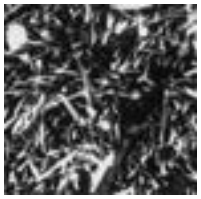
reduced the depth of water penetration by 90 to 94% compared to the control mixes for the four mix types. At 91 days all Xypex-treated samples measured <1 mm of water penetration.

DEPTH OF PENETRATION

"Measurement of Mass Concrete Humidity", Czech Technical University, (CVUT) Faculty of Civil Engineering, Prague, Czech Republic

A coating of Xypex Concentrate was applied to one face of a 300 mm x 300 mm x 220 mm set of concrete blocks; two replicate sets of blocks were left untreated. Water filled containers were tightly sealed onto the opposite face of the treated blocks and one set of the untreated blocks while the third untreated block set was kept in the laboratory as a control. Humidity probes were installed in 6 mm diameter holes that were drilled to within 30 - 40 mm of the water exposed surface. Mass humidity was recorded at intervals of 28, 45, 90, 125 and 132 days. Final results showed that the Xypex-treated specimens had an average humidity reading of 4.6%, the untreated sample measured 7.9% and the control block with no water exposure was 4.4%, essentially equivalent to the Xypex specimens' results. The Xypex reactive chemicals had diffused at least 190 mm in 132 days.

"An Enhancement in the Nature of Concrete with a Multiplicative Cement Crystal-Type Concrete Material", Central Research Laboratory of Nikki Shoji in Association with Hosei University, Japan



A 60 cm x 70 cm x 40 cm concrete block was cast and a Concentrate coating was applied to the surface and cured. The block was left outdoors for approximately 1 year. Subsequently, a 40 cm (15.75 in.) long cylinder was then cored perpendicular to the Xypex treatment and cut into 18 slices of equal length. SEM photographs utilizing a 1000x magnification were taken of slices from various depths from the treated surface to determine the extent of crystalline growth. While the crystalline structure was most dense in specimens located closest to the treated surface, there was evidence of the crystalline structure at 30 cm (12 inches) from the treated surface.

CRACK SEALING

ASTM C856 "Standard Practice for Petrographic Examination of Hardened Concrete", Setsco Services Pte, Ltd., Singapore

A coat of Xypex Concentrate was applied to a slab that had developed numerous hairline cracks. To determine the crack sealing ability of the Xypex treatment, cores were extracted from a slab at 3, 10, 14 and 20 days following application. Thin sections were taken from each core in order to examine hairline cracks utilizing a polarizing and fluorescent microscope (PFM). In each case, there was evidence of the Xypex crystalline structure in the cracks to a depth of about 20 mm. Photographs taken this depth at 100x magnification showed the Xypex crystalline structure had reduced the width of the cracks dramatically.

TENSILE BOND STRENGTH

EN 1542 "Products and Systems for the Protection and Repair of Concrete Structures – Test Methods – Measurement by Pull-off", Trow Associates Inc., Burnaby, B.C., Canada

Two coats of Xypex Concentrate were applied at 0.8 kg per m^2 with a total cured thickness of 0.9 mm to a standard concrete substrate meeting EN 1766 MC (0,40) (meeting ICRI CSP-4). The coating was applied and cured to the manufacturer's technical specifications and tested at 30 days age for bond strength. The average tensile bond strength of five replicates was 1.23 MPa.

CHEMICAL RESISTANCE

ASTM C 267, "Chemical Resistance to Mortars", Pacific Testing Labs, Seattle, USA

Xypex-treated cylinders and untreated cylinders were exposed to hydrochloric acid, caustic soda, toluene, mineral oil, ethelyne glycol, pool chlorine, brake fluid and other chemicals. Results indicated that chemical exposure did not have any detrimental effects on the Xypex coating. Tests following chemical exposure measured an average 17% higher compressive strength in the Xypex-treated specimens over the untreated control samples.

IWATE University Technical Report, "Resistance to Acid Attack", Tokyo, Japan

Before Immersion *After 5 Weeks* *After 10 Weeks*

Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H_2SO_4 solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

ASTM C876 "Influence of Xypex Coating System on Residual Service Life of Concrete Structures" Durability Assessment Section, Xypex Australia

A bridge pier exposed to seawater in a tidal splash zone for over 40 years experienced different types of deterioration mechanisms including surface abrasion (skin loss), cracking, and corrosion of steel reinforcement. Corrosion monitoring was conducted before and six months after application of Xypex Concentrate. This non-destructive testing (NDT) included a measurement

of the corrosion rate, corrosion potential, and concrete resistivity. Results indicated a reduction of corrosion rate and corrosion potential up to 50% and 40% respectively, and significant enhancement of the concrete resistivity.

RILEM CPC-18 "Carbonation Resistance of Samples Treated with a Xypex Concentrate Coating", Construction and Maintenance Technology Research Center (CONTEC), Sirindhorn International Institute of Technology (SIIT) – Thammasat University, Bangkok, Thailand

Control and Xypex Concentrate coated samples were carbonated in an accelerated carbonation chamber. The average depths of carbonation were measured at 28, 56, 77 and 91 days. The depth of carbonation of these Xypex Concentrate coated samples was reduced by 35 - 40% compared to the controls. Following initial carbonation, one set of samples was coated with Xypex Concentrate to model old concrete already damaged by carbonation. For these specimens, testing indicated that carbonation was arrested and in one specimen reduced.

FREEZE/THAW DURABILITY

ASTM C 672, "Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to De-Icing Chemicals", Twin City Testing Lab, St. Paul, USA

Xypex-treated samples restricted chloride ion concentration to below the level necessary to promote electrolytic corrosion of reinforcing steel. Visual examination of untreated panels after 50 freeze/thaw cycles showed a marked increase in surface deterioration compared to Xypex-treated samples.

POTABLE WATER EXPOSURE

NSF 61, "Drinking Water System Component-Health Effects", NSF International, Ann Arbor, USA

Exposure testing of potable water in contact with Xypex-treated samples indicated no harmful effects.

RADIATION RESISTANCE

U.S.A. Standard No. N69, "Protective Coatings for the Nuclear Industry", Pacific Testing Labs, Seattle, USA

After exposure to 5.76 x 10^4 rads of gamma radiation, the Xypex treated specimens displayed no ill effects or damage.

Application Procedures

1. SURFACE PREPARATION Concrete surfaces to be treated must be clean and free of laitance, dirt, film, paint, coating or other foreign matter. Surfaces must also have an open capillary system to provide "tooth and suction" for the Xypex treatment. A CSP-3 per the International Concrete Repair Institute Guidelines and Surface Profile Chips is recommended. If surface is too smooth (e.g. where steel forms are used) or covered with excess form oil or other foreign matter, the concrete should be lightly sandblasted, waterblasted, or etched with muriatic (HCL) acid.

2. STRUCTURAL REPAIRS – PRIOR TO COATING APPLICATION For cracks larger than 1/64" (0.5 mm) or for actively leaking cracks the following repair procedures are recommended. Chip out cracks, faulty construction joints and other structural defects to a depth of 1.5 inches (37 mm) and a width of 1 inch (25 mm). A "V" shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage. Clean and wet the slot and apply a brush coat of Xypex Concentrate as described in steps 5 & 6 and allow to dry for 10 minutes. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block.

NOTE:

i. Areas of poor concrete consolidation that show evidence of leakage should also be repaired.

ii. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch'n Plug, then Xypex Dry-Pac followed by a brush coat of Xypex Concentrate.

iii. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

3. WETTING CONCRETE Xypex requires a saturated surface dry (SSD) condition. Concrete surfaces must be thoroughly saturated with clean water prior to the application so as to aid the diffusion of the Xypex chemistry and to ensure growth of the crystalline formation deep within the pores of the concrete. Remove excess water before the application such that there is no glistening water on the surface. If concrete dries out before application, it must be re-wetted.

4. MIXING FOR SLURRY COAT Mix Xypex powder with clean water to a creamy consistency in the following proportions:

For Brush Application
1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m^2)
5 parts powder to 2 parts water

2.0 lb./sq. yd. (1.0 kg/m^2)
3 parts powder to 1 part water

For Spray Application
1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m^2)
5 parts powder to 3 parts water
(ratio may vary with equipment type)

Do not mix more Xypex material than can be applied in 20 minutes. As the mixture thickens, stir briefly to ensure

mixture remains fluid; but do not add water.

Mixing Dry-Pac
Using a trowel, mix 6 parts Xypex Concentrate powder by volume to 1 part clean water for 10 to 15 seconds. Lumps should be present in this mixture. Do not mix more than can be applied in 20 minutes.

5. APPLYING XYPEX Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces) or specialized spray equipment. The coating must be uniformly applied and should be just under 1/16 in. (1.25 mm). When a second coat (Xypex Concentrate or Xypex Modified) is required, it should be applied after the first coat has reached an initial set but while it is still "green" (less than 48 hours). Curing by misting the coating with water should be done between coats. Ensure first coat is in SSD condition before application of the second coat. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40ºF (4ºC). Avoid application of the Xypex coating in hot and windy conditions as the coating may dry out prematurely. For recommended equipment, contact Xypex's Technical Services Department or your local Xypex Representative.

6. CURING Generally a misty fog spray of clean water is used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water. Under normal conditions, it is sufficient to spray Xypex-treated surfaces three times per day for two to three days. In hot or arid climates, spraying may be required more frequently. Wet burlap and some specialty curing blankets are also effective for curing. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36ºF (2ºC) for a period of not less than 48 hours after application. If plastic sheeting is used as protection, it must be raised off the Xypex to allow the coating to breathe. Xypex Gamma Cure may be used in lieu of water curing for certain applications, consult with Xypex's Technical Services Department or your local Xypex Representative.

NOTE:
i. For concrete structures that hold liquids (e.g. reservoirs, swimming pools, tanks, etc.), Xypex should be cured for three days and allowed to set for 12 days (18 days for waste water or corrosive solutions) before filling the structure with liquid.

ii. For Xypex coated slabs that will be a wearing surface, an application of Xypex Quickset after the coating has been cured and dried is recommended. Contact your local Xypex Representative for assistance.

iii. If any other cementitious system is applied over the Xypex coating, it should be after the coating has completely set but while it is still green (12 to 48 hours); the 12 to 24 hour window is considered ideal. For installations onto a Xypex coating older than 48 hours contact your local Xypex Representative regarding surface preparation and application recommendations. Xypex Chemical Corporation makes no representations or warranties regarding the compatibility of Xypex products with plasters, stuccos, tiles and other surface-applied materials. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

Technical Services

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex Representative.

Certification

Xypex Concentrate satisfies the requirements of EN 1504-2; Initial Type Testing (ITT) according to EN 1504-2 was certified by BSI as the Notifying Body.

Safe Handling Information

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex pails and packaging. The Manufacturer also maintains comprehensive and up-to-date Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex Representative to obtain copies of Safety Data Sheets prior to product storage or use.

Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

NSF
Certified to NSF/ANSI/CAN 61

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XYPEX®
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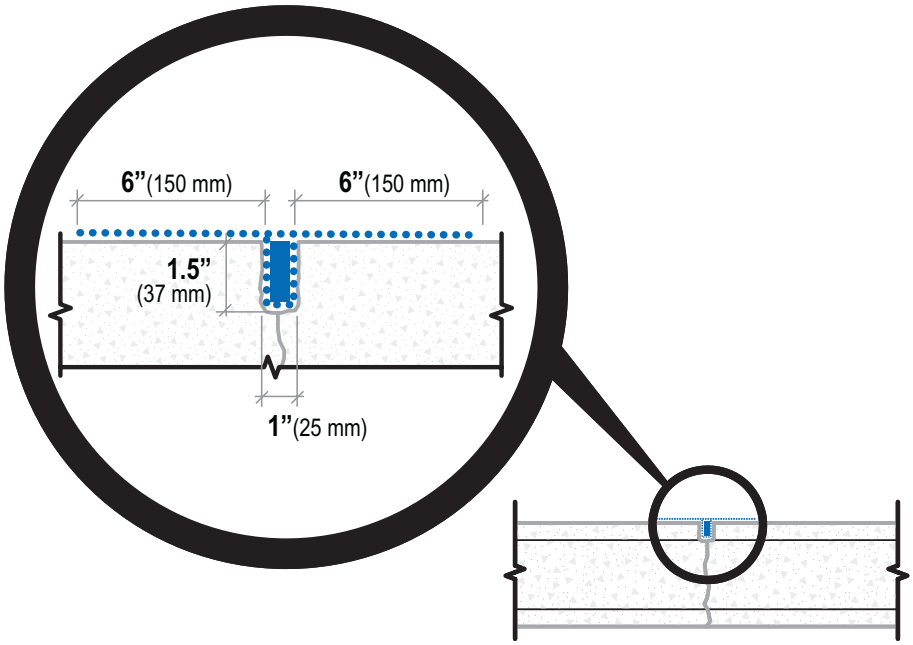
ISO 9001:2015
FM 63167

REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS

No Water Flow



CONCENTRATE SLURRY COAT
CONCENTRATE DRY-PAC

HYDROSTATIC PRESSURE – NO ACTIVE LEAKING WATER

Step 1
Rout out crack/joint in a “U” shaped slot 1” (25 mm) wide and at least 1.5” (37 mm) deep. A “V” shaped slot is not acceptable.

Step 2
Remove all loose material and saturate with water. Allow water to soak into concrete and then remove all surface water.

Step 3
Apply one slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) to slot and to 6” (150 mm) strip on either side of slot. Application may be performed by brush or gloved hand.

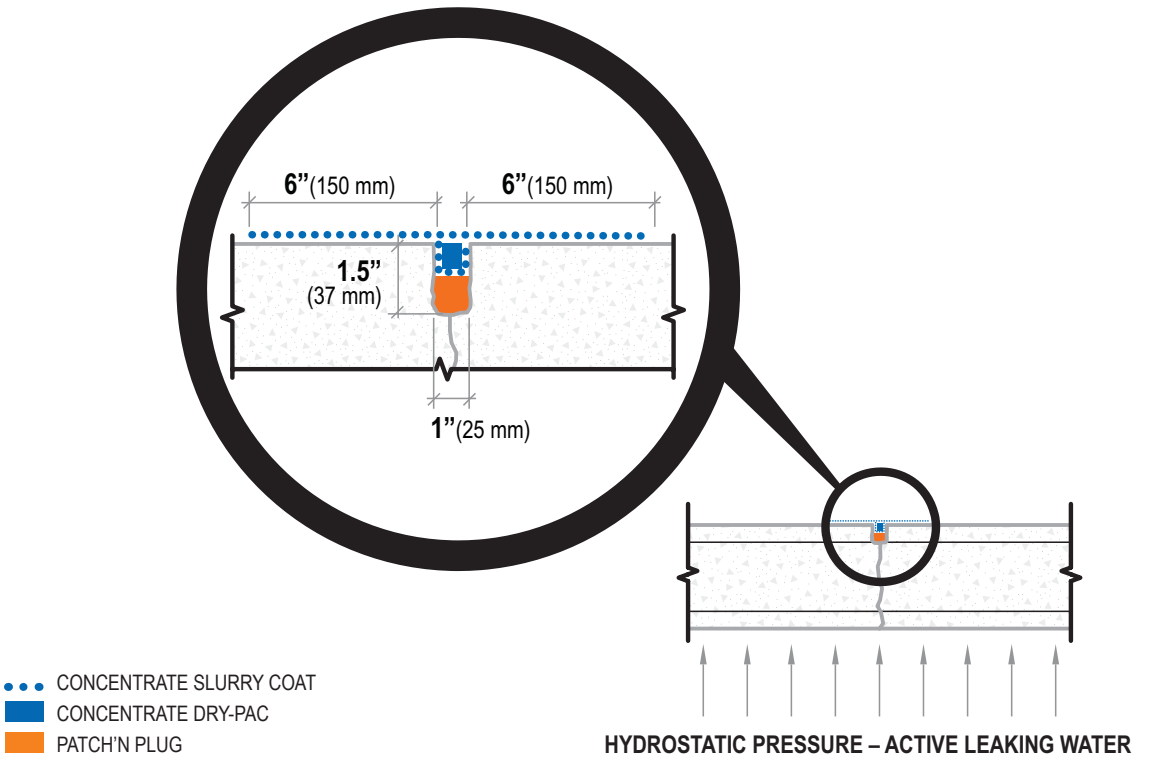
Step 4
While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, then compress it tightly using a pneumatic packing device or a hammer and block.

Step 5
Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6” (150 mm) strip on either side of slot.

Step 6
Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS

Against a Flow of Water



Step 1

Rout out crack/joint in a "U" shaped slot 1" (25 mm) wide and at least 1.5" (37 mm) deep. A "V" shaped joint is not acceptable. Areas with most water flow should be identified and chipped slightly deeper.

Step 2

Remove all loose material and saturate dry areas with water. Allow water to soak in and then remove all surface water.

Step 3

To stop active water flow apply Xypex Patch'n Plug to half the depth of slot immediately after removing surface water. Patch'n Plug is mixed by adding one part clean water to 3.5 parts Patch'n Plug powder by volume. Patch'n Plug should be applied to full length of crack/joint area.

Step 4

Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) in the slot over the Patch'n Plug and on the 6" (150 mm) strip of concrete surface on either side of the slot. Application may be performed by brush or gloved hand.

Step 5

While slurry coat is still tacky, fill slot to surface level with Xypex Concentrate Dry-Pac. Dry-Pac is mixed by adding one part clean water to six parts Xypex Concentrate powder by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in mixture). Apply the Dry-Pac by gloved hand, then compress it tightly by using a pneumatic packing tool or a hammer and block.

Step 6

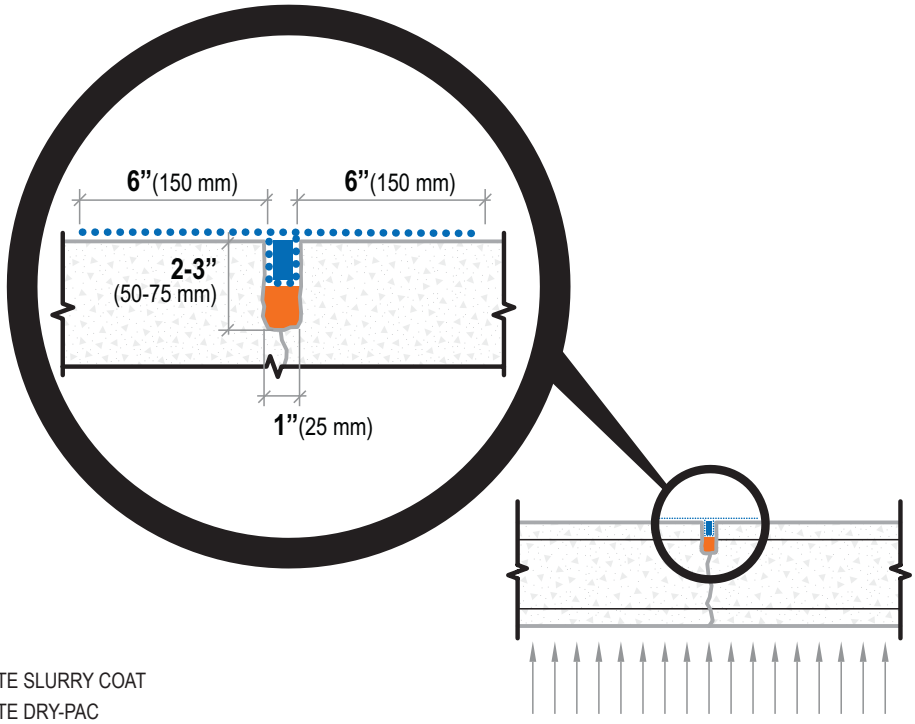
Wet the Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6" (150 mm) strip on either side of slot.

Step 7

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS

Against High Pressure Water Flow



CONCENTRATE SLURRY COAT
CONCENTRATE DRY-PAC
PATCH'N PLUG

HIGH HYDROSTATIC PRESSURE – ACTIVE LEAKING WATER

Step 1
Rout out crack/joint in a "U" shaped slot 1" (25 mm) wide and 2 - 3" (50 - 75 mm) deep. A "V" shaped slot is not acceptable.

Step 2
In area of greatest water flow, drill hole or cavity 0.5" (13 mm) deeper into slot to accommodate a bleeder hose. A bleeder hose is a minimum 1.5 foot (0.5 m) length of smooth surfaced, fairly rigid tubing. Its purpose is to relieve the water pressure while crack/joint is being repaired.

Step 3
Remove all loose material and saturate dry areas with water. Allow water to soak in and then remove all surface water.

Step 4
Place one end of bleeder hose into the hole or cavity and, while holding hose steady, apply Xypex Patch'n Plug to the slot around the hose. Approximately two to four applications of Patch'n Plug may be necessary to secure the hose in place and embed the tubing completely up to surface level.

Step 5
To stop active water flow apply Xypex Patch'n Plug to half the depth of remaining slot area. Patch'n Plug is mixed by adding one part clean water to 3.5 parts Patch'n Plug powder by volume. If slot has dried out before Patch'n Plug application, it should be re-wetted. Remove bleeder hose and pack hole with Xypex Patch'n' Plug to stop all active water flow.

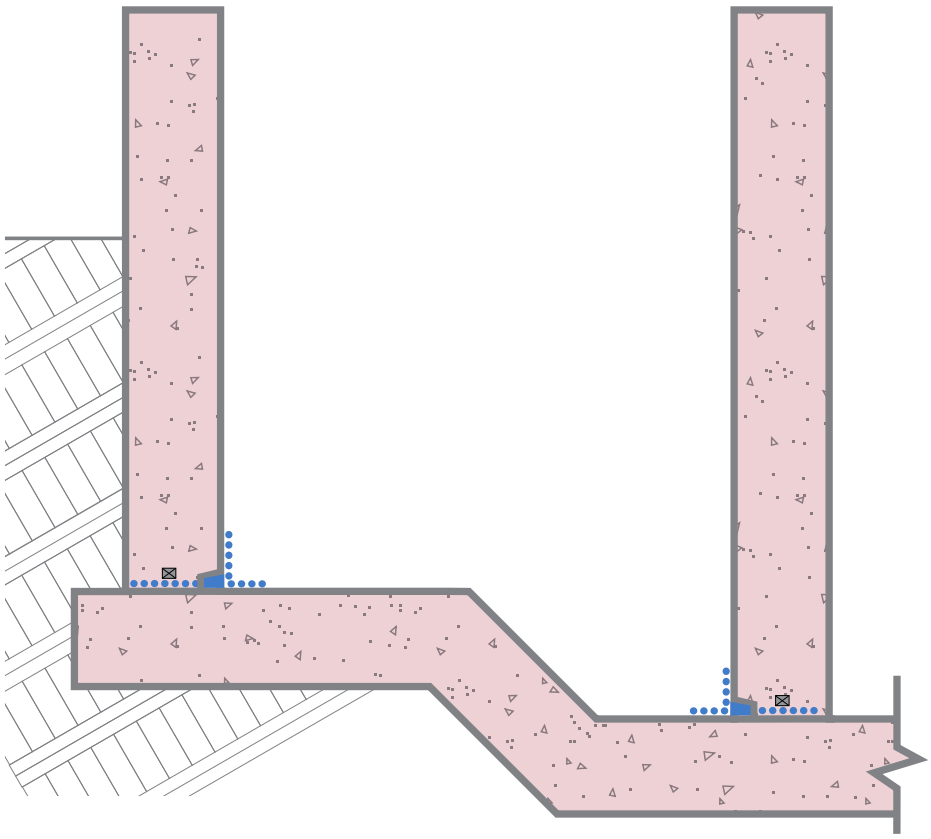
Step 6
Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) in the slot over the Patch'n Plug and on the 6" (150 mm) strip of concrete surface on either side of the slot. Application may be performed by gloved hand or by brush.

Step 7
While slurry coat is still tacky, fill slot to surface level with Xypex Concentrate in Dry-Pac consistency. Dry-Pac is mixed by adding one part clean water to six parts Xypex Concentrate powder by volume. Blend by trowel for 10 - 15 seconds only (lumps should be present in mixture). Apply the Dry-Pac by gloved hand, then compress it tightly by using a pneumatic packing tool or a hammer and block.

Step 8
Wet the Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6" (150 mm) strip on either side of slot.

Step 9
Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

SEWAGE CLARIFIER



CONCENTRATE SLURRY COAT | CONCENTRATE DRY-PAC | ADMIX | WATERSTOP

STEP 1: Clean joint thoroughly. Apply Xypex Concentrate slurry to joint surface at the rate of 2.0 lb./sq.yd. (1.0 kg/m^2).

STEP 2: On the inside of the tank, modify the forms to create a linear groove in the finished concrete surface. The linear groove is to be aligned with and included at all construction joints and to be 1" (25 mm) high by 1½" (37 mm) deep.

STEP 3: Pour Xypex Admix treated concrete and cure in accordance with ACI, EN or other applicable international standard. Strip forms including formwork for linear groove.

STEP 4: Clean linear groove thoroughly. Apply Xypex Concentrate slurry to the linear groove at the rate of 1.5 lb./sq.yd. (0.8 kg/m^2). Fill linear groove with Xypex Concentrate Dry-Pac and pack tightly to create the Xypex "sealing strip".

STEP 5: Apply slurry of Xypex Concentrate at 1.5 lb./sq.yd. (0.8 kg/m^2) over sealing strip and extending to 6" (150 mm) on either side. Cure for 48 - 72 hours in accordance with normal Xypex coatings curing procedures.

Note 1: Schematic diagram shows Xypex application and waterstops. Inclusion, type and position of waterstops and expansion joints are at the discretion of the designer. Expanding waterstops may be placed on the slurry coat after it has dried or before application. Slurry coat may only be applied over waterstop if approved by waterstop manufacturer.

Note 2: Keyways may be incorporated into the joint design at the discretion of the designer.

Note 3: Schematic drawing shows Xypex Admix application. Specifier may consider the alternative use of Xypex dry shake (DS-Series) or Xypex coatings, where applicable. Refer to Xypex Standard Specifications for more information.

PATCH'N PLUG

PATCHING & RESURFACING

Concrete Waterproofing

Description

XYPEX PATCH'N PLUG is a specially designed, fast-setting, hydraulic cement compound for concrete patching and repair. Patch'n Plug stops flowing water in seconds and is used to seal cracks, tie holes, and other defects in concrete. The sealing performance characteristics of Patch'n Plug are enhanced by Xypex's unique crystalline waterproofing technology.

Recommended for:

- Stopping an active flow of water through cracks and defects in substrate
- Repair of tie holes, honeycombs and rock pockets
- Repair of leaking construction joints
- Sealing around pipe penetrations

Advantages

- Single component (simply add water)
- Very rapid setting
- Contains Xypex's unique crystalline chemistry for self-healing of cracks and other defects
- Quick return to service of water holding structures
- Cement based – compatible with concrete and masonry substrates
- Non-toxic / no VOCs
- NSF 61 certified

Packaging

Xypex Patch'n Plug is available in 20 lb. (9.1 kg) pails and 60 lb. (27.2 kg) pails.

Storage

Xypex products must be stored dry at a minimum temperature of 45ºF (7ºC). Shelf life is one year when stored under proper conditions.

Coverage

One 60 lb. (27.2 kg) pail of Xypex Patch'n Plug will produce 0.54 cubic feet (0.0154 cu. metres) of mortar.

Test Data

Physical Property	Test Method	Laboratory Test Results	
Setting Time	ASTM C266	min:sec	
Initial Set Final Set		1:30 to 4:00 4:30 to 9:00	
Compressive Strength	ASTM C109	psi	MPa
@ 24 hours @ 28 days		1740 3630	12 25
Tensile Bond Pull-Off	CSA A23.2-6B	psi	MPa
		120	0.8

Note: Samples prepared with 1 part water to 3.25 part dry powder by volume. Results may vary significantly based on environmental, project and other conditions.

Plugging Instructions

1. PREPARATION Chip out crack or other defects to a depth of 1.5 inches (37 mm) and a width of 1 inch (25 mm). The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage; a "V" shaped slot is not acceptable. Do not cut rebar when creating slot. Flush away all loose materials and dirt from the cavity with water and a stiff brush.

2. MIXING Add 1 part water to 3.25 - 3.5 parts Patch'n Plug by volume and mix to the consistency of a stiff putty. Do not mix more than can be used in 3 minutes. For best results, water temperature should be approximately 60ºF - 70ºF (15ºC - 20ºC).

3. PLUGGING Form plug with gloved hand. Place plug into cavity pressing firmly until plug is hard. When sealing cracks, begin at the point of lowest water flow and work towards the point with greatest water flow.

NOTE: Where there is a high volume of water flow due to extreme hydrostatic pressure, a bleeder hose may be necessary to relieve the water pressure while sealing the repair area. (See procedures on the next page).

a. With a hammer drill or chipping gun, if it is possible, without damaging the rebar, deepen the slot an additional 1 inch (25 mm) at the point of greatest water flow.

b. Place a stiff section of hose or pipe into the cavity and secure in place with Patch'n Plug to force water through the hose. Stop the water flow in the remainder of the slot per the directions above (i.e. form plug with gloved hand and press plug firmly into the cavity until it is hard.) This relieves the pressure so that the area can be patched. Allow a minimum of 24 hours for hardening.

c. Remove bleeder hose and plug remaining hole. If necessary, reduce water flow by inserting steel wool or wooden plug in the remaining hole before patching.

Patching Instructions

1. SURFACE PREPARATION Chip out faulty concrete until sound substrate is reached. Remove all loose materials from area and saturate with clean water. Allow water to be absorbed into the concrete, then remove excess water.

2. MIXING For fast repairs to concrete or masonry, add water to Patch'n Plug powder (1 part water to 3 - 3.5 parts powder by volume). Mix to a workable mortar consistency and trowel on as required. For large repairs, we recommend utilizing Xypex Megamix II. Alternatively, mix 2 parts Patch'n Plug powder with 1 part mason sand or small aggregate (3/8 in. or 10 mm minus crushed stone); utilize a similar water / powder ratio as above to create a workable mortar.

Abnormal Temperatures

During above normal ambient temperatures, mixing water should not exceed 90ºF (32ºC) and Xypex Patch'n Plug material should not exceed 70ºF (21ºC). Below normal ambient temperatures will retard the setting time of Patch'n Plug. In this situation, Xypex materials should be stored at normal temperatures (see Storage). Temperature of mixing water can be moderated to either increase or decrease the set time. Do not use Patch'n Plug where the substrate's temperature is below 40ºF (4ºC). Contact the Technical Services Department of Xypex for your particular application.

Technical Services

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex Technical Services Representative.

Certification

Xypex Patch'n Plug is certified as a R2 non-structural repair mortar according to EN 1504-3. The certification of the product and regular audits of FPC are carried out by Notified Body 1020 TZUS (060-051352).

Safe Handling Information

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex pails and packaging. The Manufacturer also maintains comprehensive and up-to-date Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex Technical Services Representative to obtain copies of Safety Data Sheets prior to product storage or use.

Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

CE

XYPEX®
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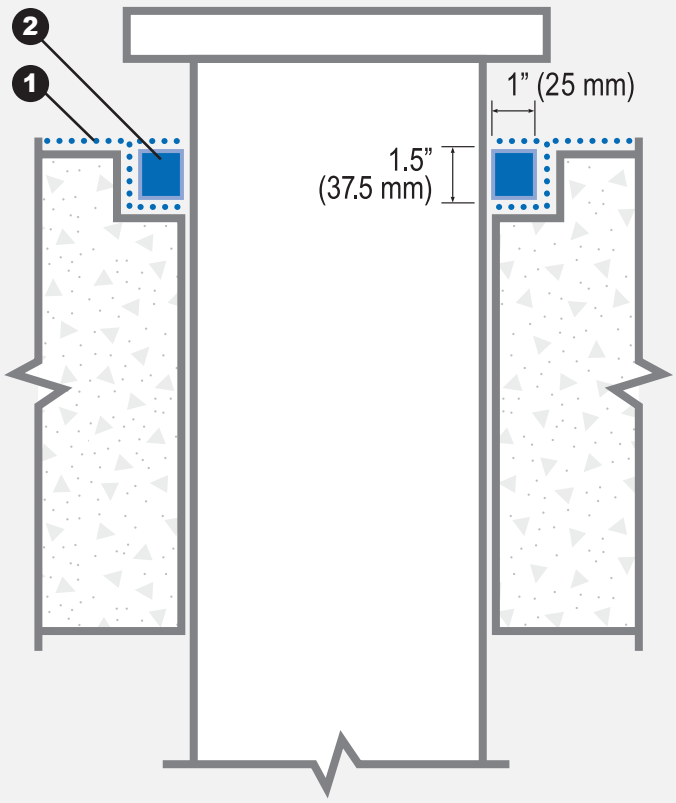
ISO 9001:2008
FM 63167

STANDARD METAL PIPE DETAIL



CONCENTRATE SLURRY COAT CONCENTRATE DRY-PAC

Step 1 Apply Xypex Concentrate slurry to the groove at the rate of 1.5 lb./sq. yd. (0.8 kg/m^2).

Step 2 Fill groove to surface with Xypex Concentrate in Dry-Pac form and pack tightly. Brush Dry-Pac liberally with water and apply a Xypex Concentrate slurry over the Dry-Pac at the rate of 1.5 lb./sq. yd. (0.8 kg/m^2).

Note 1: Schematic diagram shows Xypex application details only and does not depict standard requirements for waterstops or expansion joint sealants.

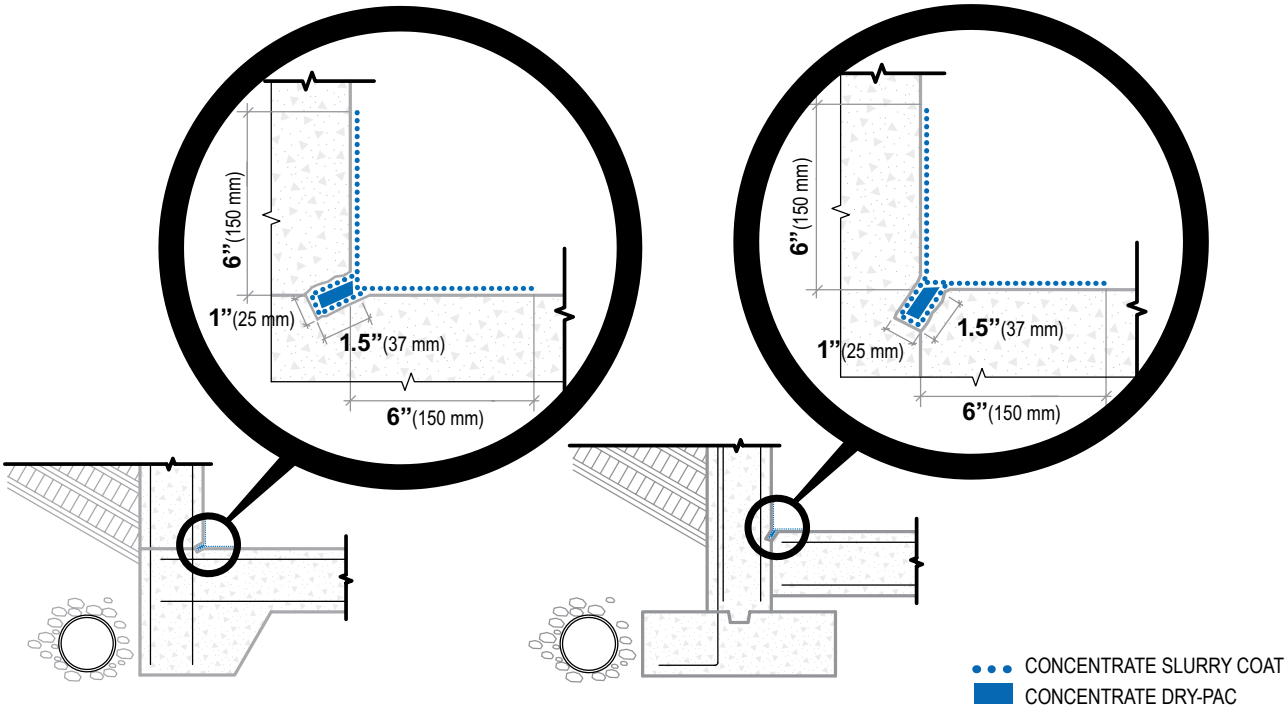
Note 2: Schematic drawing shows Xypex Coating application. Specifier may consider the alternative use of Xypex Dry Shake (DS-Series) or Xypex Additive (Admix C-Series), where applicable. Refer to Standard Specifications for more information.

XYPEX® Method Statement

2016-01

REPAIR OF SLAB INTERFACE JOINTS

No Water Flow



Step 1 – Chip out a "U" shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the construction joint. The slot is to be 1" (25 mm) wide by at least 1.5" (37 mm) deep. A "V" shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage.

Step 2 – Remove all loose materials within the slot and to 6" (150 mm) on either side of slot. Clean, profile (ICRI CSP-3) and saturate this area with water. Allow water to soak into concrete and then remove all surface water.

Step 3 – Apply one slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd.[2] (0.8 kg/m^2) in the slot and to 6" (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

Step 4 – While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

Step 5 – Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6" (150 mm) up the wall and onto the slab away from the slot.

Step 6 – Cure by keeping moist using Gamma Cure and/or by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines.

Note

When early exposure to water is required:

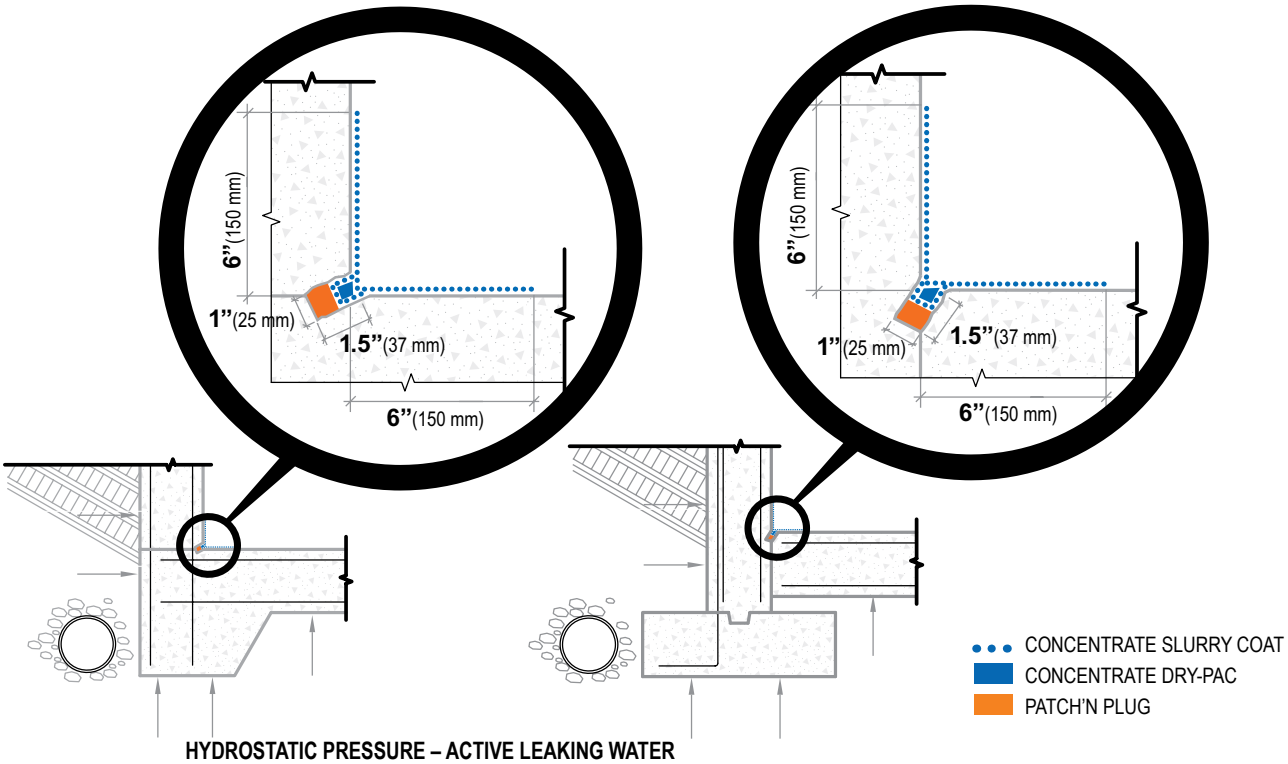
1. In Step 4 – replace the top ¼" - ½" (6 - 12 mm) of Xypex Concentrate Dry-Pac with Xypex Patch'n Plug.
2. Step 5 and Step 6 – eliminate.

XYPEX® Method Statement

2016-01

REPAIR OF SLAB INTERFACE JOINTS

Against a Flow of Water



HYDROSTATIC PRESSURE – ACTIVE LEAKING WATER

Step 1 – Chip out a "U" shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the construction joint. The slot is to be 1" (25 mm) wide by at least 1.5" (37 mm) deep. A "V" shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage. Areas with most water flow should be identified and chipped deeper.

Step 2 – Remove all loose materials within the slot and to 6" (150 mm) on either side of slot. Clean, profile (ICRI CSP-3) and saturate this area with water. Allow water to soak into concrete and then remove all surface water.

Step 3 – To stop active water flow apply Xypex Patch'n Plug to half the depth of slot immediately after removing surface water. Patch'n Plug is mixed by adding one part clean water to 3.5 parts Patch'n Plug powder by volume. Patch'n Plug should be applied to full length of crack/joint area.

Step 4 – Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) in the slot, over the Patch'n Plug, and to 6" (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

Step 5 – While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

Step 6 – Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6" (150 mm) up the wall and onto the slab away from the slot.

Step 7 – Cure by keeping moist using Gamma Cure and/or by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines.

Note

When early exposure to water is required:

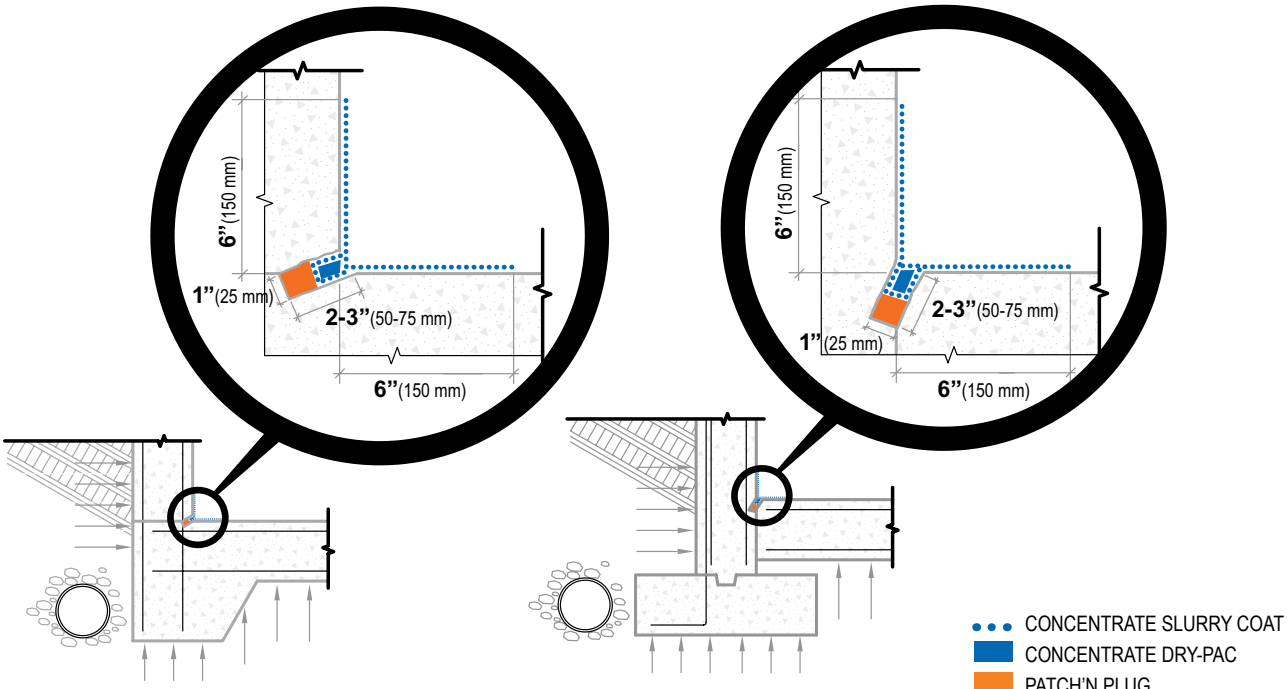
1. In Step 5 – replace the top ¼" - ½" (6 - 12 mm) of Xypex Concentrate Dry-Pac with Xypex Patch'n Plug.
2. Step 6 and Step 7 – eliminate.

XYPEX® Method Statement

2016-01

REPAIR OF SLAB INTERFACE JOINTS

Against High Pressure Water Flow



HIGH HYDROSTATIC PRESSURE – ACTIVE LEAKING WATER

Step 1 – Chip out a "U" shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the construction joint. The slot is to be 1" (25 mm) wide by at least 2" - 3" (50 - 75 mm) deep. A "V" shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage.

Step 2 – In area of greatest water flow, drill hole or cavity 0.5" (13 mm) deeper into slot and over the joint to accommodate a bleeder hose. A bleeder hose is a minimum 1.5 foot (0.5 m) length of smooth surfaced, fairly rigid tubing. Its purpose is to relieve the water pressure while crack/joint is being repaired.

Step 3 – Remove all loose materials within the slot and to 6" (150 mm) on either side of slot. Clean, profile (ICRI CSP-3) and saturate this area with water. Allow water to soak into concrete and then remove all surface water.

Step 4 – Place one end of bleeder hose into the hole or cavity and, while holding hose steady, apply Xypex Patch'n Plug to the slot around the hose. Approximately two to four applications of Patch'n Plug may be necessary to secure the hose in place and embed the tubing completely up to surface level.

Step 5 – To stop active water flow apply Xypex Patch'n Plug to half the depth of remaining slot area. Patch'n Plug is mixed by adding one part clean water to 3.5 parts Patch'n Plug powder by volume. If slot has dried out before Patch'n Plug application, it should be re-wetted. Remove bleeder hose and pack hole with Xypex Patch'n Plug to stop all active water flow.

Step 6 – Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) in the slot, over the Patch'n Plug, and to 6" (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

Step 7 – While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

Step 8 – Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m^2) over the repaired area and to 6" (150 mm) up the wall and onto the slab away from the slot.

Step 9 – Cure by keeping moist using Gamma Cure and/or by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines.

Note

When early exposure to water is required:

1. In Step 7 – replace the top ¼" - ½" (6 - 12 mm) of Xypex Concentrate Dry-Pac with Xypex Patch'n Plug.
2. Step 8 and Step 9 – eliminate.

EXHIBIT D

SANITAIRE AERATION GRID SPECIFICATIONS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Lakes, CA

FLYGT

SANITAIRE®

xylem
Let's Solve Water

Aeration Products

FOR ENERGY-EFFICIENT BIOLOGICAL TREATMENT

Greater energy savings are in the air

Stricter environmental regulations and rising energy costs are forcing wastewater treatment plants to ensure wastewater discharge compliance and at the same time make operations more energy efficient. One of the main areas for environmental and cost savings lies just below the surface of your biological tanks.

Uncover submerged energy savings

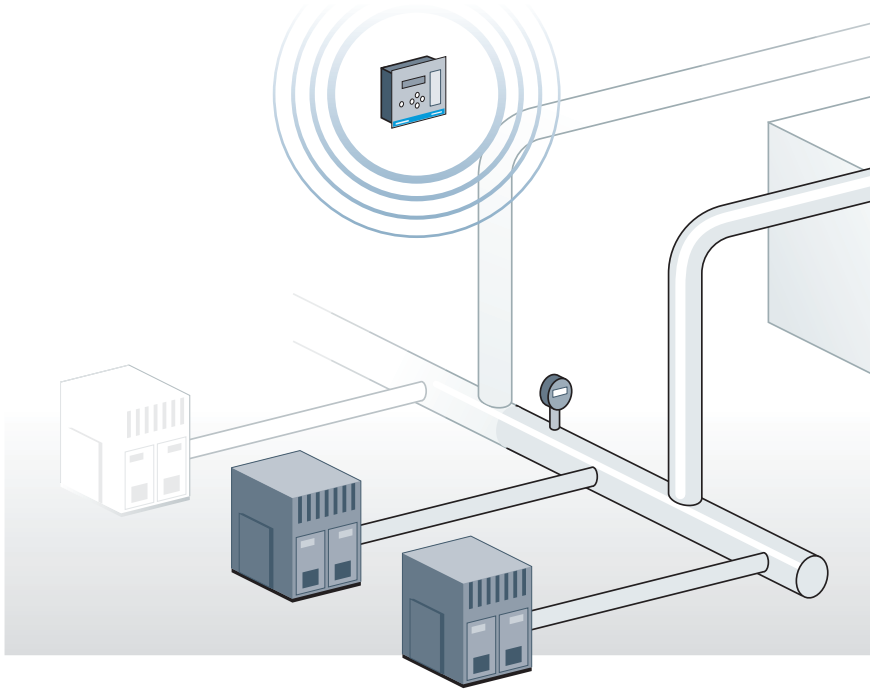
Aeration systems today represent an estimated 30 to 70 percent of the total energy costs at a typical wastewater treatment plant. By making your plant's biological treatment processes more efficient, you can realize big energy savings and lower your operating costs.

Reliable cost-effective aeration solutions

Proven reliable for more than 40 years, comprehensive aeration solutions from Sanitaire and Flygt meet virtually every need and operating condition. From fine-bubble diffusers complete with framework, piping, supports and energy-saving blowers to coarse-bubble diffusers and stand-alone mechanical aerators, our aeration systems reduce both your capital expenditures and operating and maintenance costs. Plus they are backed by precise monitoring and control systems.

Optimizing your aeration processes

Although we offer the best aeration equipment, equipment isn't everything. Competence is. Our engineers put more than four decades of expertise and a true passion for high oxygen transfer to work to ensure environmentally sound operations at your plant. So everything you need to know about improving your aeration processes is available through a single and reliable partner.



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· Sanitaire Gold Series diffusers	5
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· Sanitaire ceramic diffusers	7
· Sanitaire diffuser holders	8
· Sanitaire grid components	9
· Sanitaire coarse bubble wide-band diffusers	10
· Blowers	11
Mechanical aeration	**12-13**
· Flygt jet aerators	12
Monitoring and control	**14**
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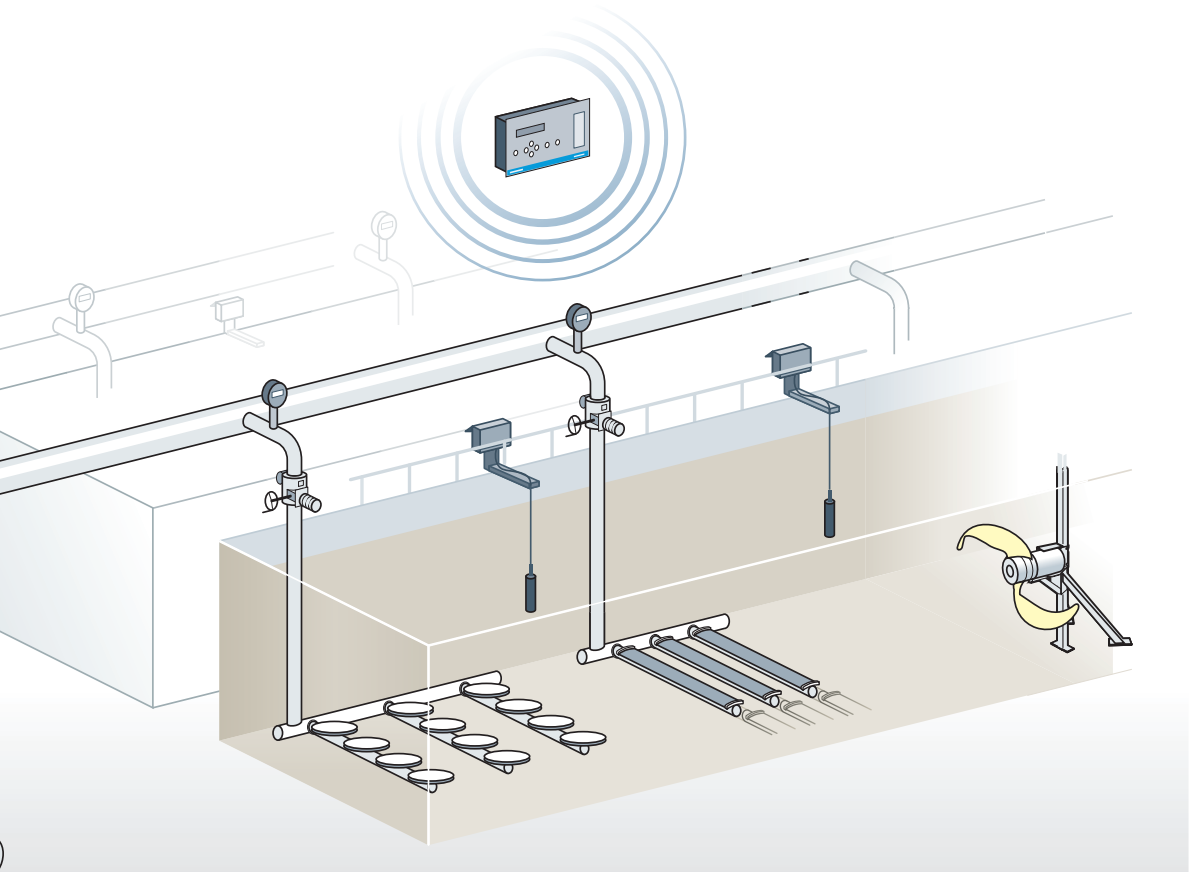


To optimize your process, we design, deliver, commission and, through control systems, support the operation and maintenance of your aeration system – from blowers to diffusers.

We understand how different operating strategies and equipment selection affect energy consumption and costs. So we can determine where additional operational efficiencies can be realized. Introducing an automated monitoring and control system or combining diffusers with mixers, for instance, can drastically boost efficiency and energy savings.

Whatever the challenge, be sure to take advantage of our vast aeration engineering expertise. This not only will improve aeration efficiency at your plant, but enable you to focus on increasing the profitability of your core business.

More oxygen delivered per kilowatt hour

Factors to consider when designing your aeration system:

Standard oxygen transfer efficiency (SOTE)

Used to compare oxygen transfer efficiency, SOTE is the ratio between the amount of oxygen transferred and the amount actually delivered. Per-formance can reach up to 60% depending on the water depth and airflow rate.

Standard aeration efficiency (SAE)

SAE is the ratio between the amount of oxygen transferred to the water and the amount of energy used. Typical values are 1–2 kg O_2/kWh for mechanical aeration systems and 2–8 kg O_2/kWh for diffused aeration systems.

SAE reflects both SOTE as well as blower efficiency and the system pressure loss.

Which aerator is right for you?

Treatment stages	Applications	Diffused aeration	Mechanical aeration
Preliminary and primary	Grit chamber	Coarse bubble	
	Retention basin	Coarse bubble/Fine bubble	Jet aerator
Secondary	Biological aeration	Fine bubble	Jet aerator
Tertiary	Aeration before discharge	Fine bubble	
Sludge	Aerobic digestion		Jet aerator
	Sludge holding	Coarse bubble/Fine bubble	Jet aerator
	Odor control	Fine bubble	Jet aerator

Dissolving into thin air

For reliable oxygen transfer in all types of wastewater aeration applications, choose Sanitaire® diffused aeration systems. No matter the tank geometry or process application, Sanitaire systems have proven effective in thousands of communities and industries worldwide.

Customize your system
Select the right components from the Sanitaire range and combine them with an air piping system, required support and an energy-efficient blower.

Fine-bubble diffusers
Sanitaire fine-bubble diffusers are generally employed for biological aeration, pre-discharge aeration and sludge holding odor control. Choose between Sanitaire Gold Series for high efficiency, Sanitaire Silver Series II membrane diffusers for standard and low-pressure aeration applications and the durable Sanitaire ceramic diffusers for applications that require corrosion resistance.

Coarse-bubble diffusers
For tougher applications such as sludge or industrial wastewater, Sanitaire coarse-bubble diffusers are the preferred technology. Typically used in grit chambers, retention tanks and sludge holding tanks, the Sanitaire wide-band diffuser doesn't disappoint.

Grid components

To support Sanitaire fine bubble diffused aeration systems, we offer standardized grid components.

See page 9.

Air supply

No aeration system would be complete without an air supply and distribution system. Using in-house tools, we optimize designs for temperature and pressure considerations. We also complement Sanitaire aeration system with dependable blowers.

See page 11.

Sanitaire Gold Series diffusers

Sanitaire Gold Series membrane diffusers are the latest innovation in fine-bubble aeration technology. Wherever high-density coverage and low flux rates are required, these can be tightly packed across any given basin floor area to provide unsurpassed aeration efficiency.

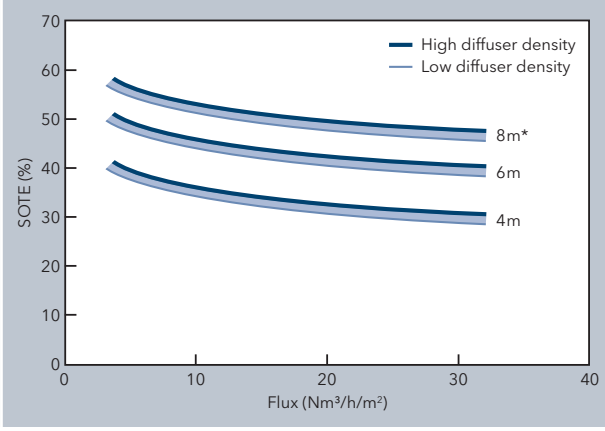
Energy efficiency
The unique diffuser geometry, and advanced micro-punched membrane enable high-density basin floor coverage and low air flux, which together provide high oxygen transfer using the lowest possible amount of energy. The membrane is engineered for low head loss thereby reducing energy consumption further.

High reliability
Thick, highly pliable polyurethane membranes outlast others in accelerated aging tests. Dependability is further enhanced by the watertight construction of the end fittings and sealing system, which withstand the stress of daily operation. It has even proven to be adapted to air-on/air-off applications.

Ease of installation
Compactness makes these complete, pre-assembled diffusers easy to install. This translates into faster commissioning, smarter use of resources and, ultimately, higher productivity.

Modularity
Modular design facilitates installation as well as low-cost, no-hassle retrofits because all Sanitaire components are interchangeable to enable optimization of aeration system performance.

Performance curves
Gold Series



**Submergence*

Technical data

Membrane material	Polyurethane
Lengths	2,286 mm (90 in) 1,500 mm (59 in) 700 mm (28 in)
Airflux range	3.7–37 $Nm^3/h/m^2$ 0.2–2 $scfm/ft^2$
Standard oxygen transfer efficiency (SOTE)	7–10% per m submergence 2.2–3% per ft
Standard aeration efficiency (SAE)	3–8 kg O_2 /kWh 8–15 lbs O_2 /hph

Sanitaire Silver Series II diffusers

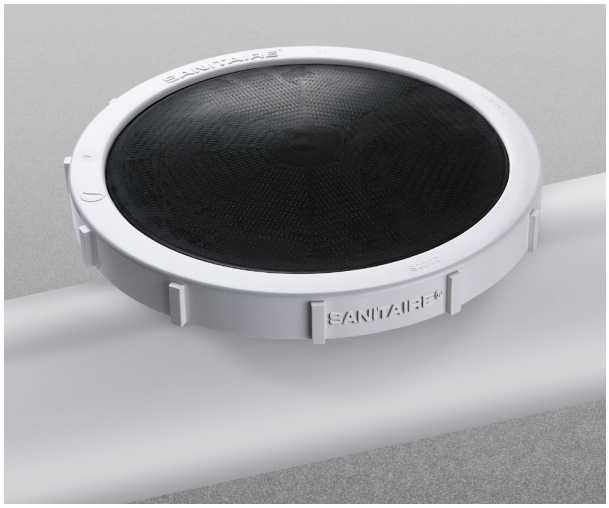
For a combination of high aeration efficiency and low operating costs, there's the Sanitaire Silver Series II membrane diffuser – the most widely used fine bubble diffused aeration system available today.

High oxygen transfer efficiency
The Sanitaire Silver Series II membrane features a unique slit pattern and slit shapes, which disperse air bubbles in an extremely fine, uniform pattern for optimal oxygen transfer.

Long service life, low maintenance
The high elasticity and degradation-resistance of specially blended high-grade EPDM elastomer compounds contribute to a service life of 10 or more years.

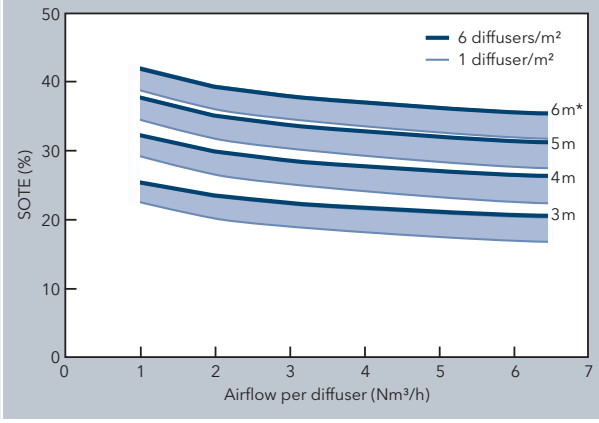
Operating efficiency
The unique membrane shape, integrated O-ring and top-sealing threaded retainer ring eliminates leakage. This reduces energy consumption and raises operating efficiencies.

Great application flexibility
A highly effective, integrated check valve enables the aeration zones to easily be shut down for air-on/air-off applications.



Sanitaire Silver Series II LP
This 9" low-pressure version of the Sanitaire Silver Series II membrane features a modified slit pattern to handle airflow up to 17Nm³/h (11 scfm) with minimal pressure loss. It is an excellent choice for sludge and other heavy-duty applications.

Performance curves
Silver Series II



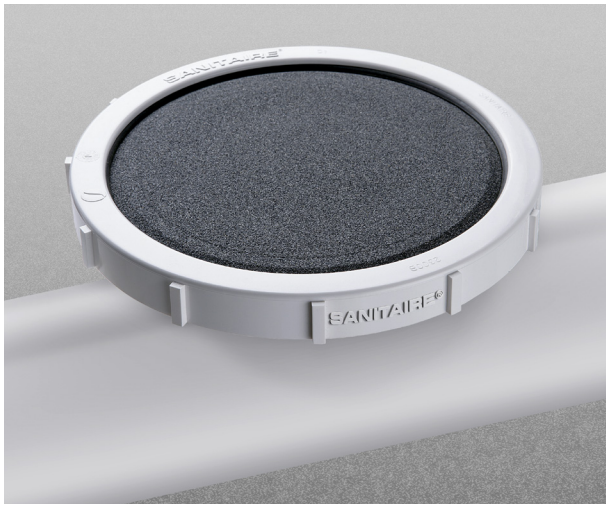
**Submergence*

Technical data

Disc material	Specially blended high-grade EPDM
Diameter	178 or 229 mm (7 or 9 in)
Airflow range per disc	0.8–7 Nm³/h (0.5–4.5 scfm)
Standard oxygen transfer efficiency (SOTE)	Approx. 6.5% per m submergence (2% per ft)
Standard aeration efficiency (SAE)	2.5–6 kg O_2 /kWh (4–10 lb O_2 /hph)

Sanitaire ceramic diffusers

Sanitaire ceramic diffusers handle aeration of aggressive, highly corrosive wastewater, delivering high oxygen transfer both efficiently and cost effectively.



Low total cost of ownership

Sanitaire ceramic discs are specially compression-molded to achieve optimal contours for high oxygen transfer efficiency at low operating pressures. Variable areas of density across the disc surface promote uniform airflow distribution. This contributes to low system head loss, low energy consumption, low operating costs and, thereby, a low total cost of ownership.

Energy efficiency

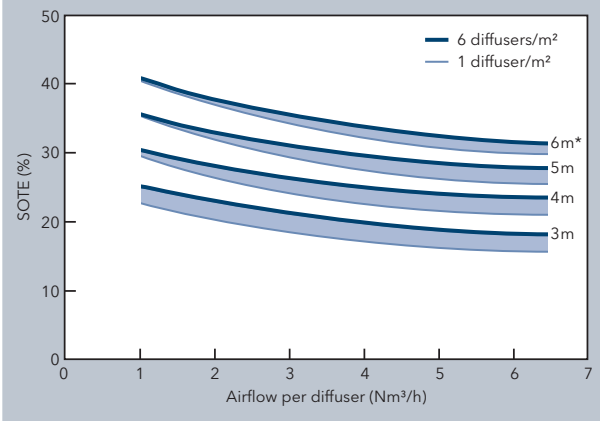
Sanitaire ceramic discs feature a top-sealing threaded retainer ring, which ensures an airtight seal. As air pressure increases, the sealing force on the O-ring increases thus creating an airtight seal. Because there are no air leaks, no energy is wasted.

20-year-long life expectancy

Durable, reliable and clog-resistant, Sanitaire ceramic discs are low-maintenance diffuser elements that typically last 20 or more years. To prolong service life further, an optional in-place gas cleaning system enhances continuous performance.

Performance curves

9" ceramic



*Submergence

Technical data

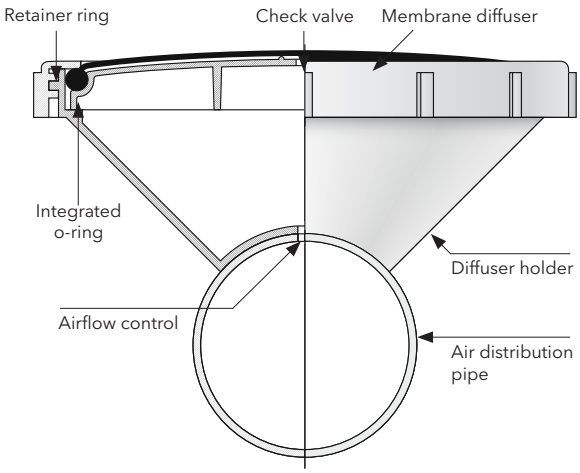
Disc material	Special compression-molded ceramic
Diameter	178 or 229 mm (7 or 9 in)
Airflow range per disc	0.5–4.7 Nm³/h (0.3–3 scfm)
Standard oxygen transfer efficiency (SOTE)	Approx. 6.5% per m submergence (2% per ft)
Standard aeration efficiency (SAE)	2.5–6 kg O_2 /kWh (4–10 lb O_2 /hph)

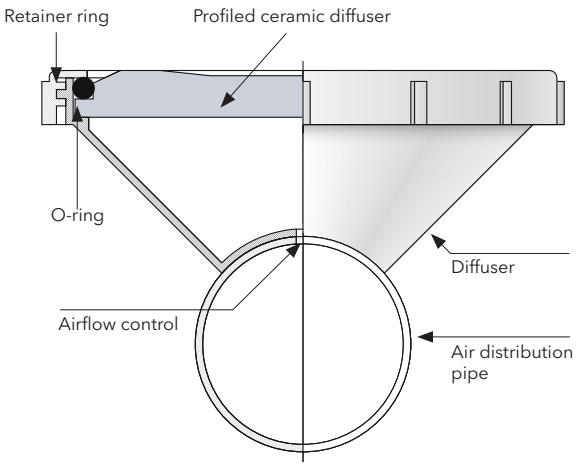
Sanitaire diffuser holders

These easy-to-install Sanitaire diffuser holders provide superior mechanical strength to support Sanitaire Gold Series and Silver Series II membranes and Sanitaire ceramic discs.

Sanitaire 2300 holder

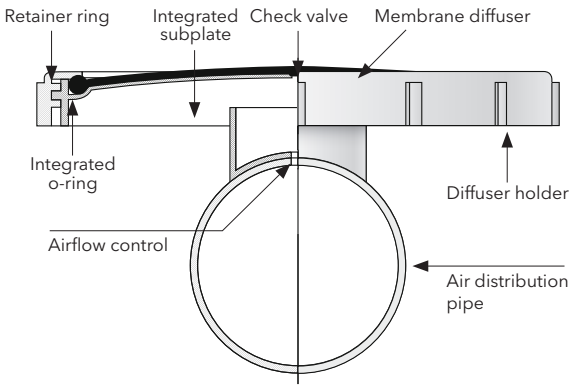
Designed for use with Sanitaire Silver Series II membranes, Sanitaire Silver Series II LP membranes and Sanitaire ceramic discs.





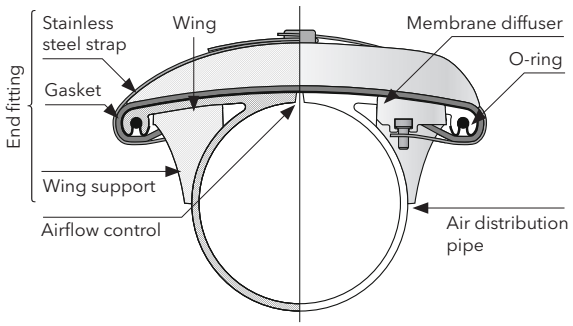
Sanitaire 2802 holder

A cost-effective alternative, the Sanitaire 2802 is designed for use with the Sanitaire Silver Series II and Silver Series II LP membranes.



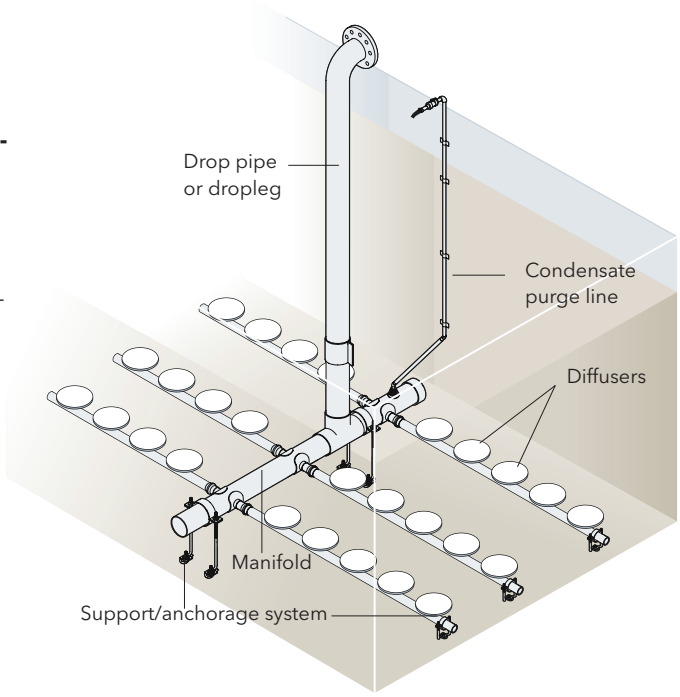
Sanitaire Gold Series holder

Designed for use with Sanitaire polyurethane membranes and based on the highly efficient cross-section of the 7" holder.



Sanitaire grid components

Beneath every Sanitaire diffused aeration system is a solid foundation. These components are integral to the Sanitaire fine bubble range and hold important supporting roles.



Solid framework
Patented Sanitaire spline joints ensure firm connection of air supply pipes from the dropleg to the diffusers. Engineered to withstand thermal expansion and contraction, water hammer and other dynamic stress, these spline joints securely fasten the pipes, thereby preventing air leakage, pipe blowapart and pipe rollover.

Upstanding system support
Made of durable corrosion-resistant stainless steel, Sanitaire guide supports securely anchor Sanitaire diffused aeration systems. These robust threaded supports feature an infinite height adjustment mechanism to ensure accurate grid leveling. The pipe bracing assembly accommodates pipe expansion while providing a stable foundation. Specially reinforced Sanitaire guide supports are available for high velocity and mixer zones.

Easy to adapt
Sanitaire air distribution pipes are delivered with factory-welded diffuser holders and Sanitaire Gold Series are delivered as pre-assembled units, to facilitate installation. Moreover, Sanitaire grid components are fully interchangeable with your existing system. To meet more stringent emissions requirements, for example, it's easy to replace Sanitaire ceramic discs with Sanitaire Gold Series or Silver Series II membranes.

Aeration purging
After condensation, water levels in the manifold can rise and extend to the headers. To deal with water buildup, we offer a separate purge system that removes condensate from the lowest point in the system.

Spline joints

Adjustable grid support

Technical data	
Dropleg	Stainless steel AISI 304 or 316
Manifolds	Stainless steel, specially formulated polyvinyl chloride (PVC) to prevent UV degradation.
Distribution headers	PVC or CPVC for higher temperatures
Supports and anchor bolts	Stainless steel AISI 304 or 316
Gaskets	EPDM

Sanitaire coarse bubble wide-band diffuser

The Sanitaire stainless steel wide-band diffuser is an excellent choice and a smart alternative to mechanical aeration. It is especially suited to tough sludge-related applications such as aerobic sludge digestion, grit chambers, flow equalization and channel aeration.

Clog-resistant, maintenance-free design
The Sanitaire wide-band diffuser features an innovative inverted air reservoir. This stores a sufficient air volume at the centre of the diffuser for use to ensure continuous and uniform airflow. This prevents clogging. Another smart feature is a bottom deflector, which prevents the entry of debris into the diffuser and reduces the need for maintenance.

Erosion/corrosion resistance
Thanks to immersion passivation after fabrication, the Sanitaire wide-band diffuser is erosion/corrosion-resistant and maintains full structural integrity even in welded heat-affected zones. This prolongs service life.

Solid oxygen transfer efficiency
Dual horizontal levels of diffusion ports on the diffuser side ensure uniform air distribution and aeration efficiency.

Technical data	
Material	Stainless steel AISI 304 or 316
Length	305 or 610 mm (12 or 24 in)
Airflow range per band	15–63 Nm^3/h (10–40 scfm)
Standard oxygen transfer efficiency (SOTE)	1.6–2.5% per m submergence (0.5–0.8% per ft)
Standard aeration efficiency (SAE)	0.7–2 kg O_2 /kWh (1.1–3.5 lbs O_2 /hph)

Blowers

Optimizing your aeration systems is of paramount importance. Which is why we can complement every Sanitaire diffused aeration system with a fully packaged blower system that is reliable, energy-efficient and easy to maintain.

It takes experience and expertise to select the right blower for your aeration system. We have both. We understand the parameters that influence blower selection – from energy efficiency and reliability to life cycle cost, operational flexibility and installation footprint through to noise levels and maintenance requirements.

Whatever your aeration needs, we help you select the right blower from among these technologies, which are typically found in a wastewater treatment plant.

Rotary lobe blowers
A pair of spinning rotors delivers a fixed volume of air for each rotation. Rotary lobe blowers rely upon external compression whereby the air is compressed by the system backpressure. While these offer the advantage of low capital investment costs upfront, they also provide low efficiency.

Screw rotor blowers
A pair of intermeshing screws progressively reduces the volume of air as it moves along the length of the screw element. These provide higher efficiency than other positive displacement blowers due to the use of internal compression.

Multi-stage centrifugal blowers
Multiple impellers are mounted on a single low-speed shaft normally operating at a fixed speed. These are employed for larger flows and require less capital investment than other types of centrifugal blowers, however are also generally less efficient.

Single-stage, integrally geared centrifugal blowers
A single impeller achieves higher rotational speed via a step-up gear. These can be equipped with variable inlet guide vanes and diffuser vanes to achieve high efficiency over a range of operating flows. Single-stage, integrally geared blowers are more efficient than positive displacement and multi-stage centrifugal blowers.

Variable-speed, single-stage direct-drive centrifugal blowers
A single or dual impeller is mounted directly on to the shaft of a high-speed motor with low-friction magnetic or air foil bearings. These have integrated VFD (variable frequency drive) to match pressure and flow rate demands. While more expensive than positive displacement and multistage centrifugal blowers, these are more efficient.

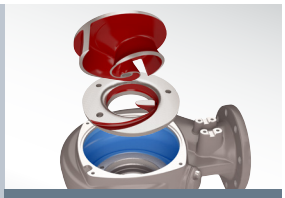
Flygt jet aerators

Mechanical aeration systems from Flygt provide an affordable alternative to our highly efficient diffused aeration systems. Convenient lift-in, lift-out solutions, submersible Flygt jet aerators provide reliable, low-cost oxygen transfer for small to medium-sized sludge tanks, retention tanks and bio-reactors.

Quick, low-cost installation
Convenience doesn't come easier than with Flygt jet aerators. Simply lift and position these stand-alone aeration systems into any small to medium-sized tank without having to empty it, using the Flygt pump lift and chains. Installation is complete. Then plug in Flygt jet aerators and let them work. No blowers, special housing or superstructures are required.

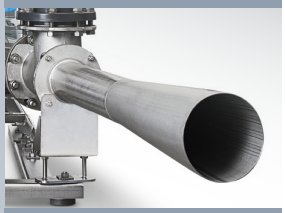
Proven long-term reliability
Flygt jet aerators provide maximum uptime and minimal maintenance. Proven N-technology, a specially engineered Flygt ejector assembly and air suction pipe bend combine to provide high operational reliability.

Better working environment
Because the submersible Flygt jet aerator rests on the tank bottom, there's significantly less spray and lower noise levels and vibrations. This greatly improves the working environment.



Proven N-technology

Flygt jet aerators feature Flygt N-pumps with N-technology, renowned for its non-clogging design and high efficiency.



Ejector assembly

The robust, non-clogging ejector assembly creates high turbulence where wastewater combines with air to form a liquid jet containing fine air bubbles.

Damper feet

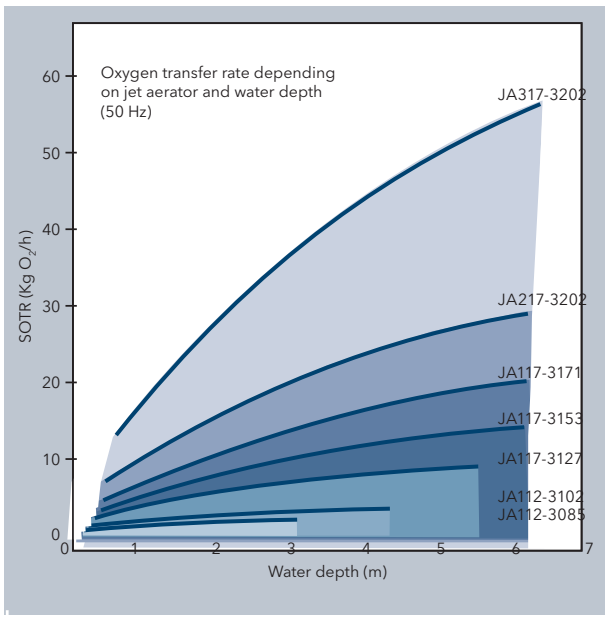
Robust stand with damper feet prevents vibration, which could damage the ejector system.

Operational flexibility
Compact Flygt jet aerators fit into any tank regardless of size or shape. Choose the Flygt pump capacity, number of mechanical ejectors and materials that match your requirements. Pumps can serve between one and three ejectors.

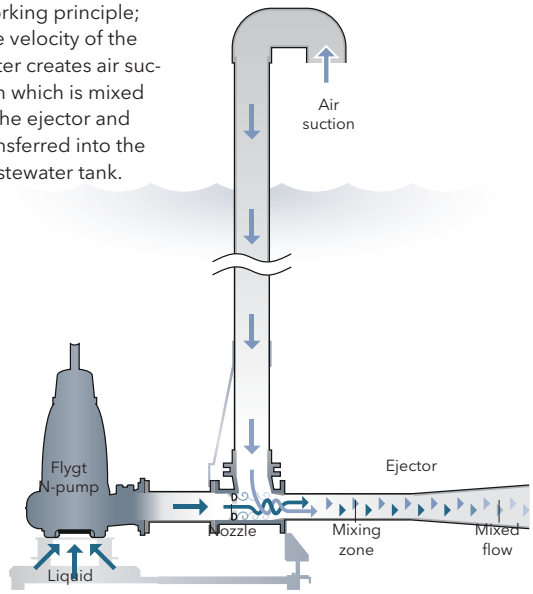
Erosion/corrosion-resistant operation
Greater durability can be achieved by choosing the stainless steel ejector assembly and Hard-Iron™ N-impeller over the standard galvanized steel ejector assembly and cast iron N-impeller.

The Flygt jet aerator consists of air suction pipes, an N-pump, ejector housings and ejectors.

Performance curves



Working principle;
The velocity of the water creates air suction which is mixed in the ejector and transferred into the wastewater tank.



Technical data

Model	JA112	JA112	JA117	JA117	JA117	JA217	JA317
SOTR at 4m (13 ft) depth 50Hz, kgO_2/h 60Hz, kgO_2/h (lbsO_2/h)	 1.5* 2.2 (4.8)	 3.2 3.3 (7.3)	 7.5 7.8 (17)	 11 12 (26)	 15 17 (37)	 22 30 (66)	 40 43 (95)
Ejectors	1	1	1	1	1	2	3
Nozzle outlet diameter (mm)	55	55	95	95	95	95	95
Flygt N-pump	3085 MT	3102 MT	3127 MT	3153 MT	3171 MT	3202 MT	3202 LT
Rated power, kW (hp) 50 Hz 60 Hz	 2 2.2 (3)	 3.1 3.7 (5)	 5.9 7.5 (10)	 9 11.2 (15)	 15 18.6 (25)	 22 34 (45)	 37 45 (60)
Cooling jacket	–	–	–	•	•	•	•
Standard aeration efficiency (SAE)	‹---------- 0.5–1.2 kgO_2/kWh (0.8–2 lbsO_2 /hph) ----------›						

** At 3m (10 ft) depth.*

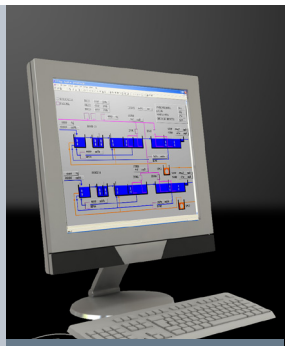
Empowering system performance

Take command of the performance of your aeration systems with our monitoring and control systems. To help you meet your responsibilities in a constantly changing environment, you can rely on us to put you in total control of your entire plant or plant subsystem/s.

Saving energy on a daily basis
The Flygt APX process controller automatically adapts the air supply to your oxygen requirements based on daily and seasonal variations. This drastically reduces power consumption and boosts energy savings by up to 40%. The information in our systems flows seamlessly to most existing third-party control system. So after installation, you can immediately begin saving more energy.

Total control, total performance
For full end-to-end control of your entire plant, combine the Flygt APX process controller with the Flygt AquaView SCADA system. Both are based on open standards, no special interfaces are required to communicate with most programmable logic controllers (PLCs) or SCADA systems. This makes continuous real-time monitoring of individual components possible. It also provides detailed data on events to identify trends and diagnose problems before they even occur. With total control, you can boost energy efficiency every step of the way and raise performance at your plant.

Total peace of mind
We understand that system reliability is of paramount importance. With us as your single reliable partner, you not only can improve control over your operations, but improve productivity and profitability. Managing your plant from any remote location is easy, thanks to web-based tools and online support. What's more, our control systems are flexible, scalable and future-proof and can accommodate additional equipment in virtually any treatment plant configuration.



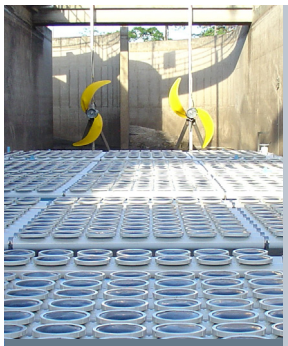
Flygt AquaView SCADA system

- Provides a complete plant overview
- Collects and stores data to identify trends and diagnose problems before they occur
- Provides extensive alarm handling

Flygt APX 700 process controller

- Distributes the required oxygen to tanks and grids
- Operates blowers at optimal efficiency
- Provides extensive alarm handling

Aeration expertise runs deep

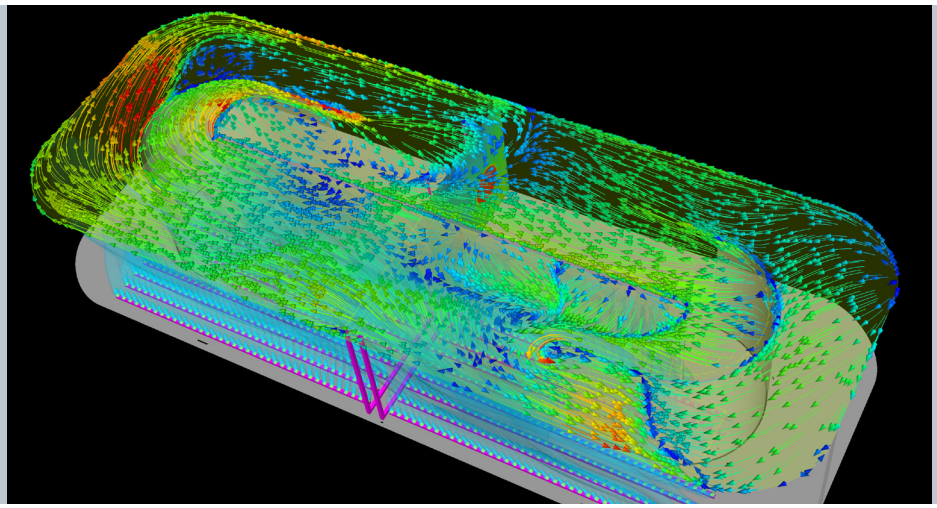


Combining aeration & mixing technologies

To deliver high oxygen transfer and mixing efficiencies with minimal energy consumption, you can rely on our engineers to share their knowledge about system design.

Comprehensive system design services

- System simulation utilizing CFD
- Engineering software development
- Advisory services
- System design assistance
- System specification assistance
- Oxygen transfer testing
- Model testing



We are passionate about the design and execution of comprehensive aeration treatment solutions. We have knowledge and understanding of the aeration process to safeguard the wellbeing of your business and the environment.

Extensive systems engineering
Our competence in systems engineering runs deep. We can assist you every step of the way – from developing mixing and aeration specifications to shop testing. Through thorough aeration design analysis, we are able to achieve the highest possible oxygen transfer while using the least possible amount of energy.

Smart tools to analyze aeration design
Our engineers combine their experience and expertise with specially developed software programs and tools so that we can design new and existing aeration installations tailored to your requirements.

Computational fluid dynamics (CFD) programs enable our engineers to simulate your aeration operating conditions, determine how best to optimize flow turbulence in your tanks and minimize energy consumption.

We use system temperature and pressure calculations to determine the optimal conditional for every single component in your entire aeration system – from blower to grid.

Grid configuration is another area where we excel. We tailor your grid to meet your requirements for oxygen transfer.

Support all along the way
Customers worldwide have come to rely on us for comprehensive range of aeration system components and accessories, spare parts and support. Whatever your requirements, we support you all the way – from designing and commissioning to optimizing and maintaining your aeration systems.

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to **www.xyleminc.com**

FLYGT

460 . Aeration products . 1 . US . 1 . 20151130

xylem
Let's Solve Water

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xylem
Let's Solve Water

Sanitaire® Ceramic Disc Diffusers

EFFECTIVE AERATION FOR CORROSIVE ENVIRONMENTS

Sanitaire ceramic diffusers handle aeration of aggressive, highly corrosive wastewater, delivering high oxygen transfer both efficiently and cost effectively.

Low total cost of ownership

Sanitaire ceramic discs are specially compression-molded to achieve optimal contours for high oxygen transfer efficiency at low operating pressures. Variable areas of density across the disc surface promote uniform airflow distribution. This contributes to low system head loss, low energy consumption, low operating costs and, thereby, a low total cost of ownership.

Energy efficiency

Sanitaire ceramic discs feature a top-sealing threaded retainer ring, which ensures an airtight seal. As air pressure increases, the sealing force on the O-ring increases, thus creating an airtight seal. Because there are no air leaks, no energy is wasted.

20-year life expectancy

Durable, reliable and clog-resistant, Sanitaire ceramic discs are low-maintenance diffuser elements that typically last 20 or more years. To prolong service life further, an optional in-place gas cleaning system enhances continuous performance.

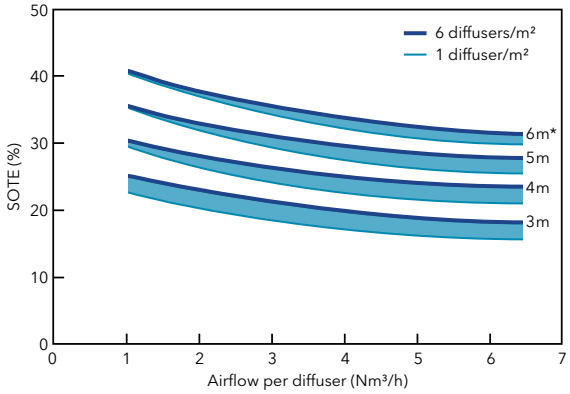
SANITAIRE
a xylem brand

Sanitaire® Ceramic Disc Diffusers

Experience you can trust.

With our unique expertise in biological treatment processes and equipment, Xylem can design state-of-the-art aeration systems that provide energy efficiency and process stability. From developing aeration and mixing specifications to defining a control strategy, we can assist you every step of the way.

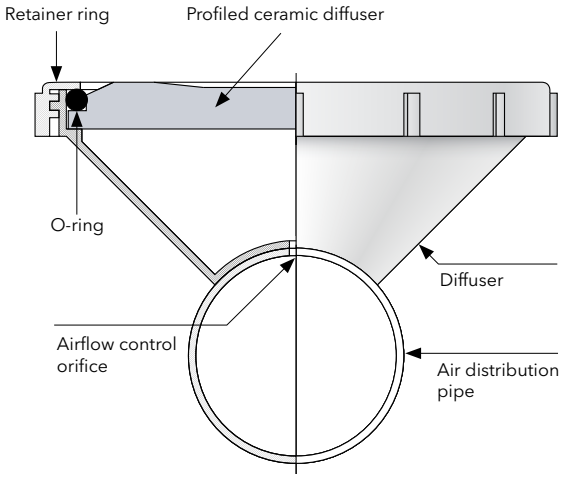
Performance curves



*Submergence

Diffuser holder

The easy-to-install Sanitaire 2300 diffuser holder provides superior mechanical strength to support Sanitaire ceramic discs.



Technical data

Disc material	Proprietary compression-molded ceramic
Diffuser holder material	uPVC or cPVC
Disc diameter	178 or 229 mm (7 or 9 in)
Mounting options	Saddle or screw-on
Effective surface area	
178 mm (7 in)	0.024 m^2 (0.26 ft^2)
229 mm (9 in)	0.038 m^2 (0.41 ft^2)
Orifice size	5 mm ($^{13}/_{64}$ in)
Airflow range per disc	0.8-7 Nm^3/h (0.5-4.5 scfm)**
Standard oxygen transfer efficiency (SOTE)	6-7% per m submergence (2-2.5% per ft)**
Standard aeration efficiency (SAE)	2.5-6 kg O_2 / kWh (4-10 lb O_2 / hph)
Operating mode	Continuous

*** For 229 mm (9 in) diameter*

xylem
Let's Solve Water

www.xylem.com

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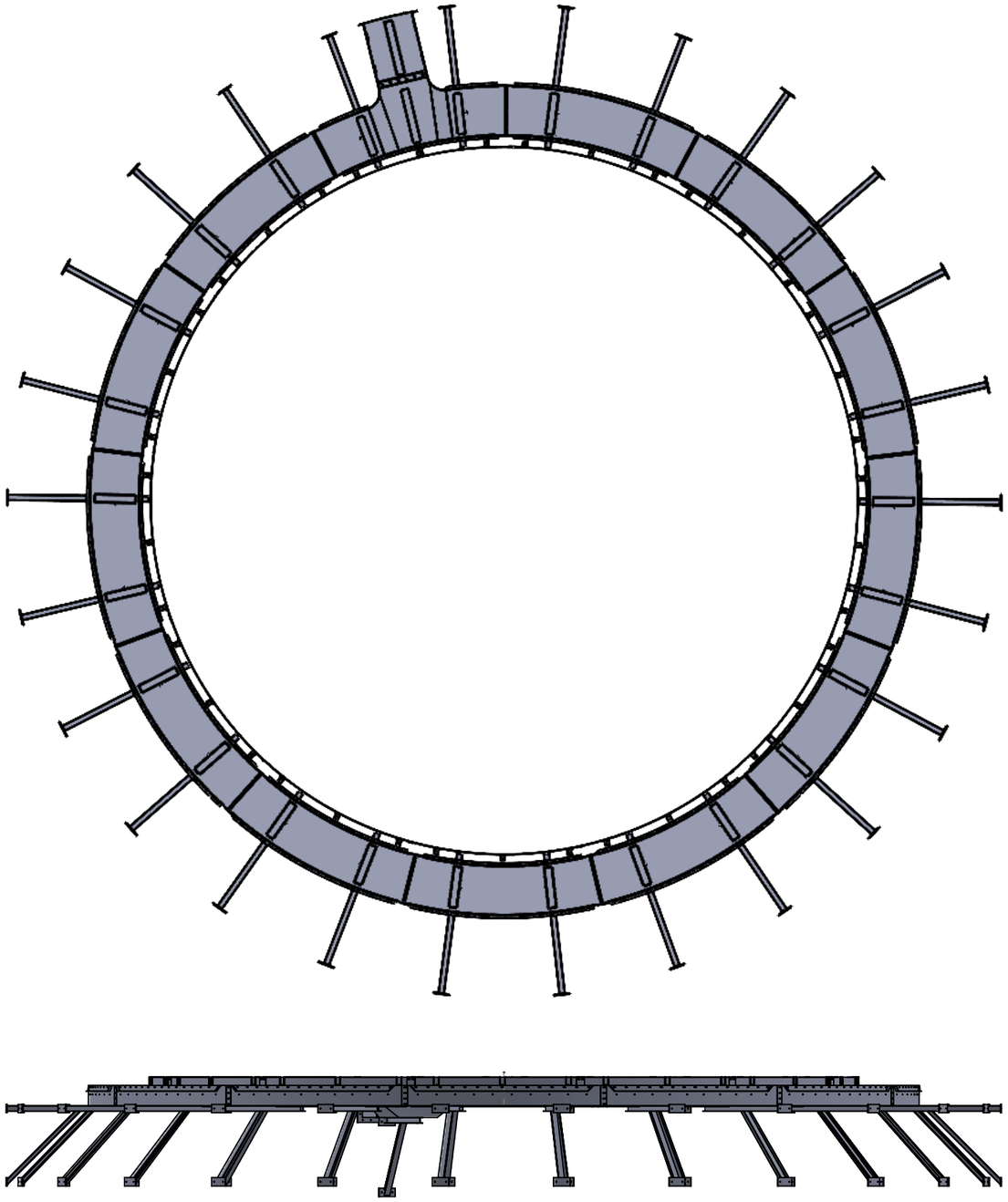
EXHIBIT E

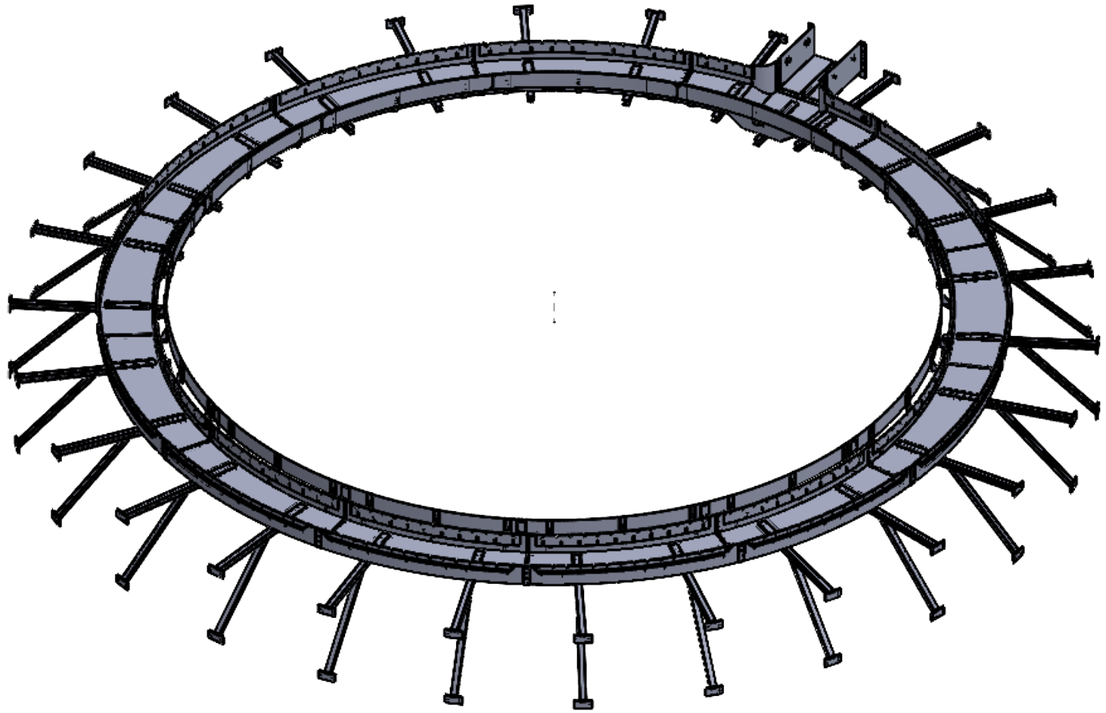
SECONDARY CLARIFIER WEIR TROUGH BILL OF MATERIALS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Lakes, CA





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	CHECKED BY:				2	Added C CHannel	3/19/25
Mammoth, CA	APPROVED BY:	SCALE:NOT TO SCALE	TITLE:	REF:			
	DATE: 3/10/25						

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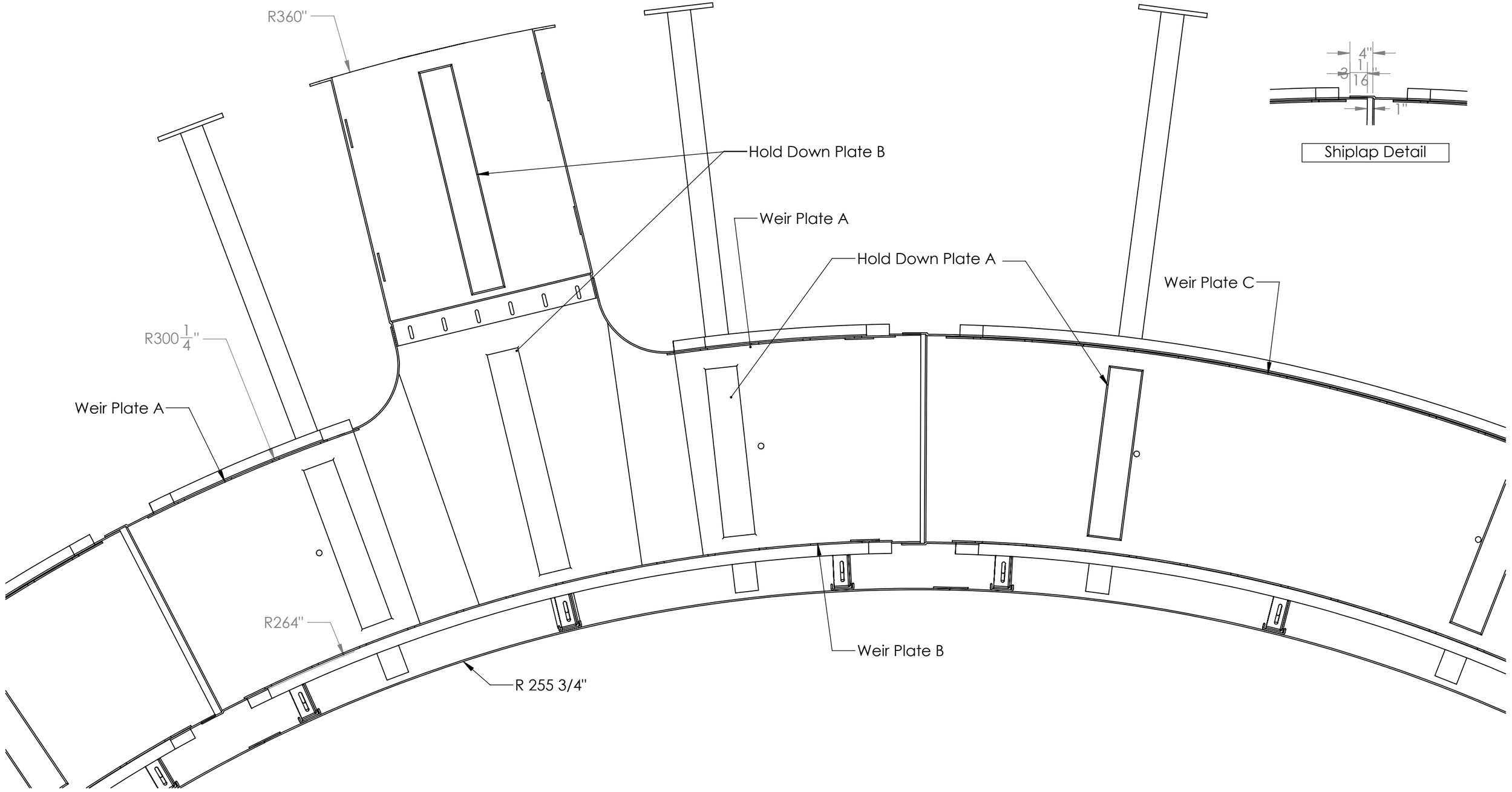

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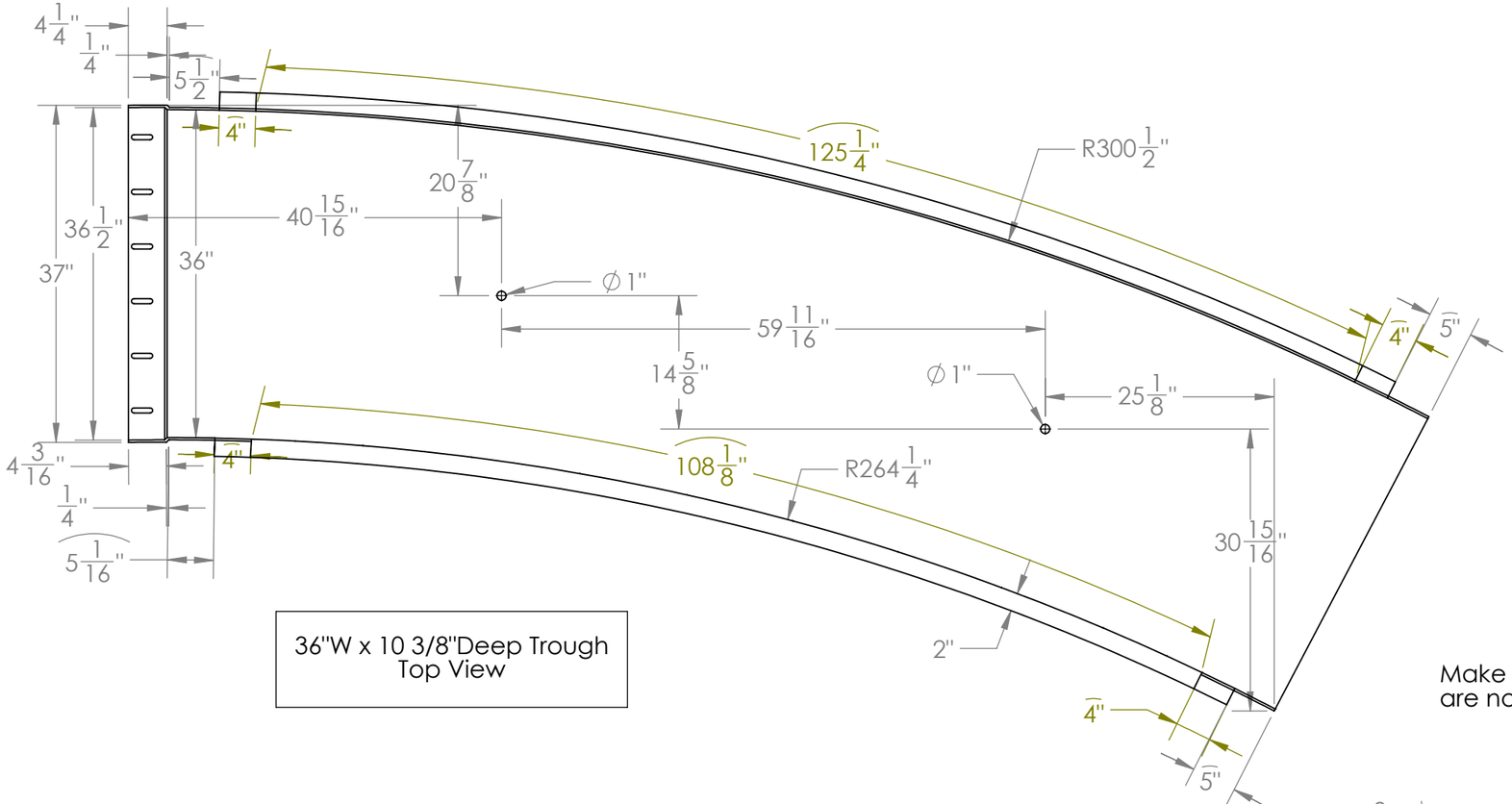
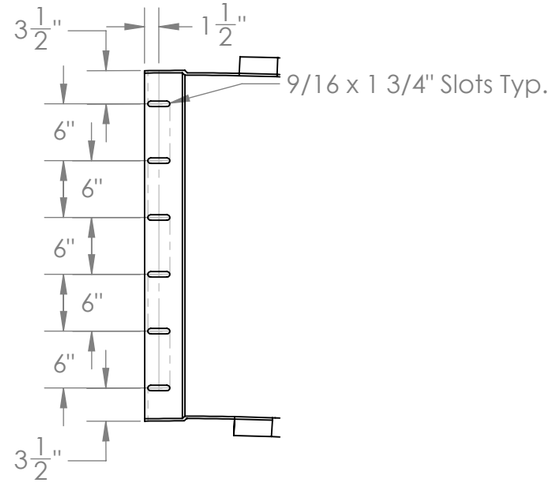
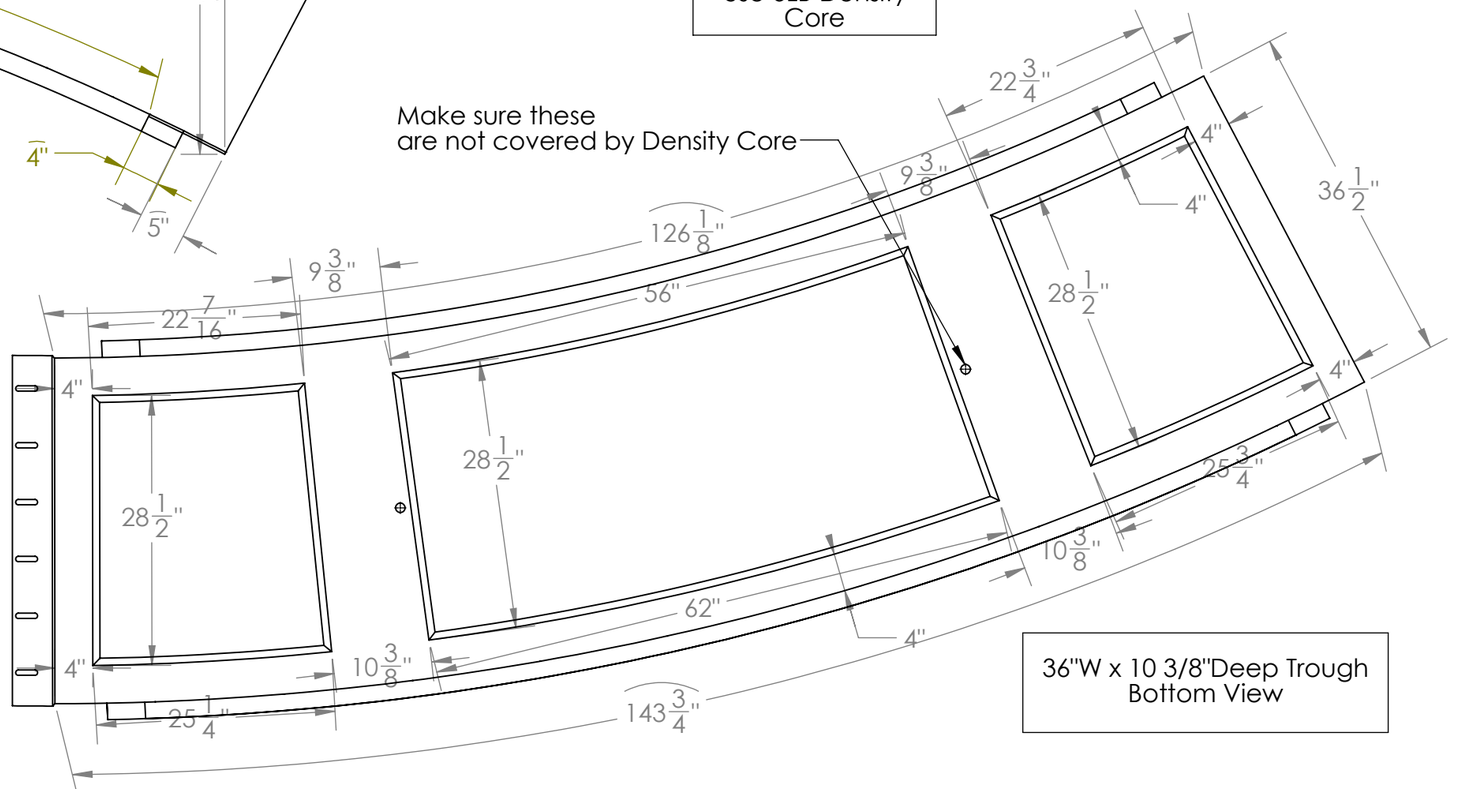


36"W x 10 3/8"Deep Trough
Top View



Use 6LB Density
Core



36"W x 10 3/8"Deep Trough
Bottom View

SHEET NO.3	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS		NO.	REVISIONS	DATE
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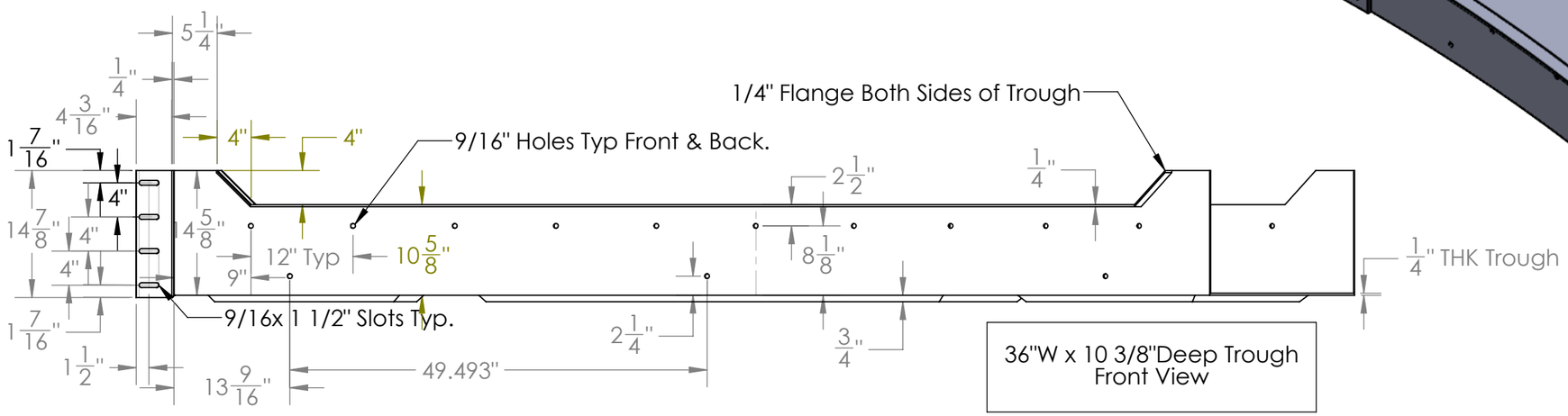
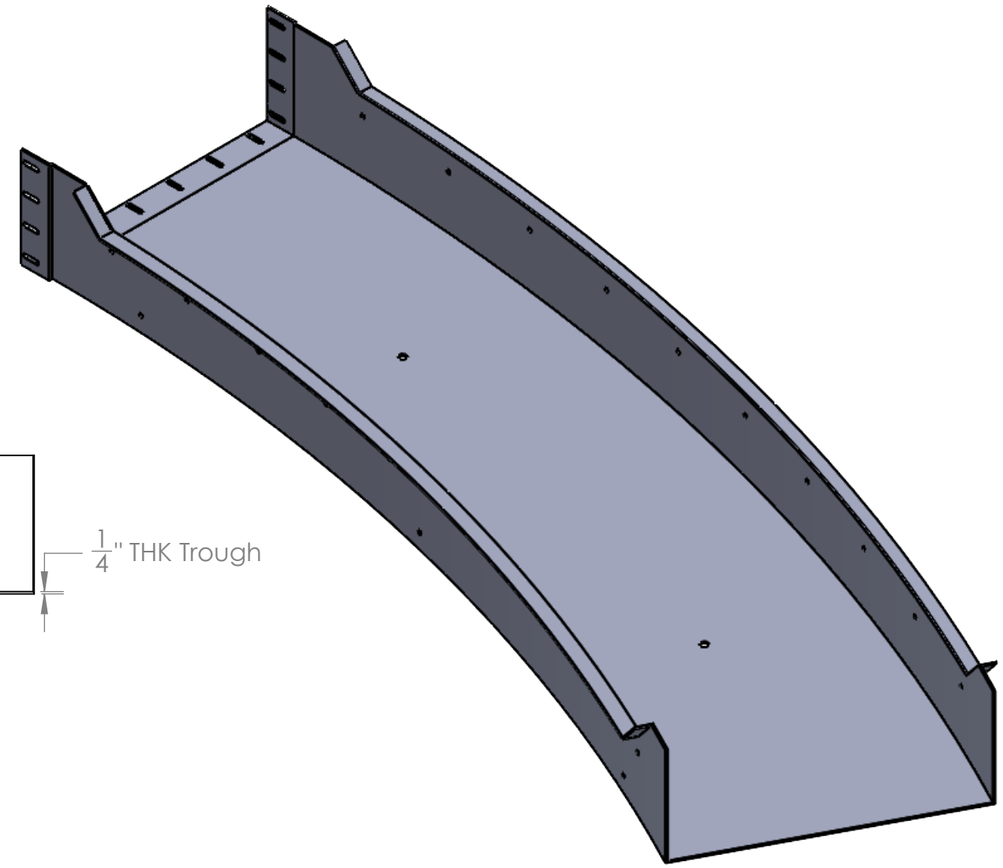
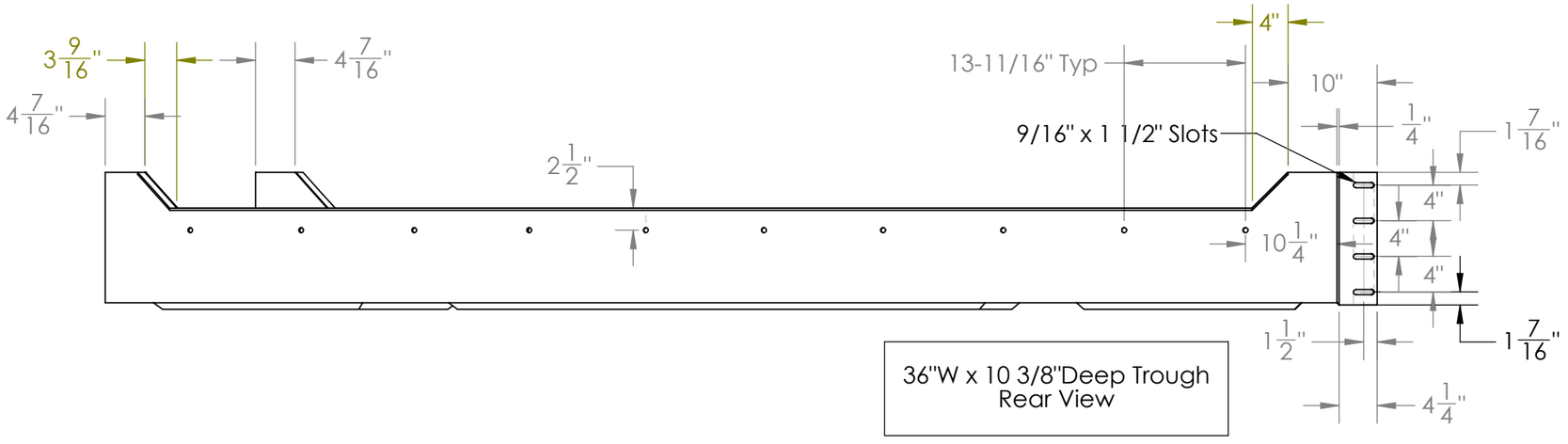


36"W x 10 3/8"Deep Trough
Front View





36"W x 10 3/8"Deep Trough
Rear View

SHEET NO.4	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS	NO.	REVISIONS	DATE	NATIONAL WATER TREATMENT PRODUCTS has no responsibility for the contract design of the product or the contract specifications. NWTP has been selected to manufacture this product, the customer agrees to indemnify and hold NWTP harmless from and against all merchantability and fitness for purpose (including all liability for claims, suits, judgements and expenses), unless the product as manufactured by NWTP does not confirm to the contract design and specifications set or NWTP's shop drawings approved by the customer.
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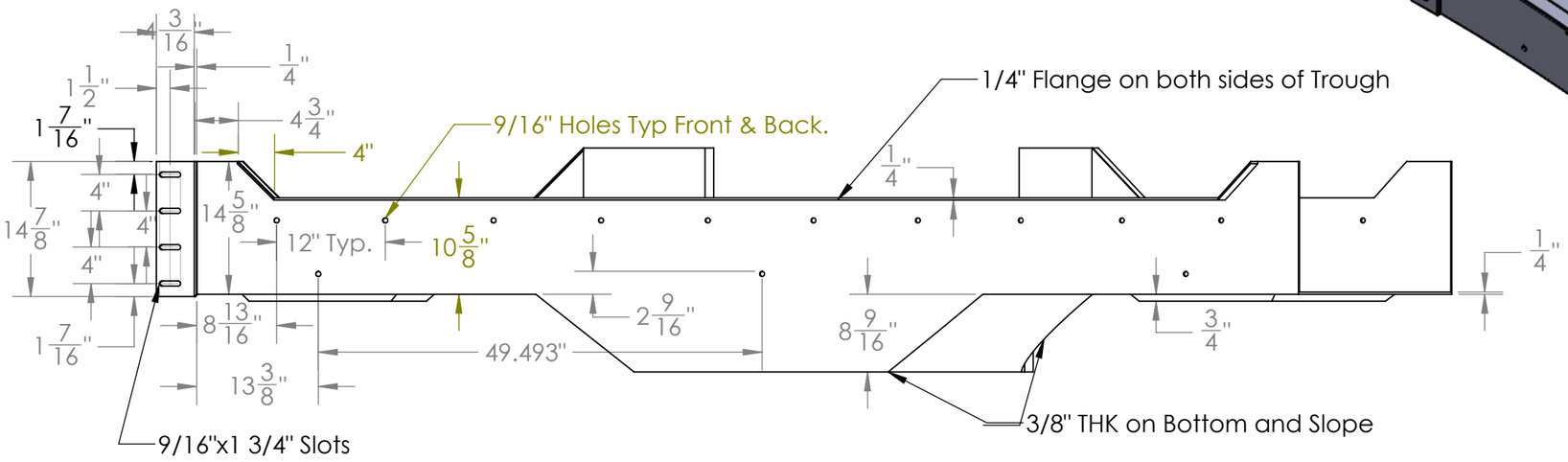
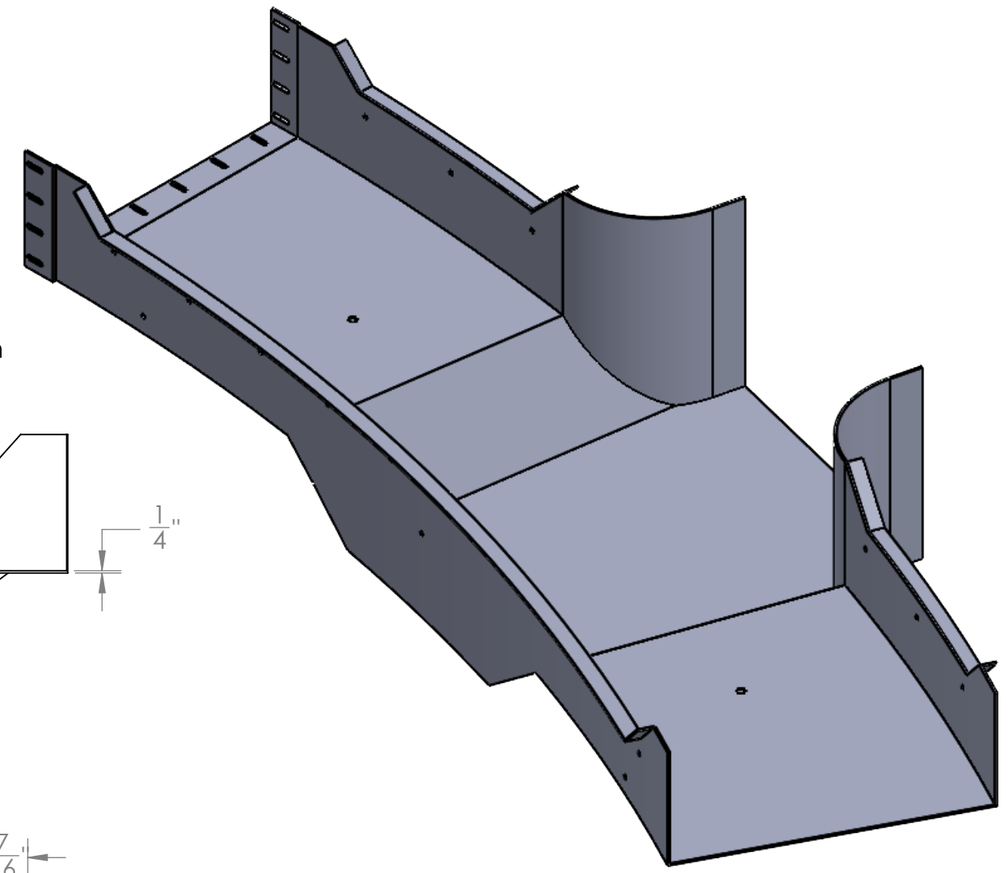
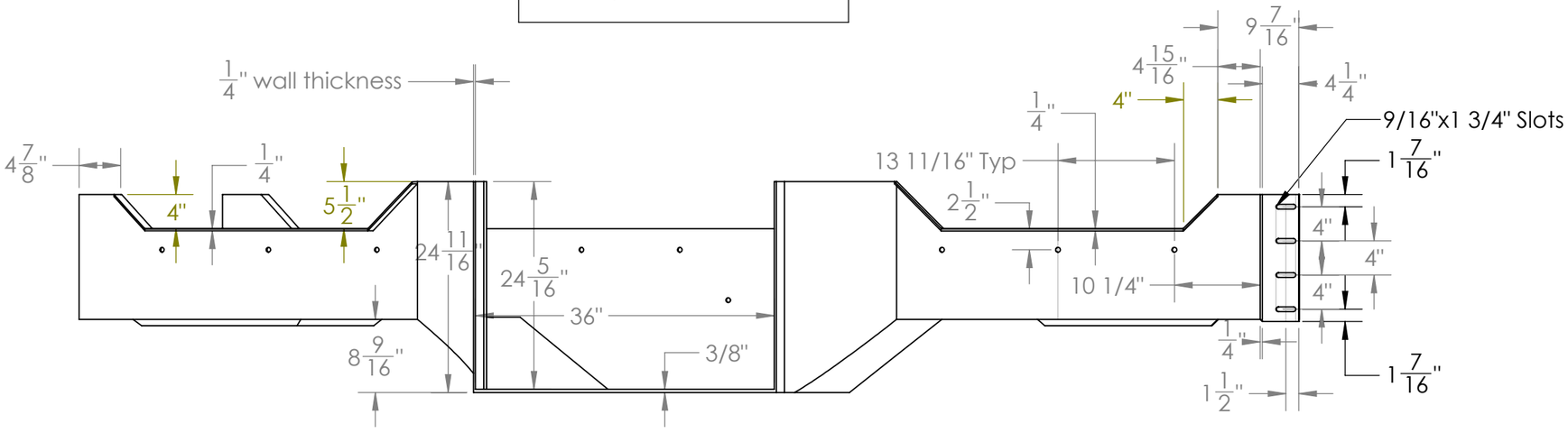


36"W x 10 3/8"Deep Trough
Drop Box Front View





36"W x 10 3/8"Deep Trough
Drop Box Rear View

SHEET NO.5	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS	NO.	REVISIONS	DATE	NATIONAL WATER TREATMENT PRODUCTS has no responsibility for the contract design of the product or the contract specifications. NWTP has been selected to manufacture this product, the customer agrees to indemnify and hold NWTP harmless from and against all merchantability and fitness for purpose (including all liability for claims, suits, judgements and expenses), unless the product as manufactured by NWTP does not confirm to the contract design and specifications set or NWTP's shop drawings approved by the customer.
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Mammoth, CA	APPROVED BY:					
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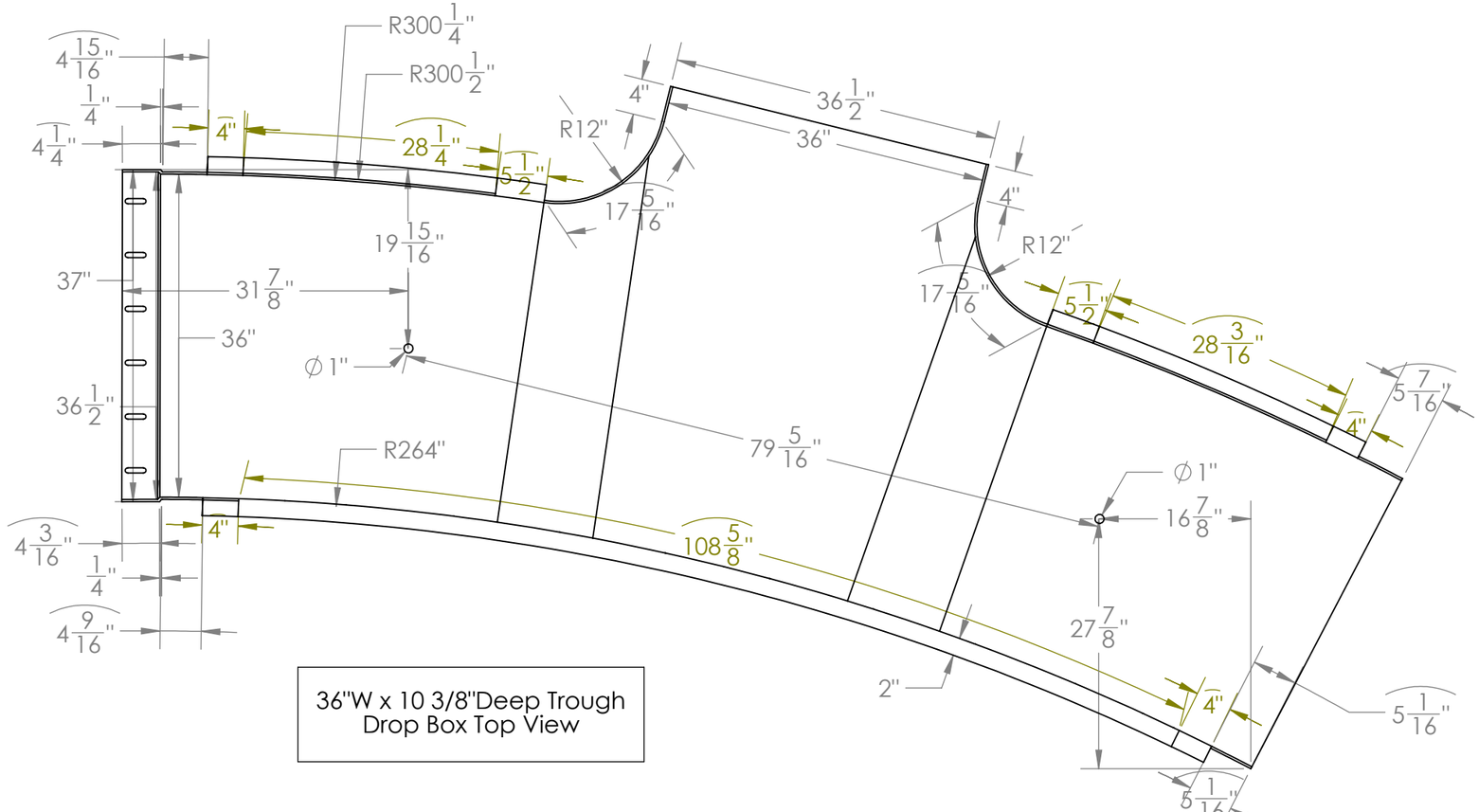
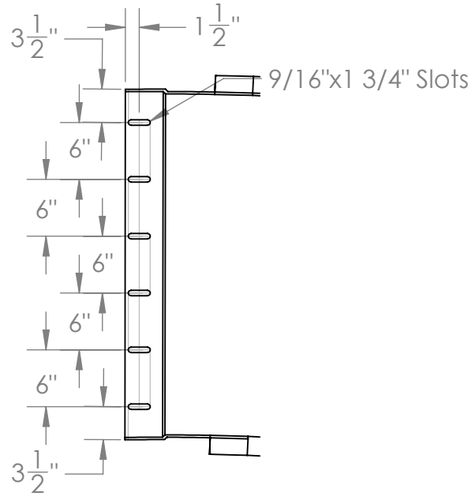
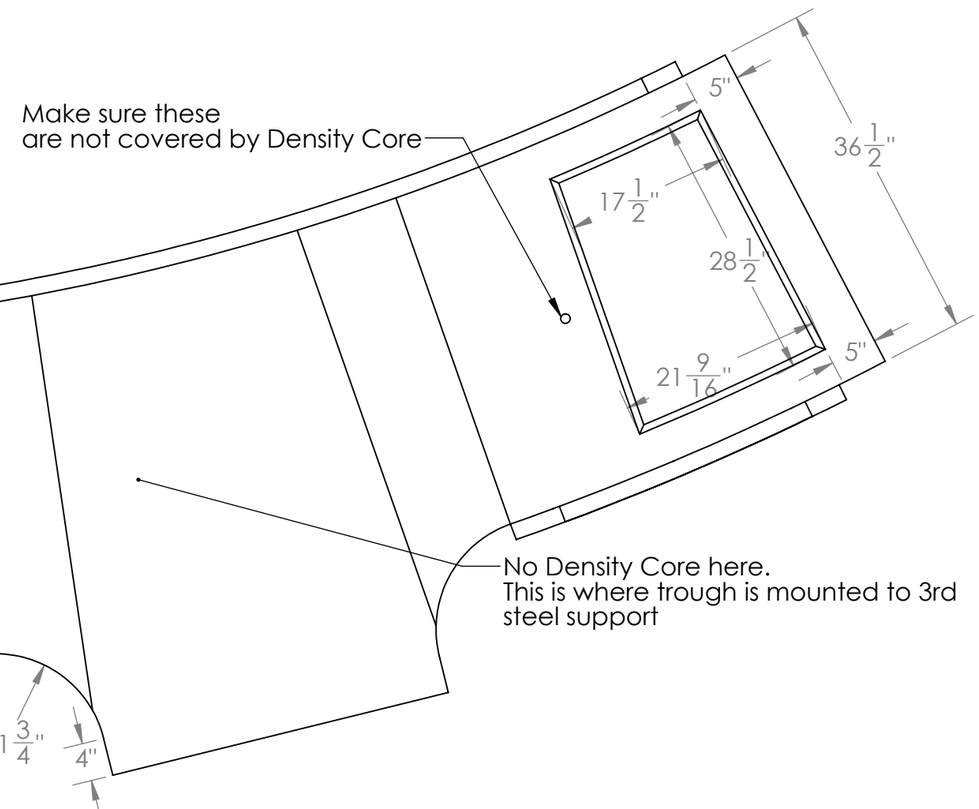


36"W x 10 3/8"Deep Trough
Drop Box Top View





Use 6LB Density
Core

36"W x 10 3/8"Deep Trough
Drop Box Bottom View

SHEET NO.6	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS	NO.	REVISIONS	DATE	NATIONAL WATER TREATMENT PRODUCTS has no responsibility for the contract design of the product or the contract specifications. NWTP has been selected to manufacture this product, the customer agrees to indemnify and hold NWTP harmless from and against all merchantability and fitness for purpose (including all liability for claims, suits, judgements and expenses), unless the product as manufactured by NWTP does not confirm to the contract design and specifications set or NWTP's shop drawings approved by the customer.
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	CHECKED BY:		2	Added C CHannel	3/19/25	
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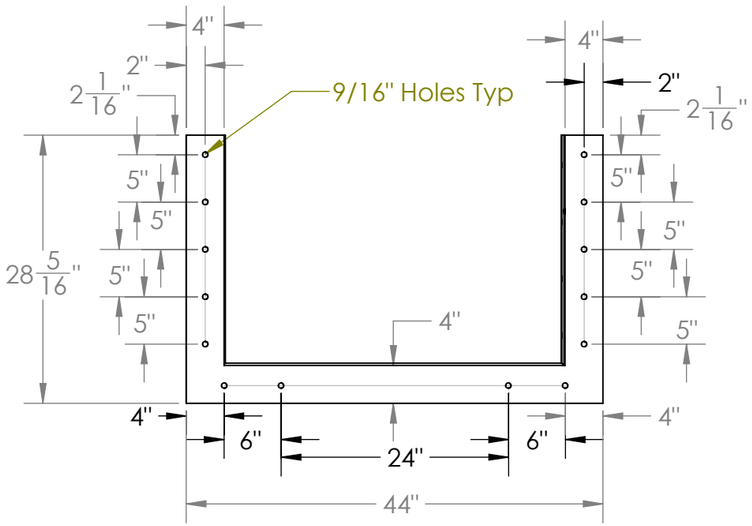
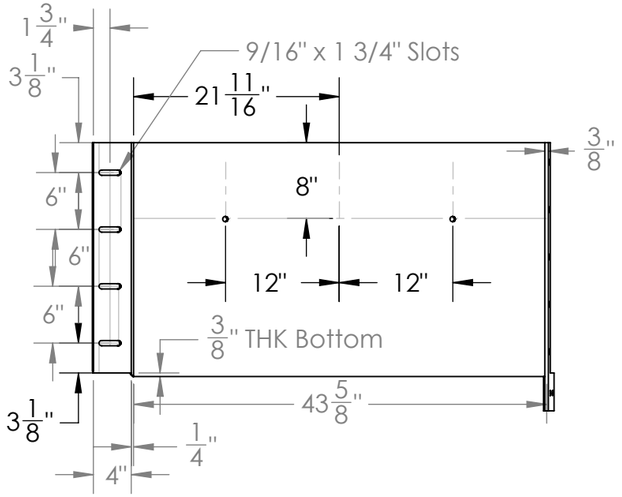
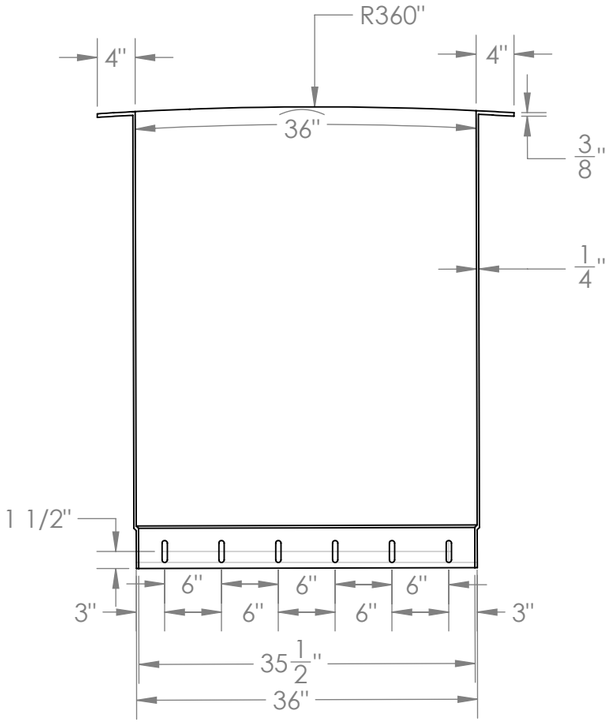
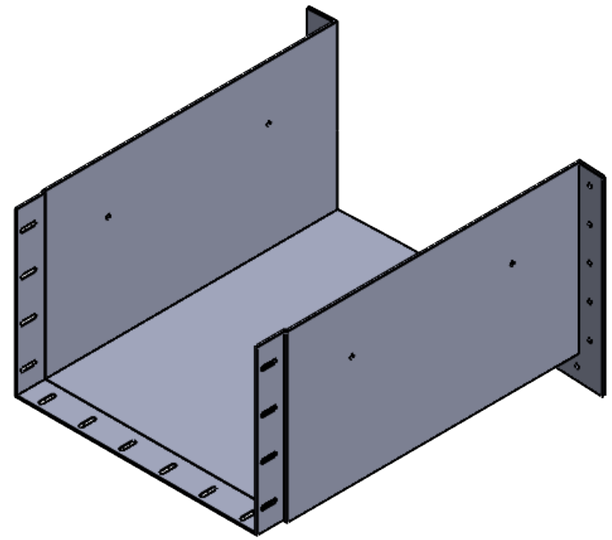
	DATE: 3/10/25					





36"W x 24 5/16"Deep Trough Connection





SHEET NO.7	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS	NO.	REVISIONS	DATE	NATIONAL WATER TREATMENT PRODUCTS has no responsibility for the contract design of the product or the contract specifications. NWTP has been selected to manufacture this product, the customer agrees to indemnify and hold NWTP harmless from and against all merchantability and fitness for purpose (including all liability for claims, suits, judgements and expenses), unless the product as manufactured by NWTP does not confirm to the contract design and specifications set or NWTP's shop drawings approved by the customer.
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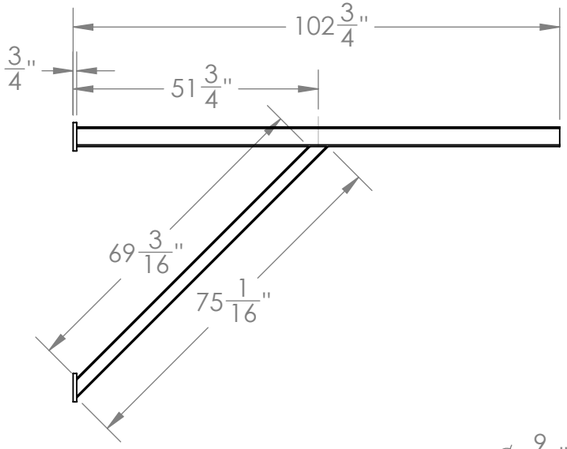
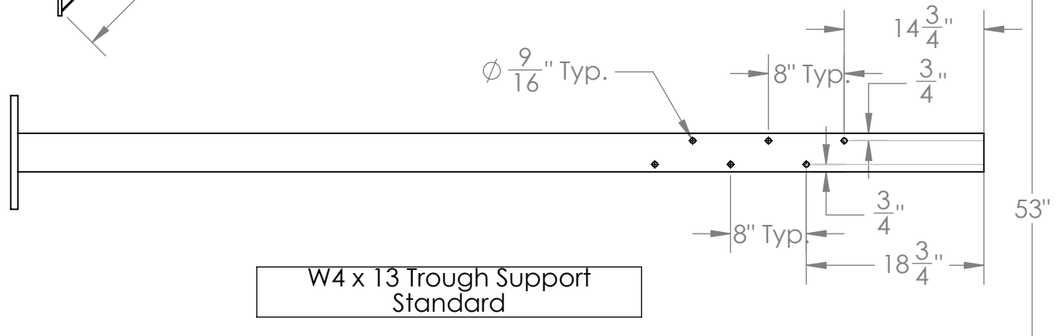
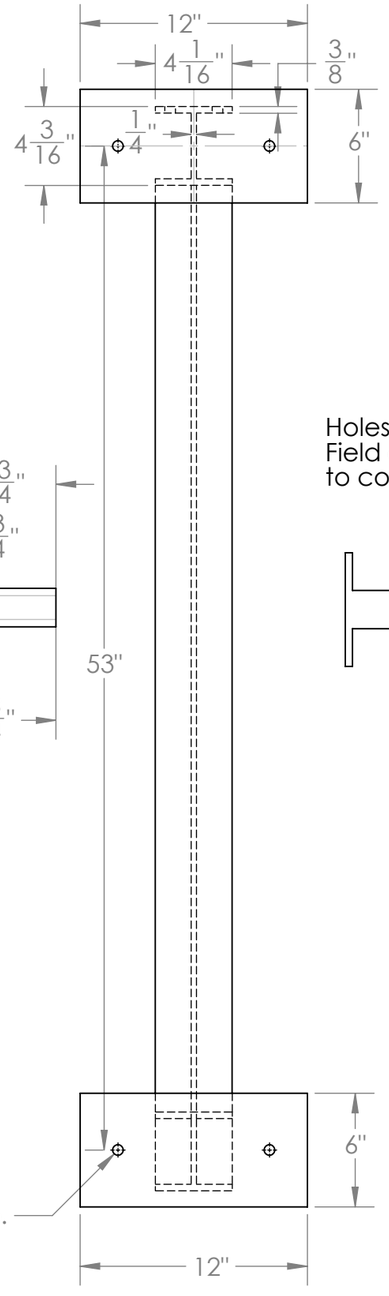
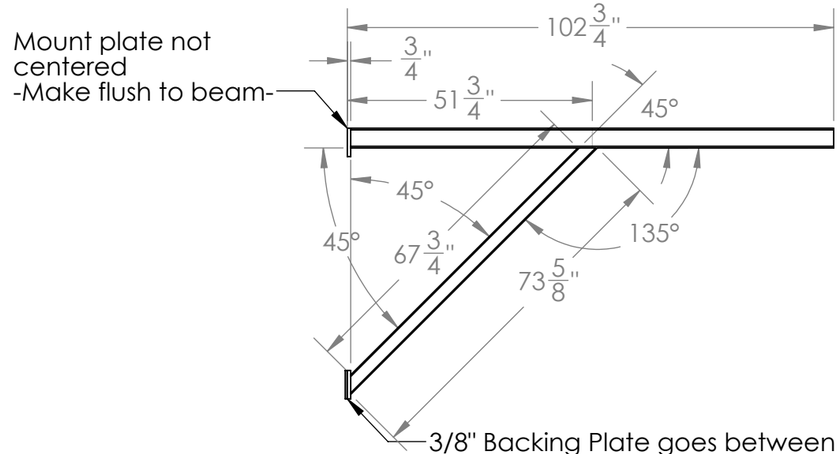




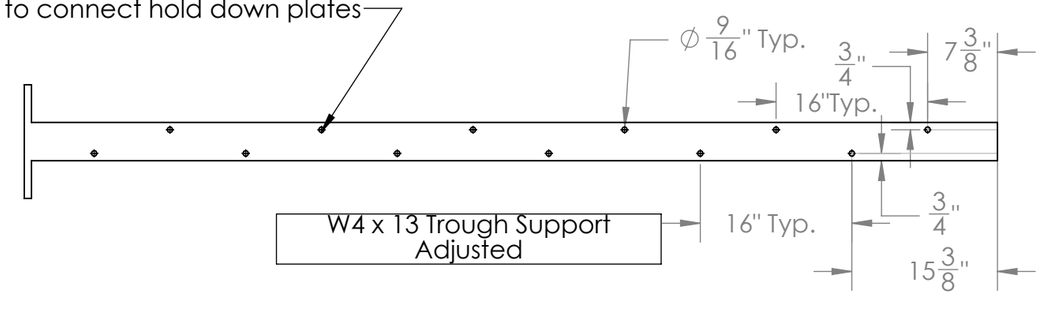
W4 x 13 Trough Support
Standard



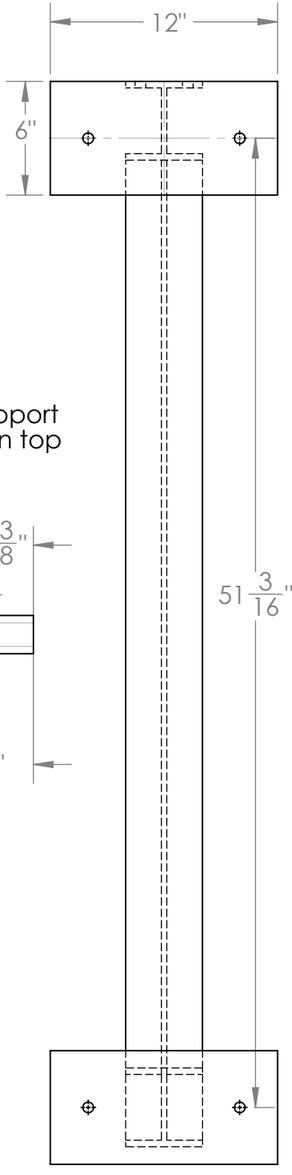


3/8" Backing Plate goes between support and tank wall to allow even off set on top and bottom. ONLY For this piece.

Holes are for
Field drilling into trough
to connect hold down plates



W4 x 13 Trough Support
Adjusted



SHEET NO.8	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS		NO.	REVISIONS	DATE
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Mammoth, CA	APPROVED BY:					
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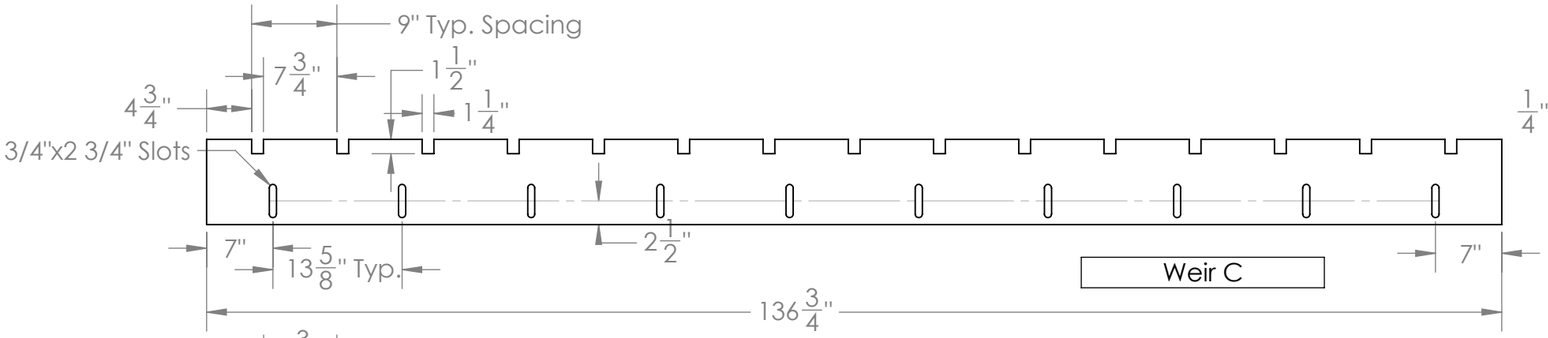

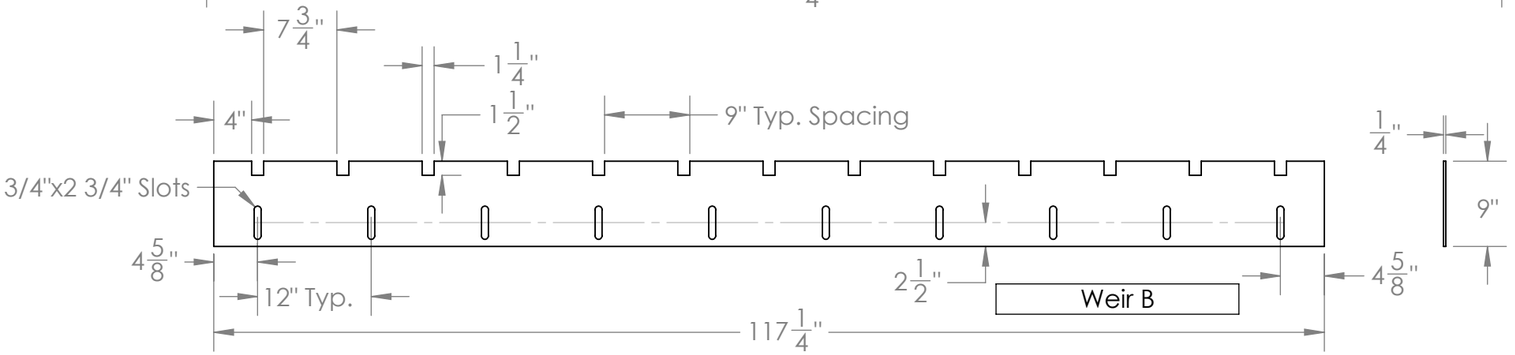

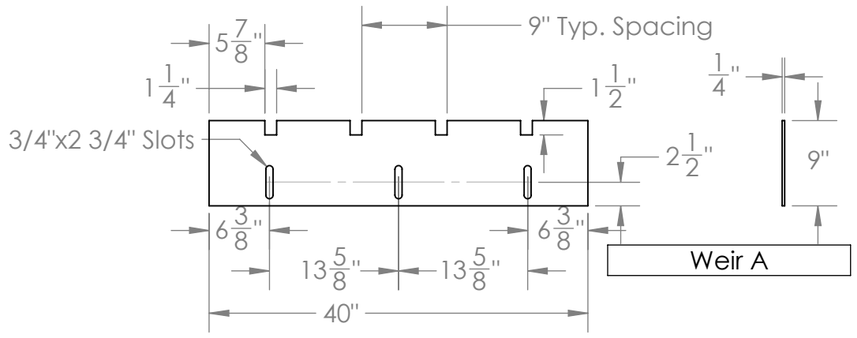

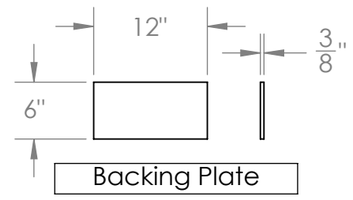

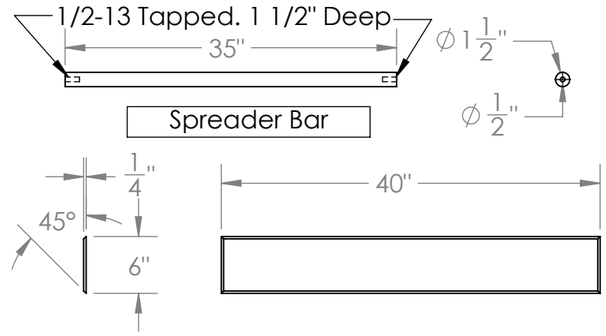

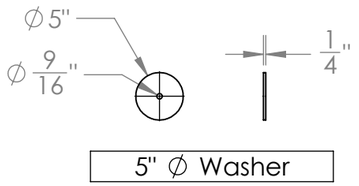

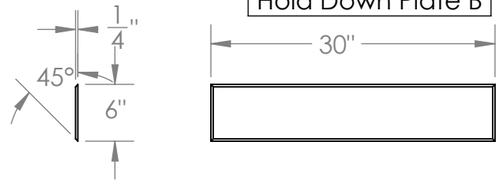

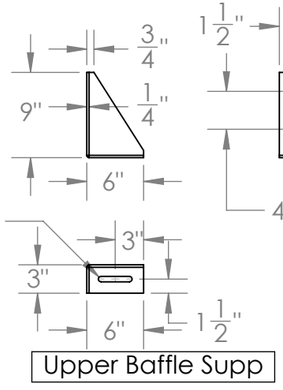

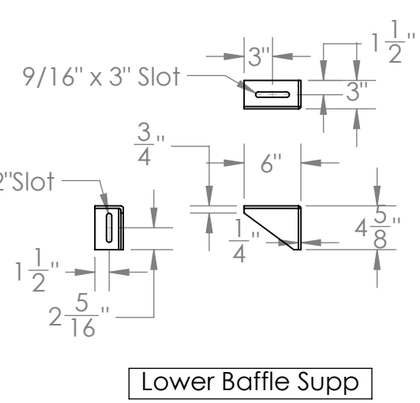

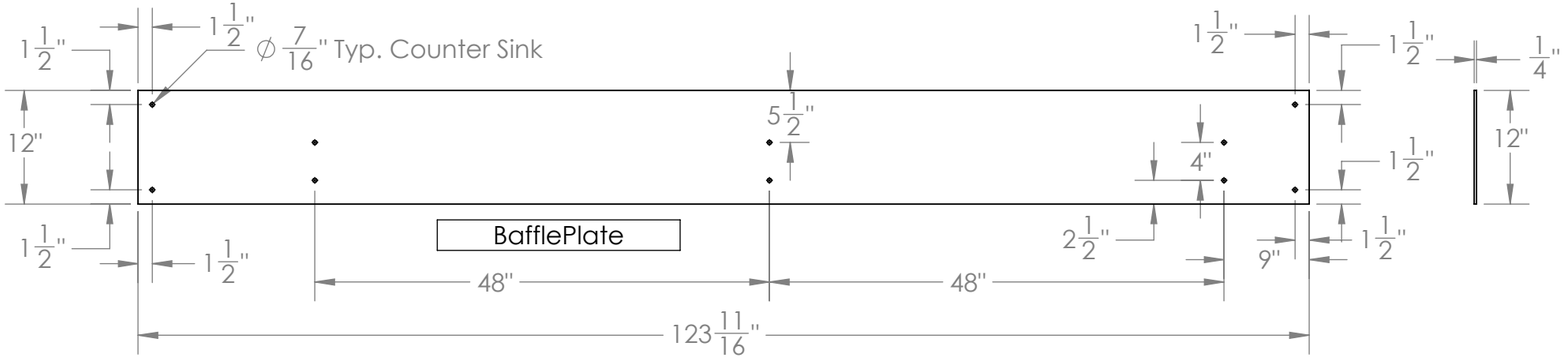

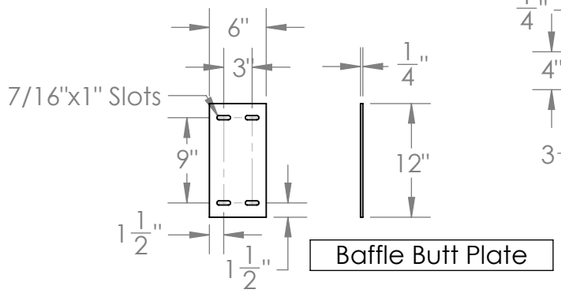

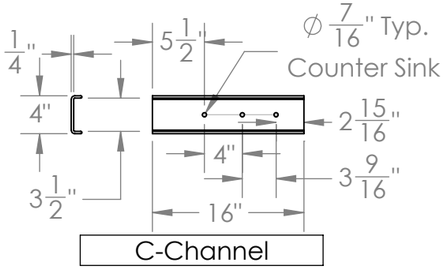

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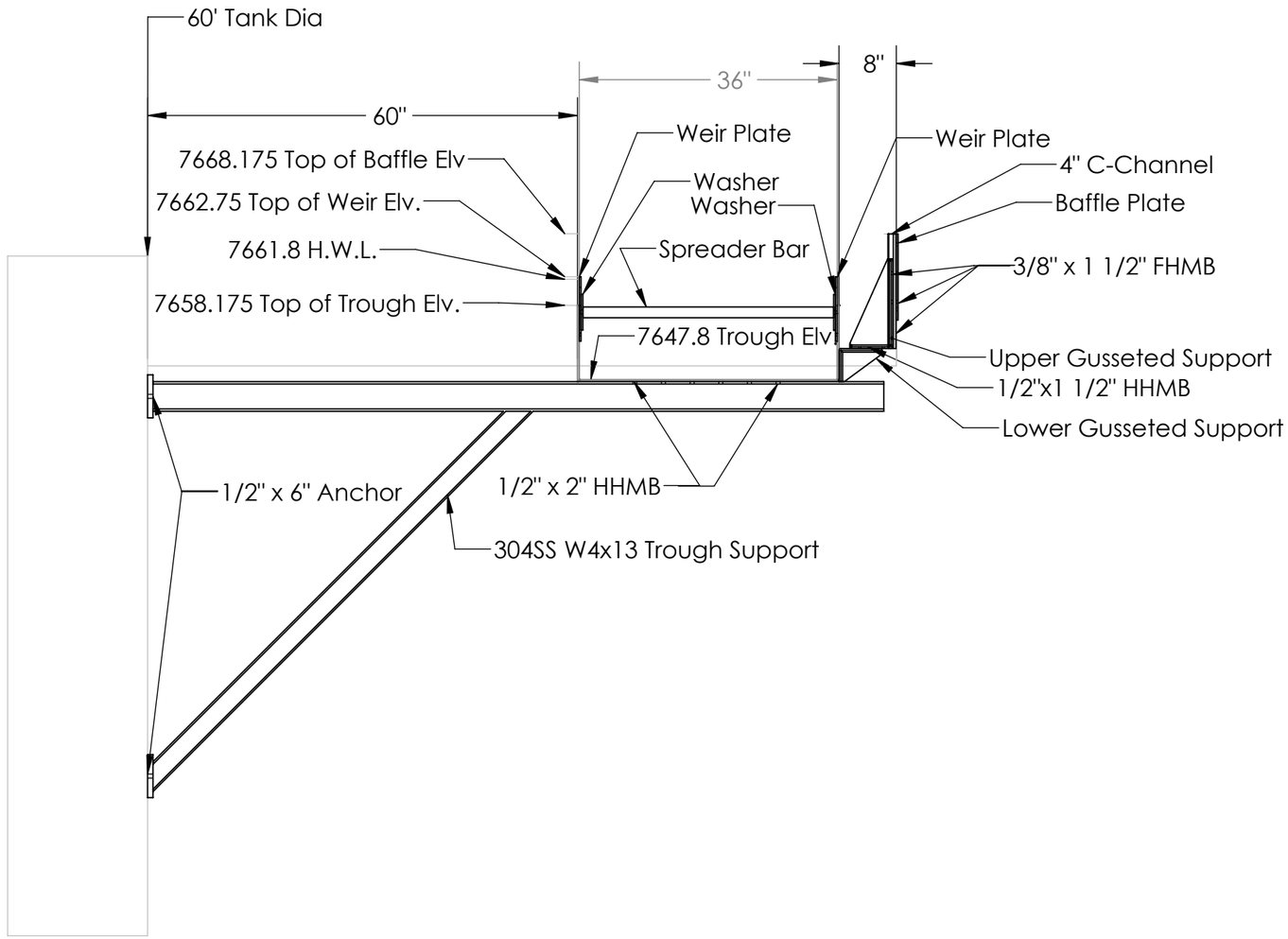

Mat.	QTY.	Description
	1	60∅ Tank(s)
FRP	12	36"W x 10 3/8"Deep Trough
FRP	1	36"W x 10 3/8"Deep Drop Box Trough
FRP	1	36"W x 24 5/16"Deep Trough Connection
FRP	2	9"H x 40"L x 1/4"THK Weir A
FRP	13	9"H x 117 1/4"L x 1/4"THK Weir B
FRP	12	9"H x 136 3/4"L x 1/4"THK Weir C
FRP	13	12"H x 123 11/16"L x 1/4"THK Baffle Plate
FRP	13	12"H x 6"L x 1/4"THK Baffle Butt Plate
FRP	39	Upper Gusseted Baffle Support
FRP	39	Lower Gusseted Baffle Support
FRP	39	C-Channel 4" x 1.125" x .25"
FRP	260	5"∅ Washer
FRP	1	6"H x 12"W x 3/8" THK Backing Plate
FRP	26	6"H x 30"L x 1/4" Hold Down Plate A
FRP	2	6"H x 40"L x 1/4" Hold Down Plate B
PVC	78	1 1/2"∅ Spreader Bar w/ 1/2-13 Tapped 1 1/2" Deep Ends
304SS	1	W4 x 13 Trough Support Adjusted
304SS	26	W4 x 13 Trough Support Standard
316SS	434	1/2" x 2" HHMB
316SS	229	1/2 x 1 1/2" HHMB
316SS	1066	1/2" ID Washer
316SS	507	1/2" Hex Nut
316SS	169	3/8" x 1 1/2" FHMB
316SS	169	3/8" ID Washer
316SS	169	3/8" Hex Nut
316SS	122	1/2" x 6" Anchors
NEO	15	5"W x 1/4"THK x 25'L #7402A SPONGE RUBBER W/PSA
Resin	1	Resin Kit

SHEET NO.10	DIVISION: NWTP	NATIONAL WATER TREATMENT PRODUCTS	NO.	REVISIONS	DATE	NATIONAL WATER TREATMENT PRODUCTS has no responsibility for the contract design of the product or the contract specifications. NWTP has been selected to manufacture this product, the customer agrees to indemnify and hold NWTP harmless from and against all merchantability and fitness for purpose (including all liability for claims, suits, judgements and expenses), unless the product as manufactured by NWTP does not confirm to the contract design and specifications set or NWTP's shop drawings approved by the customer.
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EXHIBIT F

WATERMAN SLIDE AND BUTTERFLY GATE SPECIFICATIONS

Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

Mammoth Lakes, CA

EXHIBIT F
TYPICAL SPECIFICATIONS FOR SS-250 SERIES FABRICATED SLIDE GATE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The equipment provided under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by the engineer.

Gates and operators shall be supplied with all the necessary parts and accessories indicated on the drawings, specified or otherwise required for a complete and properly operating installation, and shall be the latest standard product of a manufacturer regularly engaged in the production of fabricated water control gates.

B. Unit Responsibility: To insure compatibility of all components directly related to the slide gates, unit responsibility for the slide gates, actuators and accessories as described in this section shall be the responsibility of the slide gate manufacturer unless specified otherwise.

1.02 SUBMITTALS

A. Submittals shall be in accordance with Technical Specifications and as specified herein. Submittals shall include as a minimum:
   1. Shop Drawings
   2. Manufacturer's operation and maintenance manuals and information.
   3. Manufacturer's installation certificate.
   4. Manufacturer's equipment warranty.
   5. Manufacturer's performance affidavit in accordance with this seciton.
   6. Design calculations demonstrating lift loads and deflection in conformance to the application requirements. Design calculations shall be approved by a licensed engineer (PE) and shall be available upon request.

1.03 QUALITY ASSURANCE

A. Qualifications
   1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20-years of experience designing and manufacturing slide gates. The manufacturer shall have manufactured stainless steel slide gates of the type described herein for a minimum of 20 similar projects.

2. The sealing system shall be certified and tested for operation and performance to leakage specifications compliant with AWWA C-561 for a minimum of 100,000 cycles.
3. The project design is based on the Waterman SS-250 Series Fabricated Slide Gate as manufactured by Waterman Industries of Exeter, California. Proposed alternates must be pre-approved, per addendum, at least 14-days prior to close of bid. Requests for alternates must be supplemented with detailed drawings, specifications, and references. Any/all additional costs for structure modifications or other changes associated with utilizing a brand other than Waterman are to be borne by the contractor.
4. To insure quality and consistency, the slide gates listed in this section shall be manufactured and assembled in a facility owned and operated by the slide gate manufacturer. Third-party manufacturers contracted for fabrication and assembly of the slide gates will not be permitted.

PART 2 EQUIPMENT

2.01 GENERAL

A. The gates shall be either self-contained with yoke and bench stand operators, or non-self-contained with separate stem guides and operator, in accordance with the requirements of these specifications.
B. The gates shall be compliant with the latest version of AWWA C561 as described below.
C. Specific configurations shall be as noted on the gate schedule or as shown on the plans.
D. Materials:

COMPONENTS	MATERIALS
Frame, Yoke, Cover Slide, Wall Thimbles	**Stainless Steel ASTM A240, Type 316**
Seat/Seals & Stem Sleeves	**Ultra High Molecular Weight Polyethylene (UHMWPE) ASTM D-4020**
Cord Seal	**Neoprene ASTM D 2000**
Flush Bottom Seals	**Neoprene ASTM D 2000**
Stems	**Stainless Steel: ASTM A-276, AISI Type 316**
Stem cover	**Clear Butyrate With Mylar Strip**
Stem Guides	**Stainless Steel (ASTM A-240 – Type 316L) UHMW Bushed**
Wall Brackets	**Stainless Steel: ASTM A-240, AISI Type 316L**

Pedestals	**Stainless Steel: ASTM A-240/A-312, AISI Type 316**
Fasteners and Anchor Bolts	**Stainless Steel: ASTM A-593 and 594, Type 316 CW**
Finish	**Polyamide Epoxy**

E. Gate Schedule:

Equipment Number	Gate Size, inch[1]	Gate type[2]	Opening Direction[3]	Bottom Seating[4]	Design Head, feet		Operator Type
					Seating	Unseating	
36 x 36 B-1499	36	E	U	FB	15	15	Pedestal handwheel

Notes:

1. Clear opening width by height.
2. E = embedded frame, W = wall mounted, Y = self-contained, F = flatback
3. U = upward, D = downward
4. FB = flush bottom

2.02 FRAME AND GUIDE RAILS

A. The gate frame shall be composed of stainless steel guide rails with UHMW seat/seals upstream and downstream. The seat/seals shall form a tight seal between the frame and the slide (disc). The guides will be of sufficient length to support ½ the height of the slide when in the full open position.

B. Yoke shall not deflect more than 1/360th of the span under full head break load.

C. Seals shall be replaceable without removing the frame from the wall. In the case of embedded gates, they shall be constructed in a manner that allows replacement of the seals without removal of the gate frame from the embedment.

2.03 STEM AND STEM GUIDE

A. Material
   1. The stem shall be solid stainless steel of the specified grade.

B. Design
   1. Guides shall be adjustable with split stem sleeves. Guides shall be spaced per the manufacturer's recommendations. The stem L/r ratio shall not exceed 200.

2. Stem threads shall be machine-cut 29-degree full Acme or stub Acme type.
3. Nominal diameter of the stem shall not be less than the crest of the threaded portion.

2.04 SEALS

A. The seals shall be self-adjusting. Seals requiring periodic maintenance and adjustments to maintain specified leakage rates will not be permitted.
B. The top seal design on upward opening gates consisting of four side seals shall incorporate a self-cleaning wiping function that prevents debris from building-up above the top seal and causing premature wear of the seats, seals, and gate face.
C. The UHMW seats shall impinge on the slide (disc) by way of a continuous loop cord seal. Seal designs incorporating resilient seals such as “J-bulb” or “P” seals that come in direct contact with the friction surface of the slide will not be considered.
D. The cord seal shall function as a seal between the frame and the UHMW, and as a spring force to maintain contact between the UHMW and the slide (disc).
E. The resilient bottom seal shall be set into the invert member of the frame which shall be formed in a manner to protect 3 sides of the seal only exposing the side that will come in contact with the slide. Disc-mounted invert seals exposing additional surface area will not be permitted.
F. The self-adjusting seal system shall provide an allowable leakage rate of no more than ½ AWWA leakage rate per minute per peripheral foot of perimeter opening for seating and unseating heads.

2.05 SLIDE COVER (DISC)

A. The slide cover (disc) shall be stainless steel plate reinforced with structural shapes welded to the plate.
    1. The slide cover shall not deflect more than 1/720th of the span, or 1/16” at the seated sealing surface of the gate under maximum specified head.
    2. The stem to gate connection shall be either the clevis type, with structural members welded to the slide and a bolt or bolts to act as a securing method, or a threaded and bolted (or keyed) thrust nut supported in a welded nut pocket.
    3. The clevis, or pocket and yoke, of the gate shall be capable of taking, without damage, at least twice the rated thrust output of the operator at 40 pounds of pull on a hand wheel or hand crank, and at locked-rotor stall of a motor operator.
    4. The slide cover shall be constructed with vertical and horizontal reinforcement ribs.
    5. All welds shall be performed by an AWS-certified welding technician.

2.06 ANCHOR BOLTS

A. Anchor hardware shall be provided by the slide gate manufacturer.
    1. The size, quantity, and location of the anchor hardware shall be engineered by the slide gate manufacturer. Upon client request manufacturer shall provide calculations for anchor bolt sizing and quantity.
    2. Anchor hardware consisting of studs, nuts and washers shall be provided by the manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation of the gates shall be performed in accordance with standard industry practices. It shall be the responsibility of the CONTRACTOR to handle, store, and install the equipment specified in this Section in strict accordance with the Manufacturer's recommendations.
B. The CONTRACTOR shall review the installation drawings and installation instructions prior to installing the gates.
C. The gate frames shall be installed in a true vertical plane, square and plumb, with no twist, convergence, or divergence between the vertical legs of the guide frame.
D. The CONTRACTOR shall fill any void between the guide frames and the structure with non-shrink grout as shown on the installation drawing and in accordance with the grout manufacturer's recommendations.
E. The frame cross rail shall be adjusted as required to maintain consistent seal compression across the full width of the gate.

3.02 FIELD TESTING

A. After installation, all gates will be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. Each gate assembly shall be water tested by the CONTRACTOR at the discretion of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowed leakage.

END OF SECTION
NOTHING FOLLOWS

EXHIBIT F
RECTANGULAR BUTTERFLY GATE SPECIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install and ready for operation rectangular butterfly gates, as shown on the Contract Drawings and as specified herein.

1.02 SUBMITTALS

A. Provide the following information to confirm compliance with the specification in addition to the submittal requirements specified in the Technical Specifications.
   1. Complete description of all materials including the material thickness of all structural components of the rectangular butterfly gate.
   2. Installation drawings showing all details of construction, details required for installation, dimensions and anchor bolt locations.
   3. The location of the company headquarters and the location of the principle manufacturing facility.

1.03 QUALITY ASSURANCE

A. Qualifications
   1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20 years experience designing and manufacturing rectangular butterfly gates. The manufacturer shall have manufactured rectangular butterfly gates for a minimum of 100 projects.
   2. The specification is based on stainless steel rectangular butterfly gates as manufactured by Waterman Valve of Exeter, CA, a McWane company.
   3. The rectangular butterfly gate specified under this Section shall be NSF/ANSI 61 compliant and approved.
   4. To ensure quality and consistency, the butterfly gates listed in this section shall be manufactured and assembled in a facility owned and operated by the butterfly gate manufacturer. Third party manufacturers contracted for fabrication and assembly of the butterfly gates will not be permitted.

PART 2 EQUIPMENT

2.01 GENERAL

A. Rectangular butterfly gate assemblies shall be as specified herein and have the characteristics and dimensions shown on the Contract Drawings.
B. Leakage shall be bubble tight at the specified water head pressure.
C. Valve design shall be for 15 PSIG maximum.
D. The rectangular butterfly gates shall be provided with a continuous, adjustable resilient seal around the perimeter of the gate vane for a 4-side seal gate and along the bottom edge and up

the entire side lengths of the gate vane for a 3-side seal gate. Resilient seals shall be mechanically fastened to the gate vane for either the 4-side seal gate or the 3-side seal gate.

E. Rectangular butterfly gates shall be of the height and width as shown in the Contract Drawings and they shall be designed to function properly if operated in either a clockwise or counter-clockwise direction.

F. All structural components of the rectangular butterfly gates shall be fabricated of stainless steel and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.

G. All welds shall be performed by welders with AWS certification.

H. Finish: Mill finish on stainless steel. Mild steel shall be blasted per SSPC-SP6 and painted with a polyamide epoxy to a total thickness of 11 mils. Welds on stainless steel shall be passivated and pressure washed to remove weld burn and scale.

I. Materials:

Components	Materials
Rectangular butterfly gates	Type 316/316L Stainless Steel
Lip Seal	EPDM
Anchor Studs, Fasteners and Nuts	Stainless Steel, Type 316
Pivot bushings	Teflon lined, fiber backed sleeve.
Pivot shafts	ASTM A 276 Type 316
Vane securing taper pins	ASTM A 564 Grade 630 Condition H1150
Axial load disc	ASTM A 240 Type 316
Axial load thrust bearings	ASTM A 6712 UHMWPE

2.02 RECTANGULAR BUTTERFLY GATE FRAME

A. The rectangular butterfly frame tubing shall be constructed of material with a minimum thickness of ¼ inch.
   1. Each rectangular butterfly gate frame aperture shall be of a height and width indicated on the Contract Drawings.
   2. Two lifting eyes shall be provided on the top of each rectangular butterfly gate for the attachment of a lifting/hoisting system.
   3. Stainless steel seats shall be full watertight welded into the frame body.
   4. 4 side seal gate frames shall be fitted with an adjustable packing on the upper stem.
   5. Each rectangular butterfly gate shall be outfitted with an identification tag indicating the manufacturer, the serial number of the gate, and the year of gate manufacture. The identification tag shall also accommodate a gate number designation and a gate location designation.

2.03 RECTANGULAR BUTTERFLY GATE VANE

A. The rectangular butterfly vane shall be constructed of material with a minimum thickness of 1 inch.
   1. Each rectangular butterfly valve vane shall be machined to accept a continuous, one-piece elastomeric seal.
   2. The gate vane shall be fabricated with a contour intended to prevent turbulence across the vane cross section in the fully open position.
   3. Exposed vane stiffening members are not allowed.
   4. Each rectangular butterfly valve vane shall have a series of stainless steel hardware around the perimeter of the vane, both to secure the seal and allow adjustment of the seal compression against the frame seats.

2.04 VALVE SHAFTS

1. The valve pivot shafts shall be of the stub type that extend into the vane for a minimum distance of at least 1.5 shaft diameter.
2. Pivot shafts shall be secured to gate vane by tapered high strength stainless steel pins that are match reamed and fitted to the vane and pivot shafts.
3. The upper stem shall be fitted with an adjustable axial load disc that will center the vane in the gate frame aperture in a 4-side seal gate or load the bottom seal in a 3-side seal gate.

2.05 SEALS

A. Each rectangular butterfly gate shall be outfitted with a continuous resilient seal around the sealed faces of the vane to restrict leakage in accordance with the requirements listed in this specification.
   1. The seal shall be constructed of rubber or EPDM and shall be mechanically retained to the gate vane.
   2. The seal shall be activated by an adjustable retention system, which pushes the seal against the gate frame mounted, stainless steel seat.

2.06 ANCHOR BOLTS

A. Anchor bolts shall be provided by the rectangular butterfly gate manufacturer for mounting the guide frames.
   1. Quantity and location shall be determined by the rectangular butterfly gate manufacturer.
   2. If epoxy type anchor bolts are provided, the rectangular butterfly gate manufacturer shall provide the studs and nuts.
   3. For thimble type mounting, a generous amount of a mastic compound is suggested. If an elastomeric gasket is used, it will the responsibility of the CONTRACTOR.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation of the rectangular butterfly gate and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the CONTRACTOR to handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's recommendations.
B. The CONTRACTOR shall review the installation drawings and installation instruction prior to installing the gates.
C. If the gate is double-nut-and-grout mounted, the CONTRACTOR shall fill the void in between the gate frame and the wall with non-shrink grout as shown on the installation drawing and in accordance with the manufacturer’s recommendations.

3.02 FIELD TESTING

A. After installation, rectangular butterfly gates shall be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. Each rectangular butterfly gate assembly shall be water tested by the CONTRACTOR, at the discretion of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowable leakage.

SS-250 STAINLESS STEEL SLIDE GATES

- SIZES 6" TO 168"
- STAINLESS STEEL SLIDE AND FRAME WITH SELF-ADJUSTING SEAL SYSTEM
- RATED FOR LOW, MEDIUM, AND HIGH-PRESSURE APPLICATIONS

MARKETS

WATER/ WASTEWATER

CIVIL

INDUSTRIAL

SPECIFICATIONS

Head Pressures	Low, medium, and high-pressure applications
Size Range	Width: 6"-168", Height: 6"-168"
Frame, Yoke, & Slide Material	Stainless steel ASTM A-240 Type 304 or 316
Mounting	Direct wall mounted, wall thimble mounted, embedded channel mounted, surface channel mounted and pipe flange mounted
Stem Material	Stainless steel ASTM A-276 Type 304 or 316
Mounting Orientation	Vertical or at an incline with oil seal assembly
Seat Material	Ultra-High Molecular Weight Polyethylene (UHMW) ASTM D-4020
Actuation	Non-geared manual, geared manual, electric motor, 2" nut
Sealing Material	Neoprene ASTM D-2000, EPDM ASTM D-2000, or Viton ASTM D-1418
Design/Test Standard	AWWA C-561, NSF 61 & NSF 372 certified
Assembly and Mounting Hardware	Stainless steel ASTM F-593 & F-594 Type 304 or 316

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Scan for detailed drawings

1. High-Strength Stainless Steel Construction

The SS-250 Series features a fabricated stainless steel frame and slide assembly designed to withstand demanding service conditions. Gates are available in SS-304 and SS-316 stainless steel based on corrosion-resistance requirements. This high-strength construction provides excellent resistance to fatigue and structural deformation. The frame and slide are available in a wide range of standard and custom sizes to meet specific project requirements.

2. Advanced Self-Adjusting Seal System

The SS-250 Series uses the self-adjusting seal system with UHMW guides, which provides a smooth sliding surface for low-friction operation. The UHMW surfaces also prevent metal-to-metal contact, preventing galling and supporting dependable long-term sealing performance and operation even after extended periods of inactivity.

The Seal System limits leakage to less than 0.05 gallons per minute per foot of sealing perimeter under both seating and unseating head conditions. This is half of the allowable leakage requirements per AWWA C561. The Seal System has been tested for over 100,000 operating cycles with negligible wear, demonstrating reliable sealing performance in demanding water and wastewater applications.

3. Highly Configurable Design for Flexible Mounting and Operation

The SS-250 Series is available in a wide range of configurations. Gates can be used in 4-sided or 3-sided sealing applications with upward-opening or downward-opening (weir) operations. Available mounting configurations include direct wall, wall thimble, embedded channel, surface channel, and pipe flange mounting, with custom mounting options offered to suit specific civil structures. This customization ability makes SS-250 a perfect choice for both new construction and retrofit water control projects.

The gate frame can be configured as self-contained or non-self-contained, based on the distance from invert of gate opening to operating structure and the where the operating thrust will need to be absorbed by the integrated yoke or the civil structure.

Additional options include bottom seals, stem configurations, operator types, operator mounting type, and material selections for gate, accessories and hardware. All these options make the SS-250 Slide Gate versatile and highly configurable to meet any operating and installation requirements.

4. Designed for Ease of Maintenance

The SS-250 Series is engineered with ease of maintenance in mind. The self-adjustable seal system is designed to allow sealing components to be inspected and replaced without removing the gate frame from the wall, significantly reducing maintenance time and eliminating the need for costly structural disassembly.

5. NSF Certified for Potable Drinking Water

The SS-250 Series complies with NSF/ANSI 61 and NSF/ANSI 372 making it suitable for potable drinking water system components. Its corrosion-resistant stainless steel construction makes it ideal for a wide range of applications, including wastewater treatment plants, irrigation systems, potable water facilities, and demanding industrial environments.

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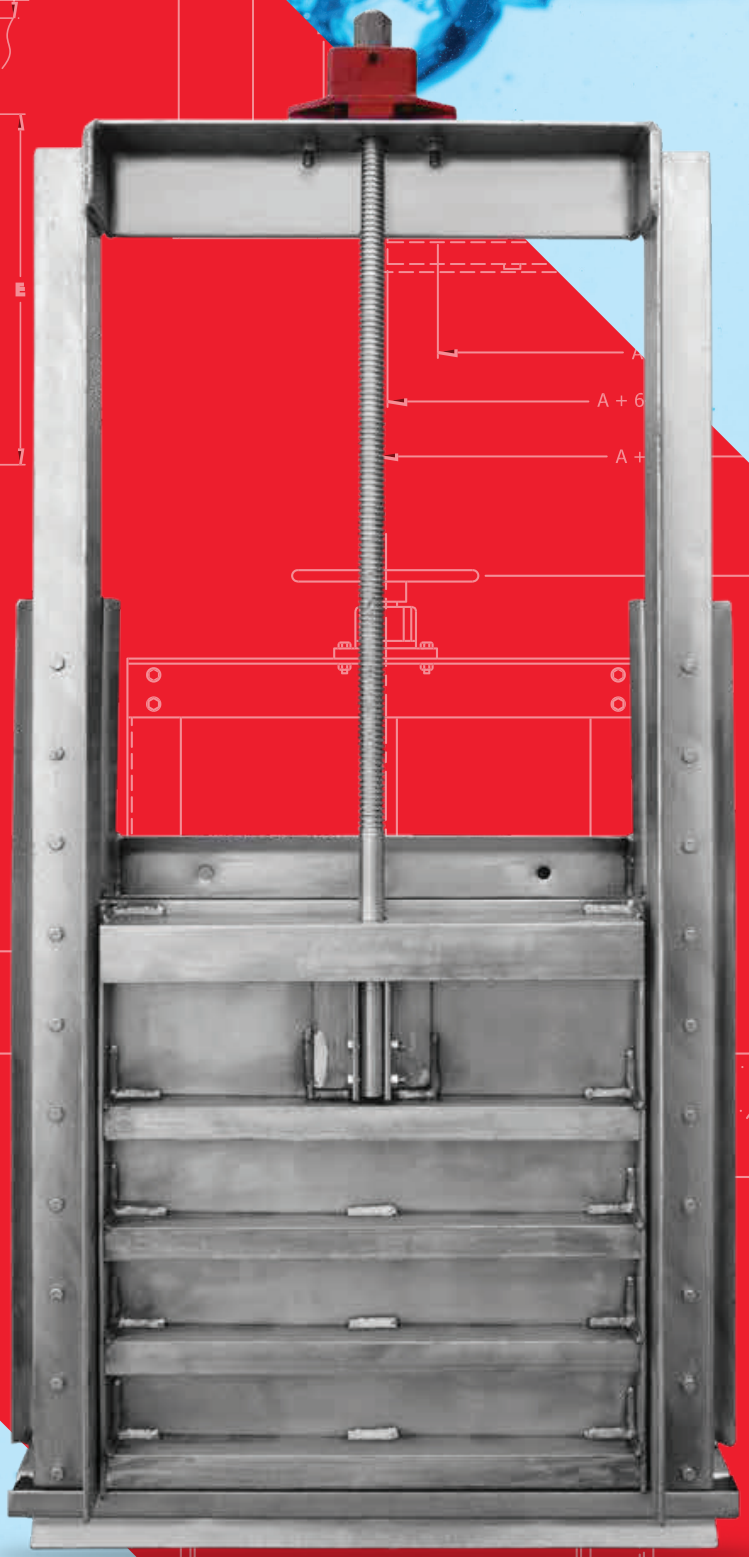
STAINLESS STEEL SLIDE GATES

SS-250 Series

AWWA C561 Compliant
NSF 61/372 Compliant
Open Channel, Sluice and Weir Configurations

mcwanepi.com



Waterman
A MCWANE PLANT & INDUSTRIAL SOLUTION

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SS-250 SERIES STAINLESS STEEL FABRICATED SLIDE GATES

COMPANY OVERVIEW

The experts at Waterman have custom-engineered thousands offlow control gates for projects worldwide. Waterman's team excels at developing innovative custom solutions to project needs. Our commitment to a highly-trained, customer-focused engineering department is unmatched by our competitors. Using computer modeling technology and finite element analysis, Waterman has systematically improved the design and construction of fabricated gates.

PRODUCT OVERVIEW

Best-in-class fabricated water control gates provide reliable performance for water, wastewater and hydropower applications. They are noted for their excellent sealing / leak resistance and for their long service life. Each gate is custom-designed to your project's requirements including seating and unseating heads incorporating safety factors per AWWA standards. SS-250 series gates conform to NSF 61/NSF 372.

KEY ADVANTAGES AND PERFORMANCE

- Built for longevity and corrosion resistance high strength 304L stainless steel and low-friction UHMW PE sliding and sealing surfaces lengthen the life of the gate. Optional 316L or 2205 stainless steel for use in unusually corrosive environments.
- Guardian® seal system (US Patent #8,820,711) dramatically increases seal life in both top and flush-bottom seals. Reduces leakage at critical corner joints. Offers superior performance to competitors' UHMW J-seal designs. No metal-to-metal contact prevents gate "sticking" and allows reliable open/close even after years of no operation.
- Best in class leakage performance Guardian® UHMW PE continually self-adjusting seal system offers leakage rates up superior to the AWWA C561/C562 specification. Waterman will guarantee leakage of no more than 0.05 gpm/ft of seal perimeter in seating head and unseating head conditions including high head service. The sealing system has been tested for 100,000 cycles (4x leading competitor) and continued to outperform the AWWA leakage specification with only negligible wear.

OPTIONS

• Models for normal aperture configuration, channel (embedded or surface mounted) as well as weirs (downward opening,
often applied for decant and level control)

• SS-250 can be ordered as self-contained gates or with extension stems and separate operators.

• Gate frames can be embedded in channel walls, mounted to a wall with anchor bolts, mounted to a pipe flange or wall thimble.
(Waterman offers a complete line of wall thimbles including "F", "E", "spigot style" as well as custom configurations.)

• "Q" seal bottom seal for high debris environments.

• Manual, electric or hydraulic actuation.

• Also available: A-250 Series Aluminum Slide Gates

FABRICATED STAINLESS STEEL GATES ADDITIONAL INFORMATION

NSF 61 / NSF 372:
The SS-250 series water control gates (6" – 120") conform to the requirements of NSF/ANSI 61 Drinking Water System Components – Health Effects and NSF/ANSI 372. They conform with the lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

Range of Sizes:
Waterman offers in-stock gates in standard dimensions for quick delivery and lowest total cost. In addition, we can custom design and manufacture gates in a nearly unlimited range of sizes and configurations.

Non-Rising Stem:
Fabricated gates can be ordered with a non-rising stem for areas with restricted space above the gate operator. The disadvantage of a non-rising stem is the threaded operating nut and stem are always exposed in the gate well. Lubrication of the threads becomes difficult to maintain and can lead to premature wear.

Optional Wall Thimbles:
Waterman can supply wall thimbles for mounting of fabricated gates. A thimble can be requested to ship prior to the gate so that it can be included in concrete forms before the structure is poured. Use of a thimble dramatically reduces the time for installation by eliminating labor of placing and aligning anchor bolts and the potential for misplaced or misaligned anchors. With a properly-installed thimble, the gate can be installed quickly when it arrives on site. See page 19 for a complete range of configurations.

Tandem Lifts / Interconnected Actuators:
For large gates, tandem actuators can be specified. This configuration is often used for gates over 72" width.

Actuator Loads for Structures:
For standard gates that are not self-contained, opening and closing thrusts from the actuator are resisted by the structure. Consult with Waterman's engineering department for appropriate design parameters.

Actuators:
Waterman gates can be supplied with manual, electric or hydraulic actuators.

Manual actuators are typically geared "crank type" lifts, although handwheel-type actuators can be applied on small-sized gates with low operating loads. In situations where it will take substantial manual effort / time to open a gate, Waterman can supply electric or gasoline-powered portable operators. Consult with Waterman's engineering department for specifications.

Electric actuators provide convenience for frequent opening, faster opening speeds and readily lend themselves to automation.

Hydraulic cylinders are frequently used in repetitive cycling applications and where automatic gate opening / closing in the event of a power failure is desired.

AWWA FABRICATED SLIDE GATE PART NUMBERING GUIDE

PART NUMBER ORDERING GUIDE

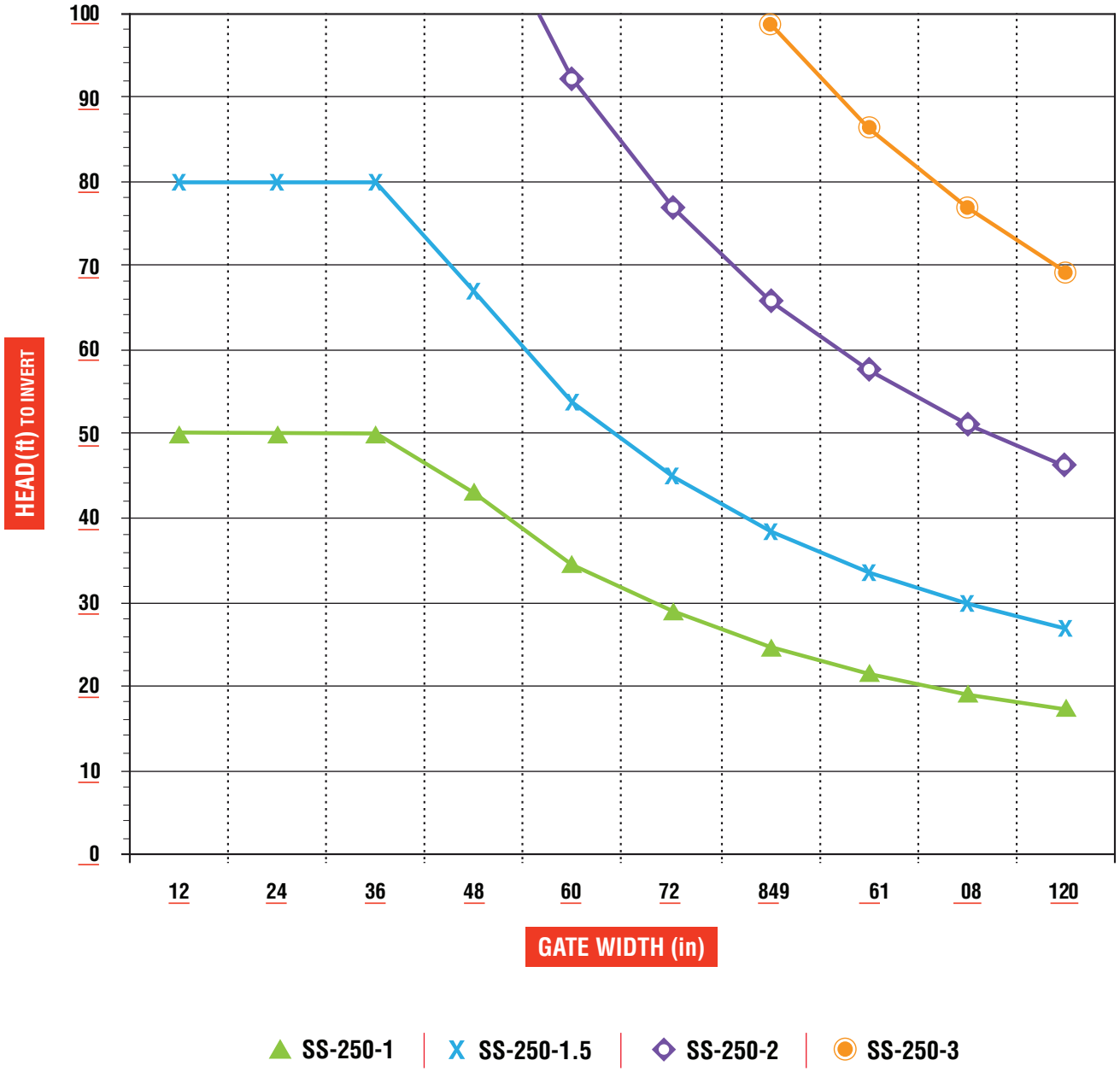
SS – 25 1 – 1 – Y – 36 x 42 10

Material	Opening Configuration Type	Series	Options	Dimensions W x H	Head Rating
A-25 = Aluminum **SS-25** = Stainless Steel	**1** = Standard **2** = Downward Opening **3** = Upward Opening **4** = Weir **5** = End of Channel Non Restricted Flow **6** = Embedded Guide **7** = Wall Mount	Indicate 1, 1.5, 2, or 3	Indicate **F** = Flanged **CF** = Circular Flange Modified ANSI 125# drilling **LF** = Fully Contained Slide **Y** = Self Contained Gate **N** = Non-Rising Stem Cover **X** = Special or Modified Option **Q** = Flush Bottom Seal **T** = Mounted to Wall Thimble	(separate with X), if metric, indicate MM after each number for millimeters	indicate head rating in 5' increment

SS-251-1-Y-36 x 42-10

Indicates a stainless slide gate, standard series, self-contained, with 36" W x 42" H, rated for 10 feet of head.

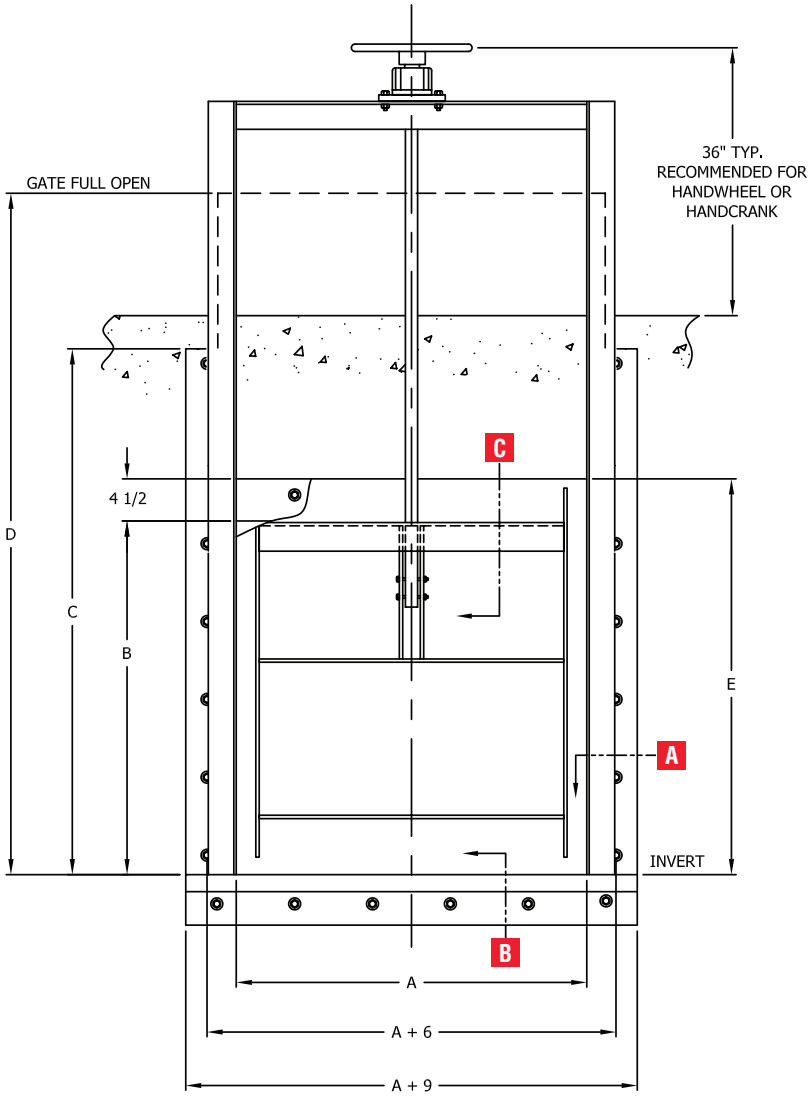
STAINLESS STEEL GATE SERIES
HEAD RATINGS FOR CUSTOM SIZES



Drawings shown in this booklet are for 250-1 models only. Request drawings and specs for other models.

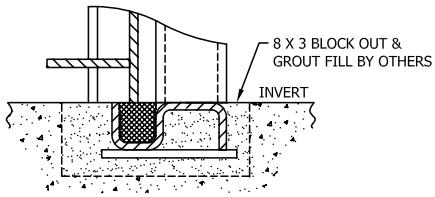
NOTES:
1) Formula to determine seat pressure:
Gate width (in)* Head (ft)*.2166

SS-251-1 SLIDE GATE



A Gate Opening Width
B Gate Opening Height
C Guide Rail Height = B + 1/2 of Slide
D Gate Full Open = 2B + 4-1/2
E Slide Height = B + 4-1/2

ALTERNATE "Q" BOTTOM



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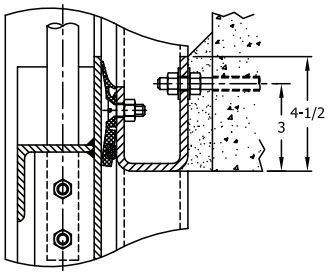

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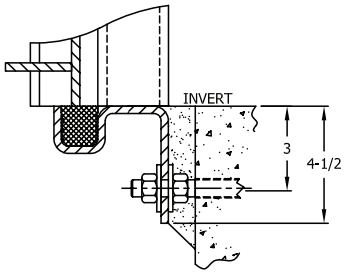

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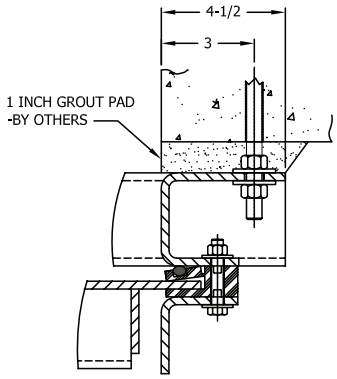
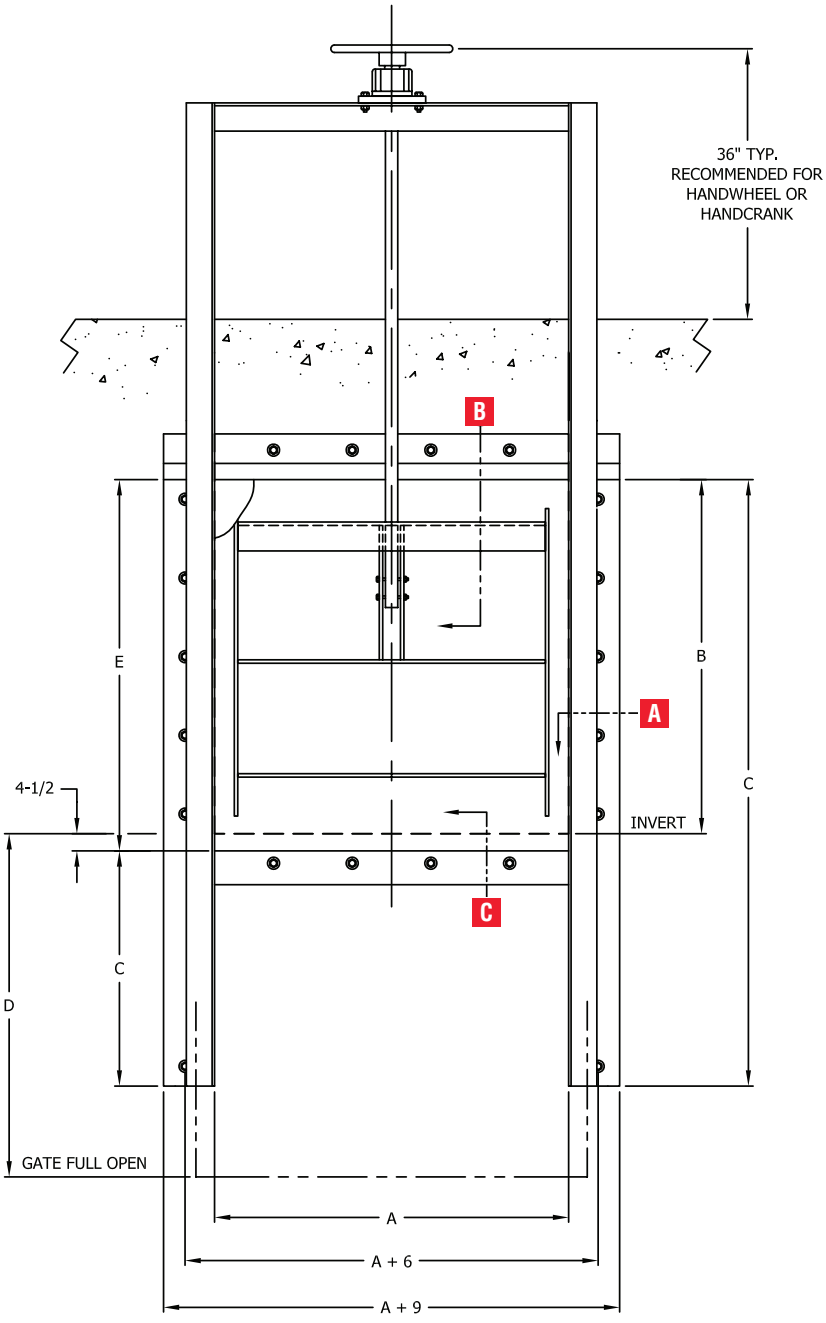


SS-252-1 SLIDE GATE



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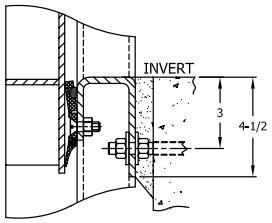

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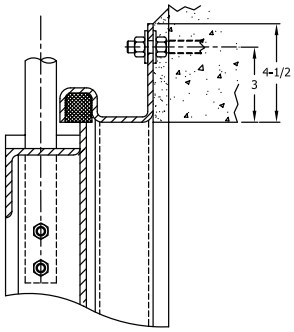

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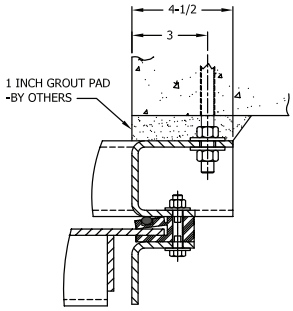
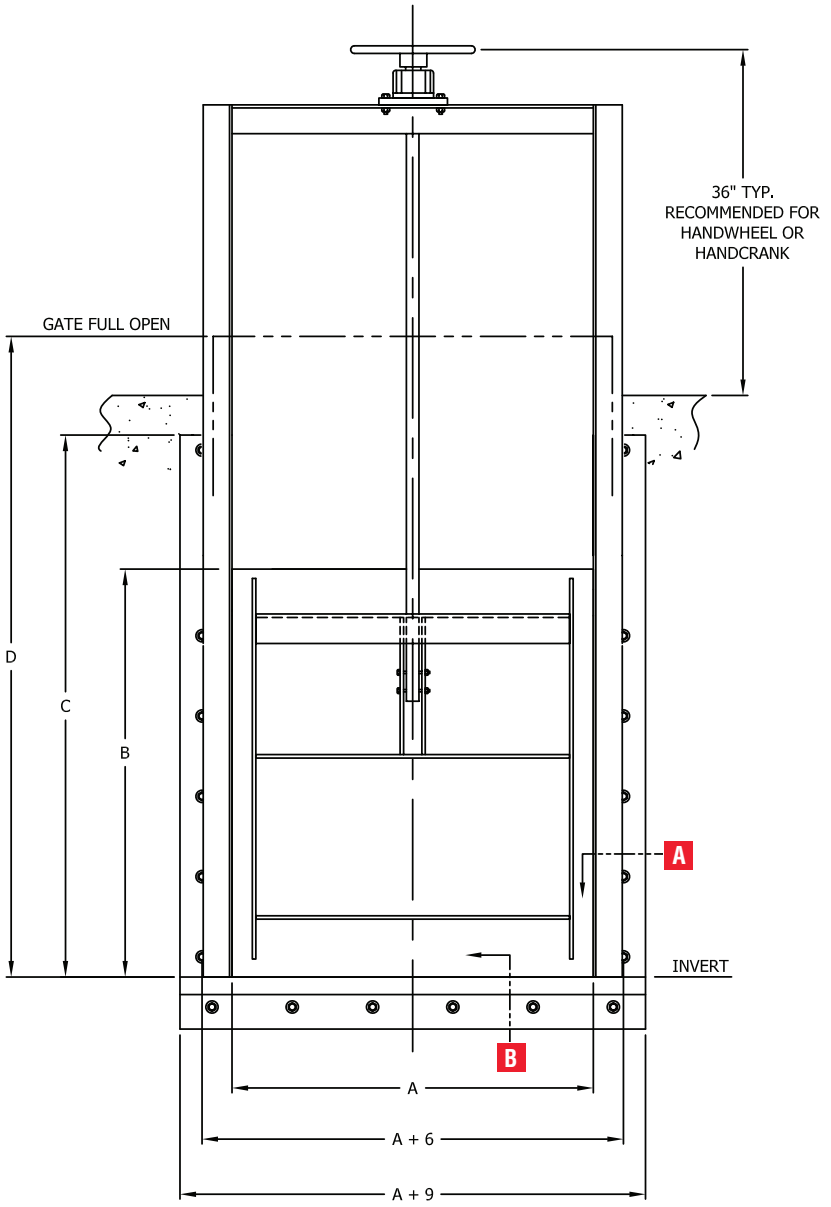
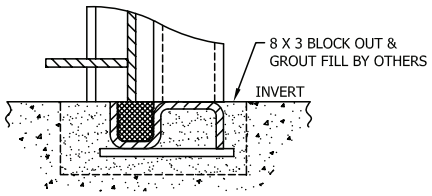


- A Gate Opening Width
- B Gate Opening Height
- C Guide Rail Height = B + 1/2 of Slide
- D Gate Full Open = B + 4-1/2
- E Slide Height = B + 4-1/2

SS-253-1 SLIDE GATE



ALTERNATE "Q" BOTTOM



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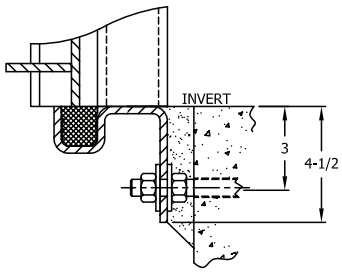

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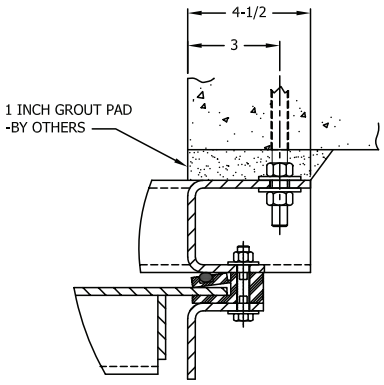
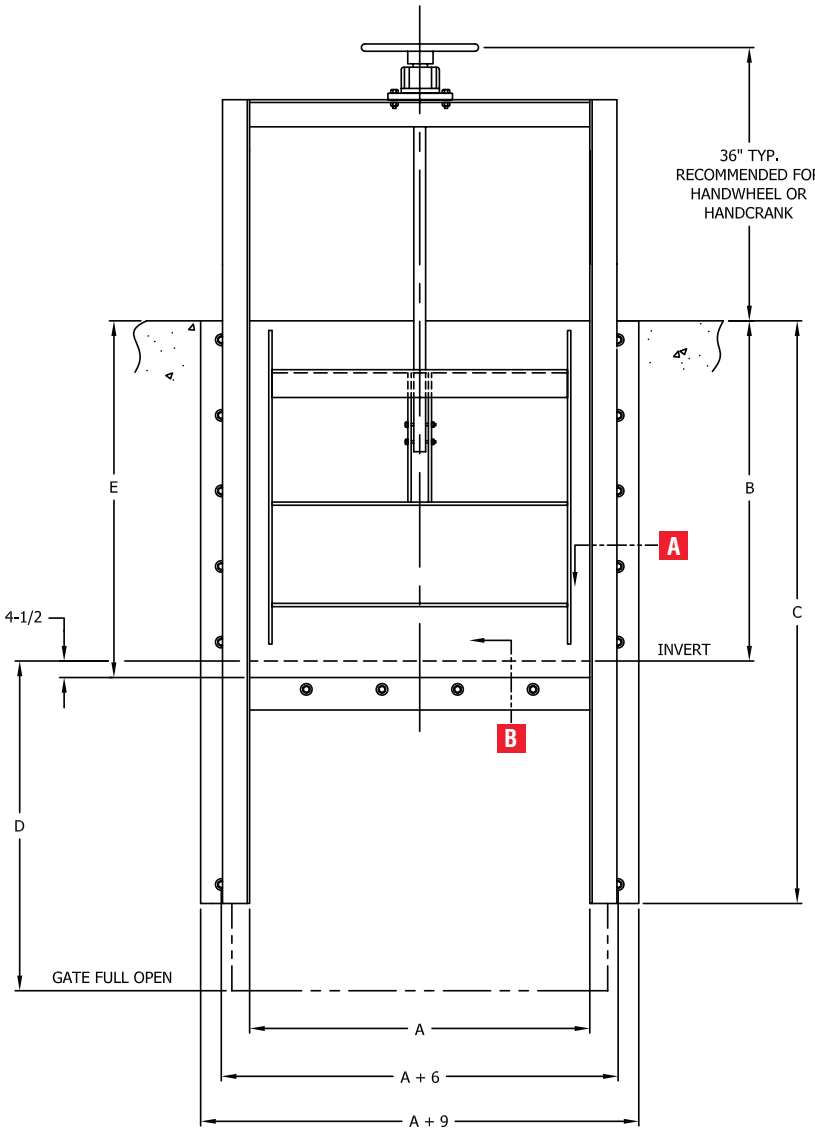


A Gate Opening Width
B Gate Opening Height
C Guide Rail Height = B + 1/2 of Slide
D Gate Full Open = 2B
E Slide Height = B

SS-254-1 SLIDE GATE



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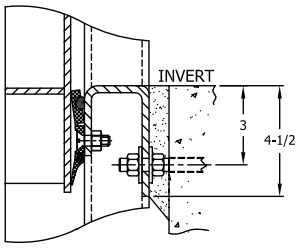

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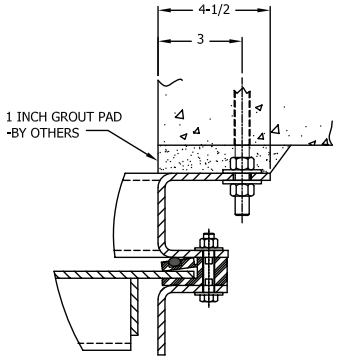
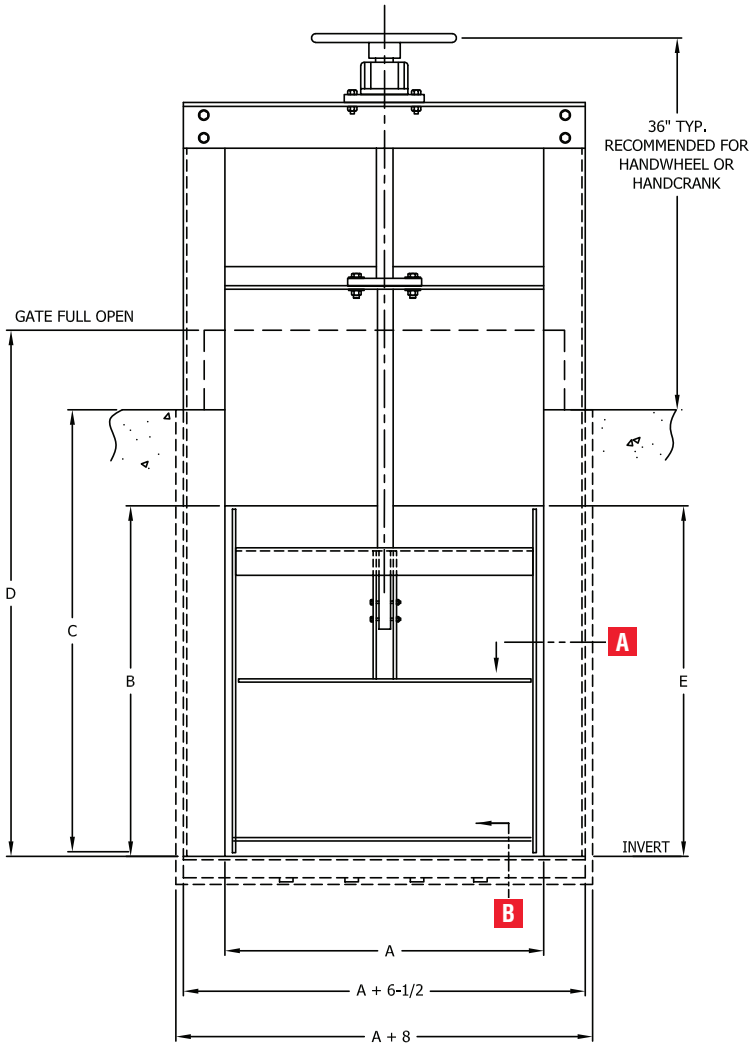


A Gate Opening Width
B Gate Opening Height
C Guide Rail Height = B + 1/2 of Slide
D Gate Full Open = B + 4-1/2
E Slide Height = B + 4-1/2

QSS-256-1 SLIDE GATE



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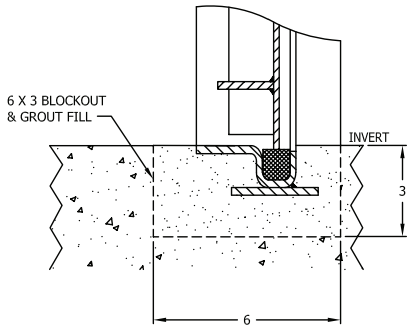

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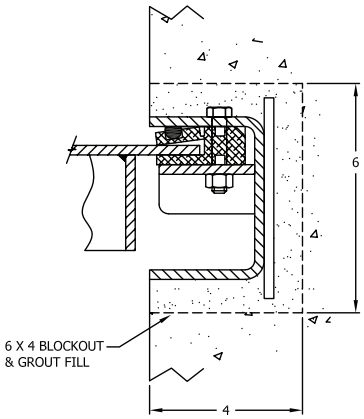
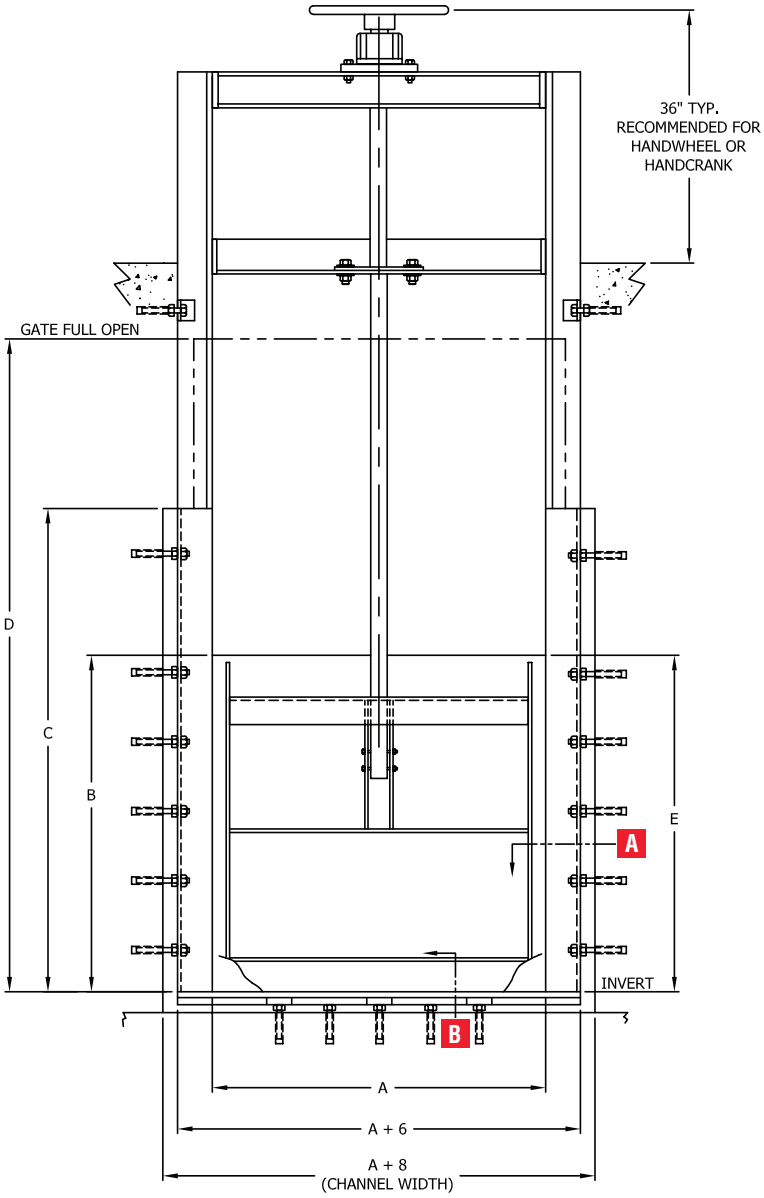


A Gate Opening Width
B Gate Opening Height
C Guide Rail Height = B + 1/2 of Slide
D Gate Full Open = 2B
E Slide Height = B

SS-257-1 SLIDE GATE



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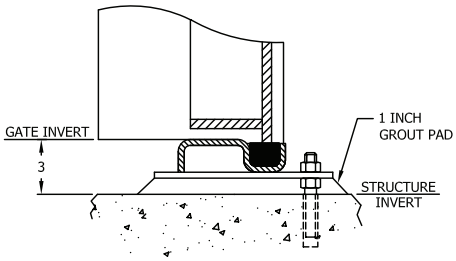
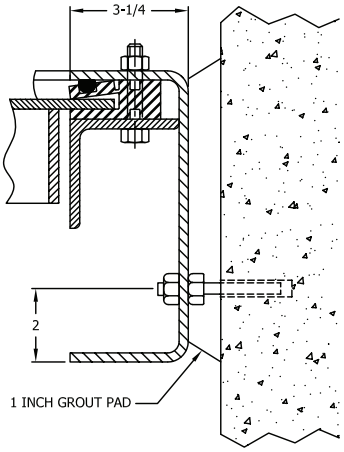
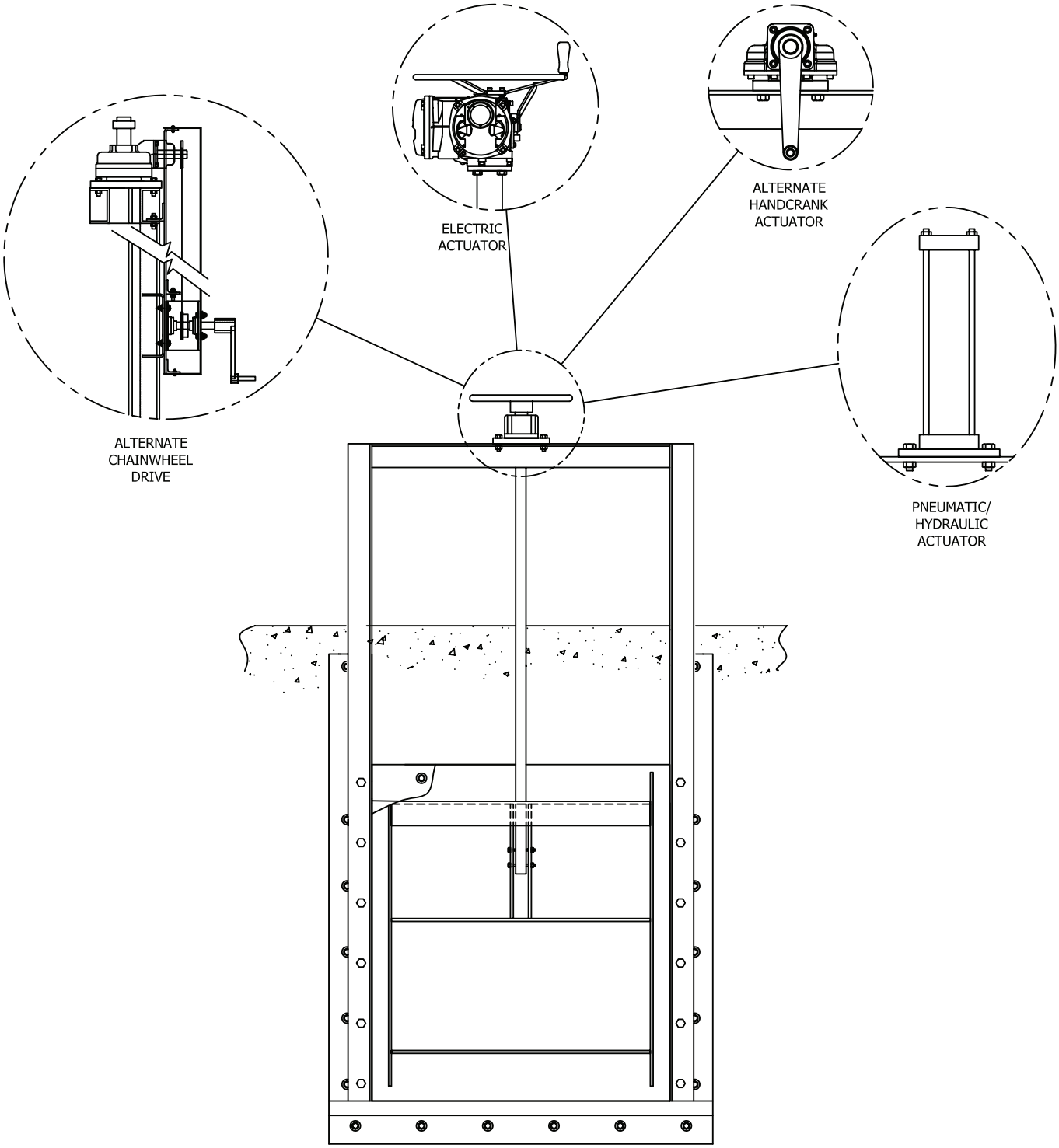


SECTION A



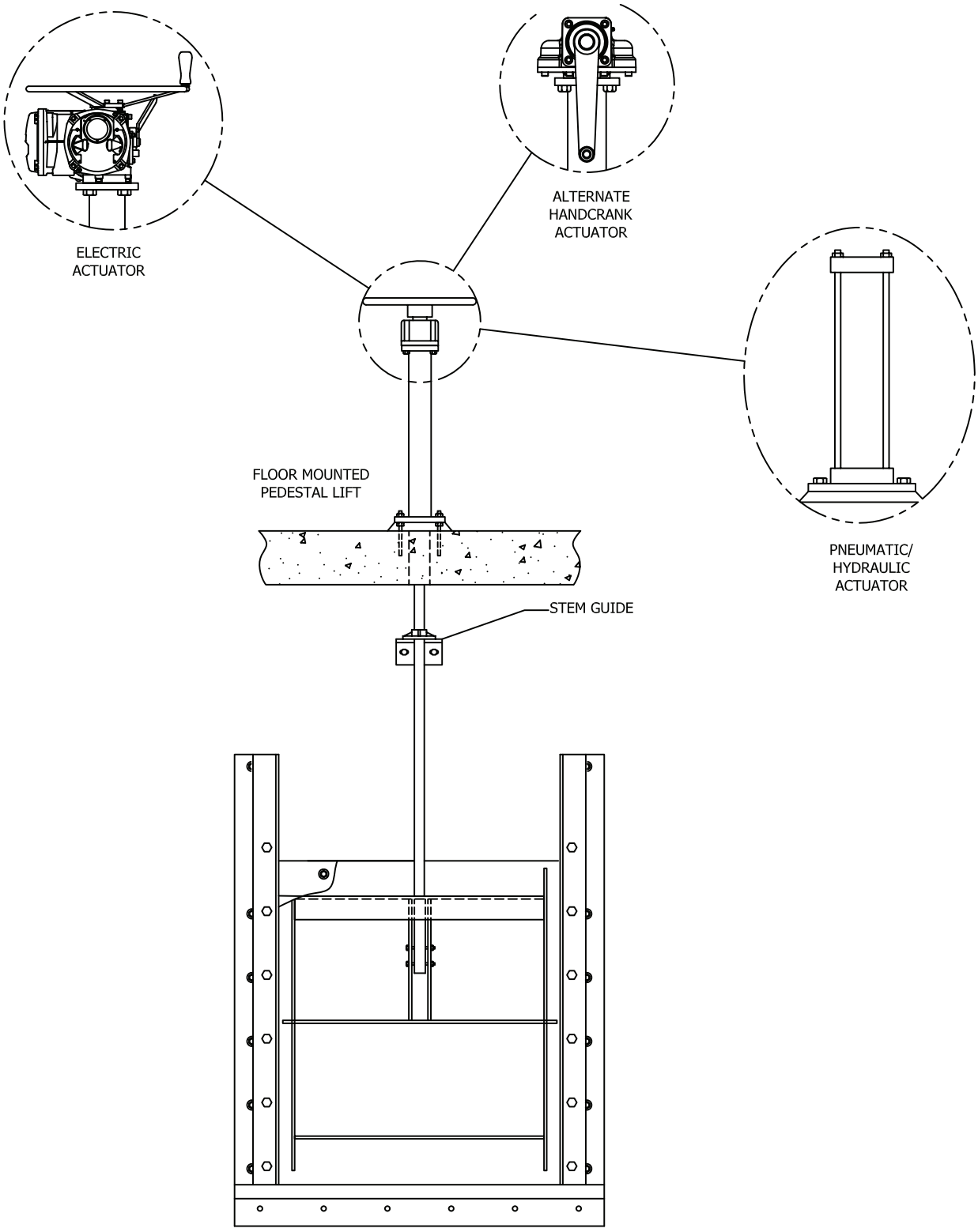
A Gate Opening Width
B Gate Opening Height
C Guide Rail Height = B + 1/2 of Slide
D Gate Full Open = 2B
E Slide Height = B

ACTUATORS SELF CONTAINED SLIDE GATES



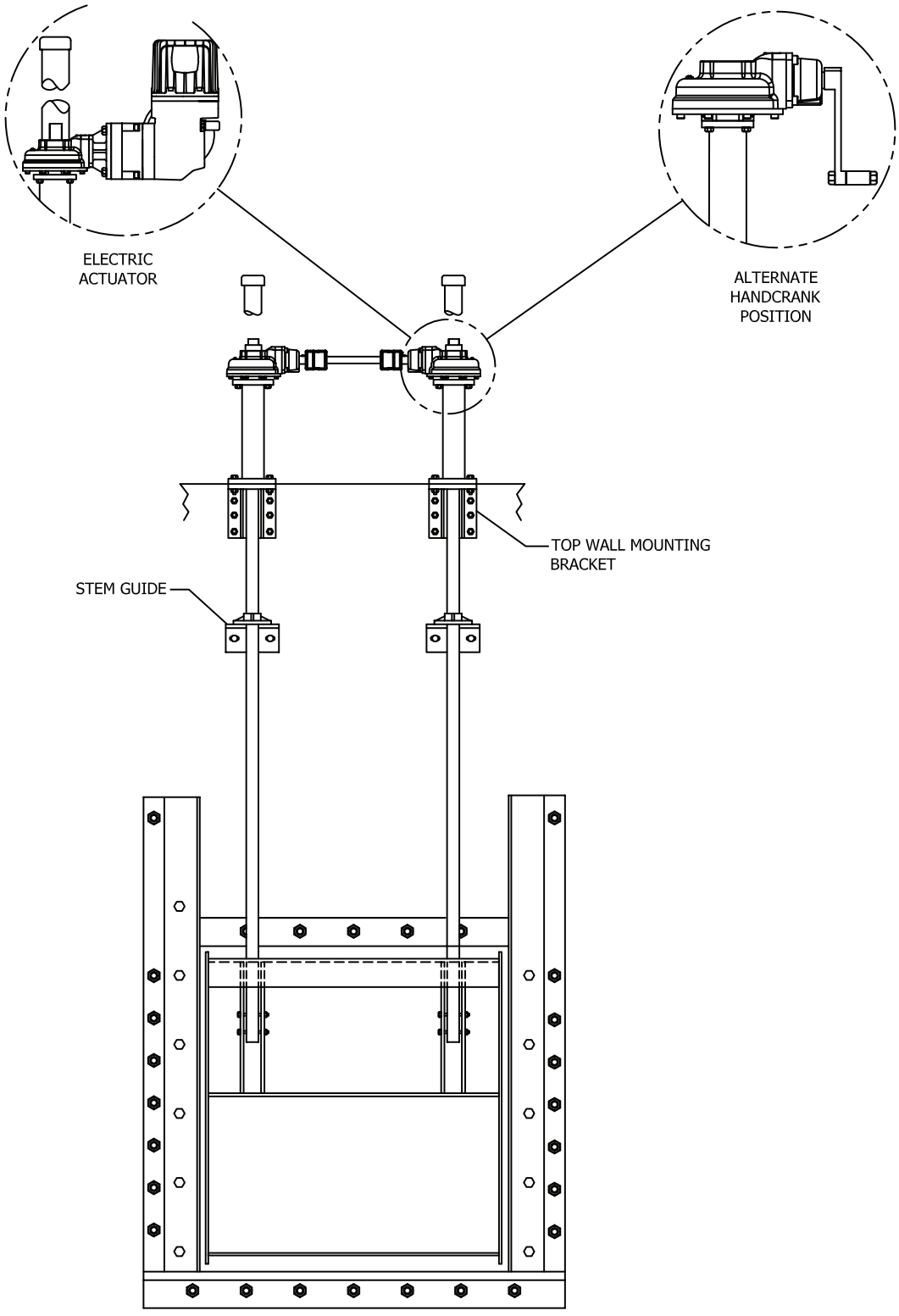
SINGLE LIFT & STEM

ACTUATORS FOR NON-SELF CONTAINED SLIDE GATES



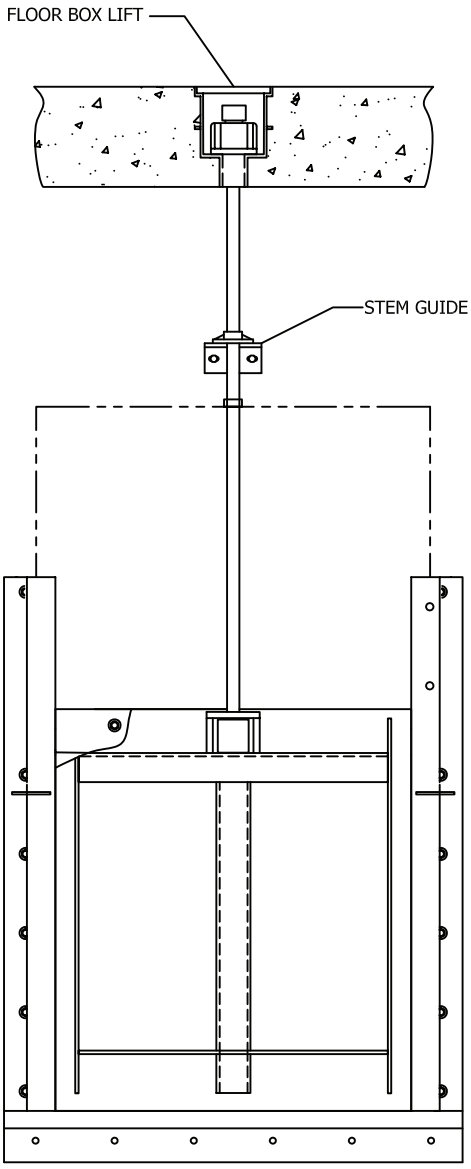
SINGLE LIFT & STEM

ACTUATORS NON-SELF CONTAINED SLIDE GATES

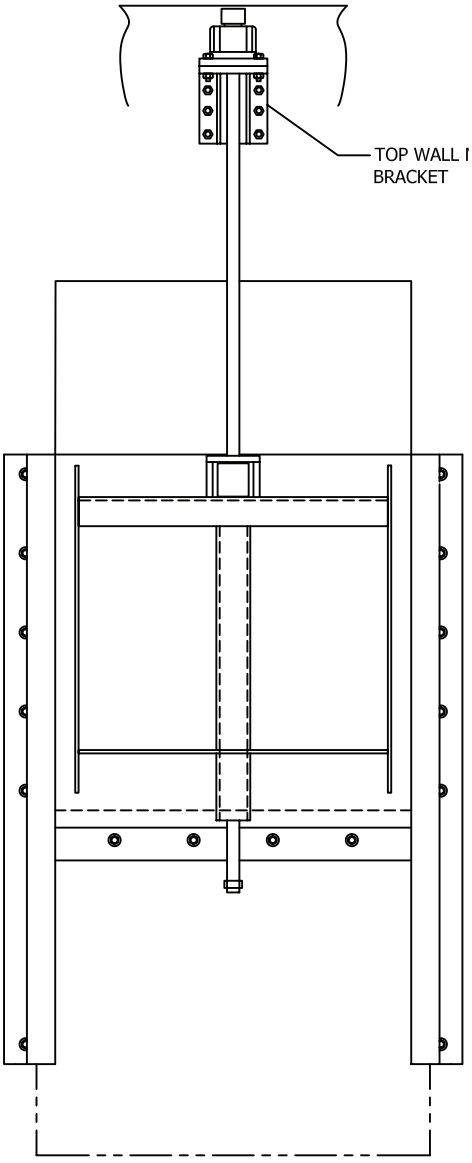


TANDEM LIFTS WITH DUAL STEMS

NON RISING STEM NON-SELF CONTAINED SLIDE GATES

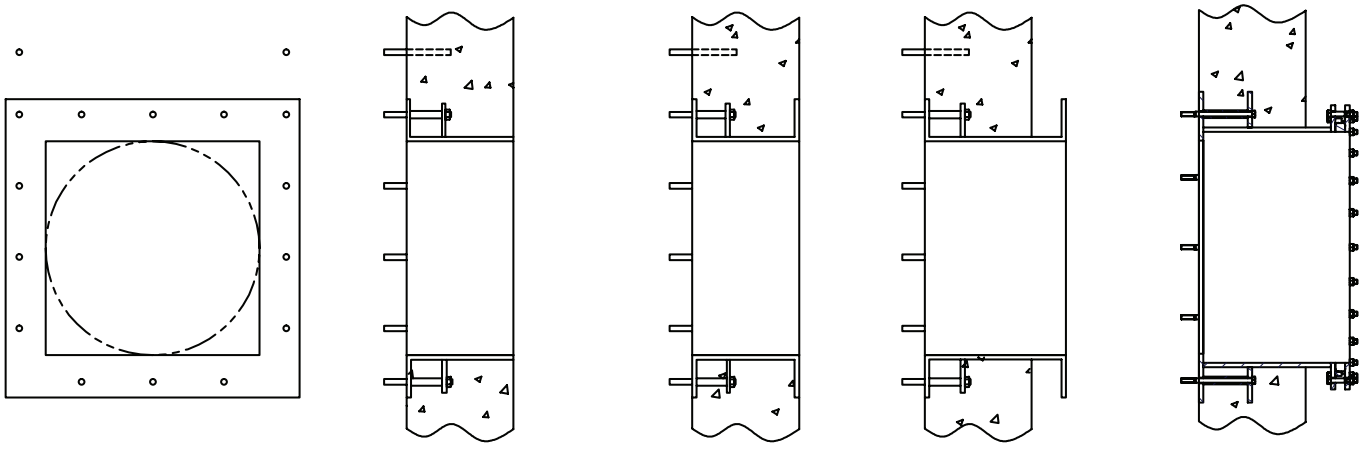


NON-RISING STEM SLIDE GATE



NON-RISING STEM SLIDE (WEIR) GATE

MOUNTING OPTIONS



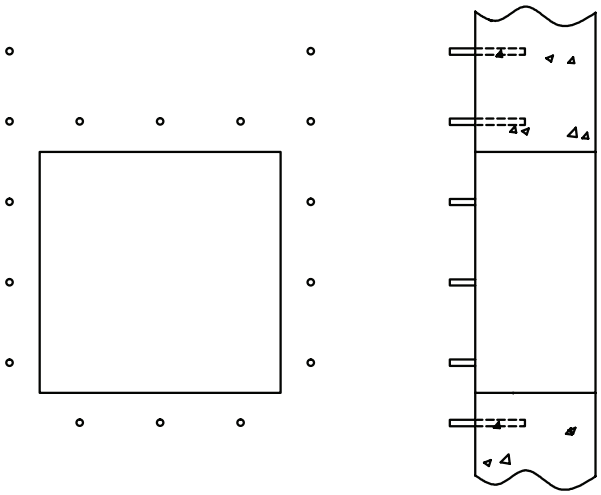
'F' TYPE

'E' TYPE

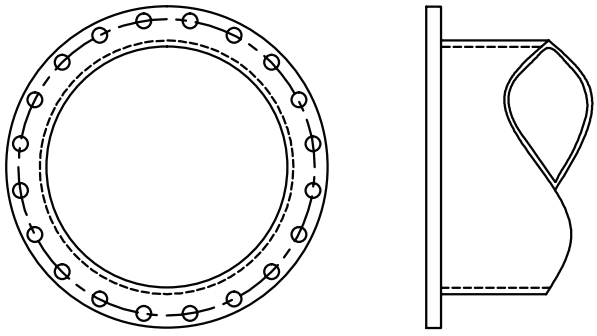
'MJ' TYPE

WALL THIMBLES

AVAILABLE WITH SQUARE, RECTANGLE OR CIRCULAR OPENING



ANCHOR BOLT MOUNTING



PIPE FLANGE MOUNTING

SECTION_____

TYPICAL SPECIFICATIONS FOR SS-250 SERIES FABRICATED SLIDE GATE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The equipment provided under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specification, engineering data, instructions and recommendations of the equipment manufacturer unless expectations are noted by the engineer.

Gates and operators shall be supplied with all the necessary parts and accessories indicated on the drawings, specified or otherwise required for a complete and properly operating installation, and shall be the latest standard product of a manufacturer regularly engaged in the production of fabricated water control gates.

B. Unit Responsibility: To ensure compatibility of all components directly related to the slide gates, unit responsibility for the slide gates, actuators and accessories as described in this section shall be the responsibility of the slide gate manufacturer unless specified otherwise.

1.02 SUBMITTALS

A. Submittals shall be in accordance with Sections_____ and as specified herein.
Submittals shall include as a minimum:

1. Shop drawings
2. Manufacturer's operation and maintenance manuals and information
3. Manufacturer's installation certificate
4. Manufacturer's equipment warranty
5. Manufacturer's affidavit of compliance in accordance with Section _____

1.03 QUALITY ASSURANCE

A. Qualifications

1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20-years of experience designing and manufacturing slide gates. The manufacturer shall have manufactured stainless steel slide gates of the type described here in for a minimum of 20 similar projects.
2. The sealing system shall be certified and tested for operation and performance to leakage specifications compliant with AWWA C-561 for a minimum for 100,000 cycles.
3. The project design is based on the Waterman SS-250 Series Fabricated Slide Gates as manufactured by Waterman Valve of Exeter, California. Proposed alternatives must be pre-approved, per addendum, at least 14-days prior to close of bid. Requests for alternatives must be supplemented with detailed drawings, specifications, and references. Any/all additional costs for structure modifications or other changes associated with utilizing a brand other than Waterman are to be borne by the contractor.
4. To insure quality and consistency, the slide gates listed in this section shall be manufactured and assembled in a facility owned and operated by the slide gate manufacturer. Third-party manufacturers contracted for fabrication and assembly of the slide gates will not permitted.

PART 2 EQUIPMENT

2.01 GENERAL

A. The gates shall be either self-contained with yoke and bench stand operations, or non-self contained with separate stem guided and operator, in accordance with the requirements of these specifications

B. The gates shall be compliant with the latest version of AWWA C561, as described below.

C. Specific configurations shall be as noted on the gate schedule or as shown on the plans

D. Materials:

COMPONENTS	MATERIALS
FRAME, YOKE, COVER SLIDE, WALL THIMBLES	Stainless Steel ASTM A240, Type 304L Stainless Steel ASTM A240, Type 316L Stainless Steel ASTM A240, Type 2205 Duplex
SEAT/SEALS & STEM SLEEVES	Ultra-High-Molecular-Weight Polyethylene (UHWMPE) ASTM D4020
CORD SEAL	Neoprene ASTM D2000 Nitrile ASTM D2000 Viton ASTM D1418
FLUSH BOTTOM SEALS	Neoprene ASTM D2000 Viton ASTM D1418
STEMS	Stainless Steel ASTM A276, AISI Type 304 Stainless Steel ASTM A276, AISI Type 316 Stainless Steel ASTM A276, AISI Type 2205 Duplex Stainless Steel ASTM A564, AISI Type 630
STEM COVER	Clear Butyrate with Mylar Strip Galvanized A53 Steel Aluminum
STEM GUIDES	Cast Iron (ASTM 126 Class B) Bronze Bushed Cast Iron (with 2% Nickel) Bronze Bushed Ni-Resist Cast Iron (ASTM A436, Type 2 or 2B) Bronze Bushed Stainless Steel (ASTM A240 Type 304L) UHMW Bushed Stainless Steel (ASTM A240 Type 316L) UHMW Bushed Stainless Steel (ASTM A240 Type 2205) UHMW Bushed
WALL BRACKETS	Not Applicable Cast Iron (ASTM 126 Class B) Cast Iron (with 2% Nickel) Ductile Cast Iron (ASTM A536) Ni-Resist Cast Iron (ASTM A436, Type 2 or 2B) Steel (ASTM A36) Stainless Steel ASTM A240, AISI Type 304L Stainless Steel ASTM A240, AISI Type 316L Stainless Steel ASTM A240, AISI Type 2205
PEDESTALS	Not Applicable Cast Iron (ASTM 126 Class B) Cast Iron (with 2% Nickel) Ductile Cast Iron (ASTM A536) Ni-Resist Cast Iron (ASTM A436, Type 2 or 2B) Steel (ASTM A36/A53) Stainless Steel ASTM A240/A312, AISI Type 304L Stainless Steel ASTM A240/A312, AISI Type 316L Stainless Steel ASTM A240/A312, AISI Type 2205
FASTENERS AND ANCHOR BOLTS	Stainless Steel ASTM A593 & A594, Type 304 CW A193 & A194 Stainless Steel ASTM A593 & A594, Type 316 CW A193 & A194 Stainless Steel ASTM A593 & A594, Type UNS S-32205 Duplex 2205
FINISH	Polyamide Epoxy Coal Tar Epoxy

E. GATE SCHEDULE

EQUIPMENT NUMBER	GATE SIZE, INCH[1]	GATE TYPE[2]	OPENING DIRECTION[3]	BOTTOM SEATING[4]	DESIGN HEAD, FEET		OPERATOR TYPE
					SEATING	UNSEATING	

Notes: Clear opening width by height. E = embedded frame, W = wall mounted, Y = self-contained, F = flatback U = upward, D = downward FB = flush bottom

2.02 FRAME AND GUIDE RAILS

A. The gate frame shall be composed of stainless guide rails with UHMW seat/seals upstream and downstream. The seat/seals shall form a tight seal between the frame and the slide (disc). The guides will be of sufficient length to support 1/2 the height of the slide when in the full open position.

B. Yoke shall not deflect more than 1/360th of the span under full head break load.

C. Seals shall be replaceable without removing the frame from the wall. In the case of embedded gates, they shall be constructed in a manner that allows replacement of the seals with out removal of the gate frame for the embedment.

2.03 STEM AND STEM GUIDE

A. Material

1. The stem shall be solid stainless steel of the specified grade.

B. Design

1. Guides shall be adjustable with split stem sleeves. Guides shall be spaced per manufacture's recommendations. The stem L/r ratio shall not exceed 200.
2. Stem threads shall be machine cut 29 degree full Acme or stub Acme type.
3. Nominal diameter of the stem shall not be less than the crest of the treaded position.

2.04 SEALS

A. The seals shall be self-adjusting. Seals requiring periodic maintenance and adjustments to maintain specified leakage rates will not be permitted.

B. The top seal design on upward opening gates consisting of four side seals shall incorporate a self-cleaning wiping function that prevents debris from building-up above the top seal and causing premature wear of the seats, seals and gate face.

C. The UHMW seats shall impinge on the slide (disc) by way of a continuous loop cord seal. Seal designs incorporating resilient seals such as "J-bulb" or "P" seals that come in direct contact with the friction surface of the slide will not be considered.

D. The cord seal shall function as a seal between the frame and the UHMW, and as a spring force to maintain contact between the UHMW and the slide (disc).

E. The resilient bottom seals shall be set into the invert member of the frame which shall be formed in a manor to protect 3 sides of the seal only exposing the side that will come in contact with the slide. Disc-mounted invert seals exposing additional surface area will not be permitted.

F. The self-adjusting seal system shall provide an allowable leakage rate of no more 0.05 gpm per peripheral foot of perimeter opening for seating and unseating heads.

2.05 SLIDE COVER (DISC)

A. The slide cover (disc) shall be stainless steel plate reinforced with structural shapes welded to the plate
    1. The slide cover shall not deflect more than 1/720th of the span, or 1/16" at the seated sealing surface of the gate under maximum specified head.
    2. The stem to gate connection shall be either the clevis type, with structural members welded to the slide and a bolt or bolts to act as a securing method, or a threaded and bolted (or keyed) thrust nut supported in a welded nut pocket.
    3. The clevis, or pocket and yoke, of the gate shall he capable of taking , without damage, at least twice the rated thrust output of the operator at 40 pounds of pull on a hand wheel or hand crank, and at lcoked-rotor stall of a motor operator.
    4. The slide cover shall be constructed with vertical and horizontal reinforcement ribs.
    5. All welds shall be performed by an AWS-certified welding technician.

2.06 ANCHOR BOLTS

A. Anchor hardware shall be provided by the slide gate manufacturer.
    1. The size, quantity, and location of the anchor hardware shall be engineered by the slide gate manufacturer.
    2. Anchor hardware consisting of studs, nuts and washers shall be provided by the manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation of the gates shall be performed in accordance with standard industry practices. It shall be the responsibility of the CONTRACTOR to handle, store, and install the equipment specified in this SECTION in strict accordance wit the manufacturers recommendations.
B. The CONTRACTOR shall review the installation drawings and installation instructions prior to installing the gates.
C. The gate frames shall be installed in a true vertical plane, square and plumb, with no twist, convergence, or divergence between the vertical legs of the guide frame.
D. The CONTRACTOR shall fill any void between the guide frames and the stricture with non-shrink grout as shown on the installation drawing and in accordance with the grout manufacturers recommendations.
E. The frame cross rail shall be adjusted as required to maintain consistent seal compression across the full width of the gate.

3.02 FIELD TESTING

A. After installation, all gates will be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. Each gate assembly shall be water tested by the CONTRACTOR at the discretion of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowed leakage.

WATERMAN, PART OF MCWANE PLANT & INDUSTRIAL

For over 100 years, Waterman has been a leading supplier of gates, valves and specialty components for the water treatment, water delivery, industrial processing and agricultural irrigation markets. With an expanded offering, faster delivery and superior support, MPIs Waterman brand is ready to help with your project needs.

WATERMAN + MPI = FORWARD-THINKING PRODUCTS AND SUPPORT

Waterman is part of McWane Plant & Industrial (MPI), a single-source manufacturer for valves, gates, pipe and fittings for a total solution for your project. With the combined strength of the industry's top brands: Kennedy Valve, McWane Ductile, Tyler Union and Waterman, MPI offers unmatched portfolio of dependable and forward-thinking solutions. Most importantly, MPI's team of veteran industry experts are ready to listen to your needs and to support you at every phase of your project from design through to start up.

WATERMAN OFFERS BOTH IN-STOCK & CUSTOM-ENGINEERED SOLUTIONS

Waterman offers both standard "in-stock" products as well as fully custom-engineered solutions. Waterman custom solutions incorporate market leading designs: slide gates, sluice gates, radial (tainter) gates, automatic siphons, automatic level control gates, stop gates, stop logs, roller gates, tilting weir gates and more. All Waterman products are engineered for high performance and built-to-last, so you can be confident in your system's performance for decades to come.

WATERMAN OFFERS LARGEST USA-BASED MANUFACTURING CAPABILITIES, TWO PLANTS

Founded in Exeter, California in 1912, Waterman is a brand built on quality and confidence. Waterman engineers, fabricates and tests its products in company-owned USA-based facilities. The principal manufacturing facility opened in Exeter in 1963. A second manufacturing facility in Calera, Alabama was added in 2020 to serve the Eastern United States and to provide additional capabilities for large and complex water control gates.

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VBG SERIES RECTANGULAR BUTTERFLY VALVES

Waterman rectangular rubber-seated butterfly valves are designed for water-tight closure, convenient installation and operation, and adaptability to a variety of uses. They are available in four-sided seating models for orifice or in-line mounting and in three-sided channel mounted units. Each gate is designed and fabricated for its specific installation and function requirements.

APPLICATIONS & ADVANTAGES

Rectangular valves are commonly used where low headroom prevents the use of conventional sluicegates, and where flow regulating (modulating) is a requirement.
Other advantages include watertight performance in either direction (both seating and unseating heads), the acceptance of maximum heads of water on either side, and the ease of operation. Applications include sewage treatment plants, water filtration projects, cooling tower basins, power plants, and many other water and flood control projects.

APPROVED FOR USE IN DRINKING WATER SYSTEMS

The VBG series water control gates (24"–72") conform to the requirements of NSF/ANSI 61 Drinking Water System Components – Health Effects and NSF/ANSI 372. They conform with the lead content requirements for “lead free” plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

SIZES

Square sizes currently available are 24" x 24" through 72" x 72". Larger and/or special sizes can be designed and fabricated to meet particular project requirements.

DISC DESIGN

The disc (vane) features an adjustable resilient seal with stainless steel fasteners and retaining bars. Made of Neoprene rubber, the seals seat against frame-mounted stainless steel seats for a positive, no-leak performance. Adjustments and field replacement are easily accomplished.

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VBG SERIES RECTANGULAR BUTTERFLY VALVES

The streamline design of the disc minimizes turbulence in the full open position, lessens pressure drop across the valve in the open position, and provides excellent throttling characteristics.

VALVE BODY AND SHAFT

Standard valve bodies are fabricated from A-36 mild steel or stainless steel with flanges one side or two, as required for installation, and have a stainless-steel seat. The stainless steel valve shaft is secured to the disc using match-bored taper pins of precipitation hardened stainless steel. Packing glands are stainless steel with impregnated hemp packings. Sleeve bearings are self-lubricating. Thrust bearings are adjustable.

OPERATORS

Waterman rectangular butterfly valves require a 90º turn of the disc to go from full open to full closed. Manual operators with position indicator are available in worm-gear gearboxes with handwheel, or a 2" square operating nut for use with power devices. Electric or hydraulic operators for local and/or remote operation can be provided.

MOUNTING AND OPTIONAL ACCESSORIES

Optional accessories include bonnet extensions, limit switches and integral controls for power operators. Wall thimbles and anchor bolts are available.

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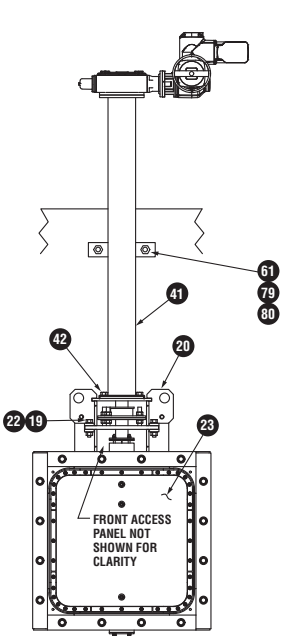
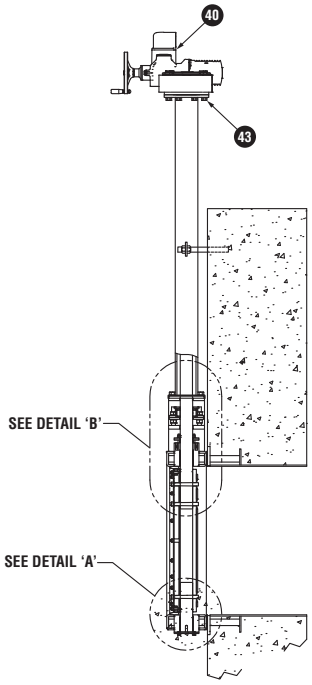
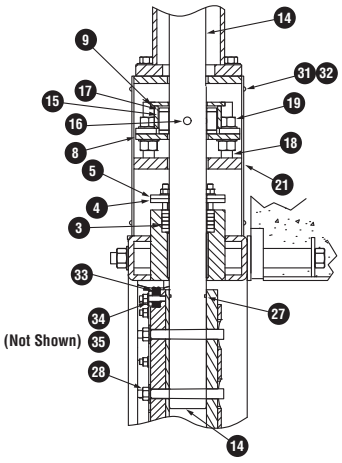
VBG SERIES RECTANGULAR BUTTERFLY VALVES

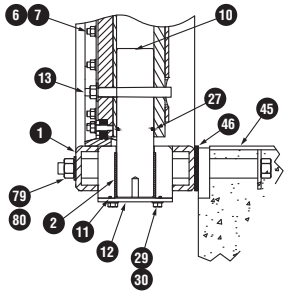
MATERIALS OF CONSTRUCTION







DETAIL 'B'



DETAIL 'A'

MATERIALS OF CONSTRUCTION		
Number	**Description**	**Material**
1	Frame	Standard: Structural Steel ASTM A-513 Optional: Stainless Steel ASTM A-240, Type 304 or 316
2	Bushing	Fiberbacked Teflon
3	Packing Ring	Graphite Impregnated Hemp
4 & 5	Packing Plate	Stainless Steel ASTM A-240 Type 304 or 316
6 & 7	Hardware	Stainless Steel
8	Thrust Plate	Stainless Steel ASTM A-240 Type 304 or 316
9	Thrust Collar	Stainless Steel ASTM A-240 Type 304 or 316
10	Lower Stem	Stainless Steel ASTM A-276 Type 304 or 316
11	O-Ring	Viton ASTM D-2000
12	End Cap	Stainless Steel ASTM A-240 Type 304 or 316
13	Taper Pin	Stainless Steel Bar ASTM A-564 Type 630
14	Upper Stem	Stainless Steel ASTM A-276 Type 304 or 316
15	Thrust Bearing	Stainless Steel ASTM A-276 Type 304 or 316
16	Thrust Bearing Pin	Stainless Steel ASTM A-276 Type 304 or 316
17	Thrust Washer	UHMW Polyethylene ASTM D-6712
18	Stud	Stainless Steel ASTM A-276 Type 304 or 316
19	Hex Nut	Stainless Steel
20	Operator Mount	Standard: Structural Steel ASTM A-513 Optional: Stainless Steel ASTM A-240, Type 304 or 316
21	Access Panel	Stainless Steel ASTM A-240 Type 304 or 316
22	Hex Head Bolt	Stainless Steel
23	Cover Weldment	Standard: Structural Steel ASTM A-513 Optional: Stainless Steel ASTM A-240, Type 304 or 316
27	O-Ring	Viton ASTM D-2000
28 - 32	Hardware	Stainless Steel
33	Seal	Neoprene Rubber ASTM D-2000
34 & 35	Retainer	Stainless Steel ASTM A-240 Type 304 or 316
40	Operator	Brand/Model as Specified
41	Torque Tube Pedestal	Standard: Structural Steel ASTM A-513 Optional: Stainless Steel ASTM A-312, Type 304 or 316
42-43	Hardware	Stainless Steel
46	Gasket	Neoprene Rubber ASTM D-2000
79 & 80	Hardware	Stainless Steel

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VBG SERIES RECTANGULAR BUTTERFLY VALVES

TYPICAL SPECIFICATIONS

Rectangular butterfly valves shall be self-contained and of the rubber seated, tight closing type and capable of seating against the maximum head specified in either direction. Rectangular butterfly valves shall be as manufactured by Waterman Valve, LLC.

VALVE BODIES

Valve bodies shall be rectangular and shall be fabricated from carbon steel conforming to ASTM A-36 (or stainless steel conforming to ASTM A-240, type 304 or 316). The body shall be designed to be field fastened to a wall thimble, directly fastened with anchor bolts to a wall, grouted into a concrete channel, or double flange-mounted in a pipeline. Where a four-sided design is specified, the upper trunnion shall contain a stuffing box utilizing an adjustable bronze gland and low friction hemp packing.

DISC AND SEAT

The valve disc shall be fabricated from ASTM A-36 carbon steel (or stainless steel conforming to ASTM A-240, type 304 or 316) and shall have a resilient seal recessed and clamped with a stainless-steel retaining ring on to its periphery. The valve seal shall be field adjustable and replaceable. The design shall permit removal and replacement in the field without removing the valve disc, shaft, or valve actuator from their mountings. The valve seat shall not be interrupted by the valve shaft. Resilient seals shall be neoprene rubber.
A corrosion resistant metal seat area of stainless steel shall be incorporated in the valve body and corner radii shall not exceed 4½ inches.

SHAFT AND BEARINGS

Valve shafts shall be made of Type 304 (or Type 316) stainless steel. The shaft shall be securely locked to the valve disc by means of stainless-steel keys and bolts, or tapered pins as required. Valve shaft bearings shall be self-lubricated sleeve type fitted into the valve body trunnion bore. The valve assembly shall be furnished with a fixed two-way thrust bearing designed to hold the disc centered in the valve seat at all times.

OPERATOR AND SUPPORT

An extension bonnet of fabricated steel (or stainless steel) shall be provided to locate operator as shown on plans and equally distribute operating torques and loads to structure. Operator shall conform to requirements of valve operation, with sufficient capacity to seat, unseat, and maintain intermediate positions under the operating conditions specified herein.

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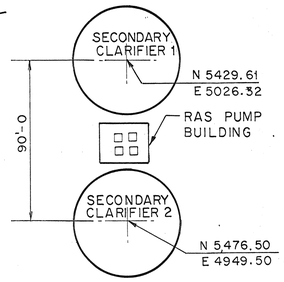
EXHIBIT G

ORIGINAL WASTEWATER TREATMENT PLANT PLANS

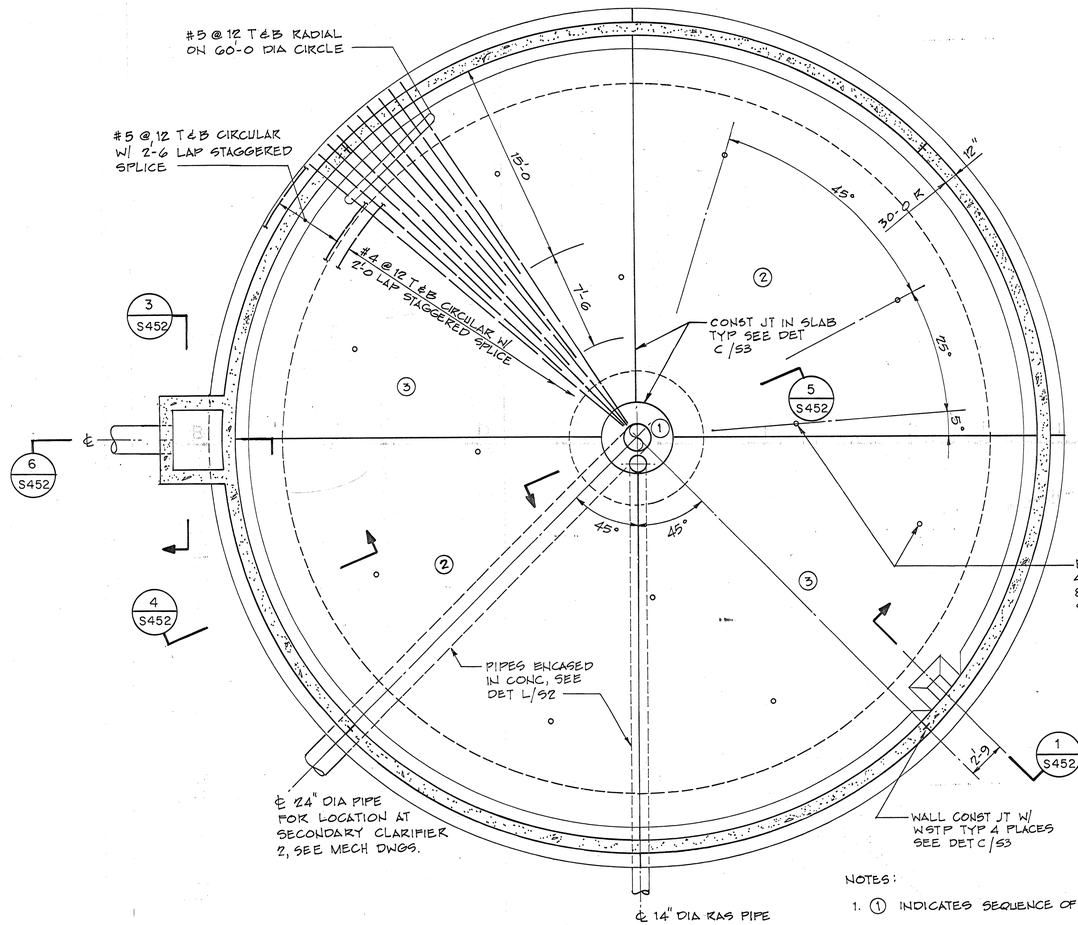
Mammoth Community Water District

Aeration Basin Gates and Diffuser Additions, Concrete Rehabilitation, and Secondary Clarifier Weir Installation and Pipe Replacement

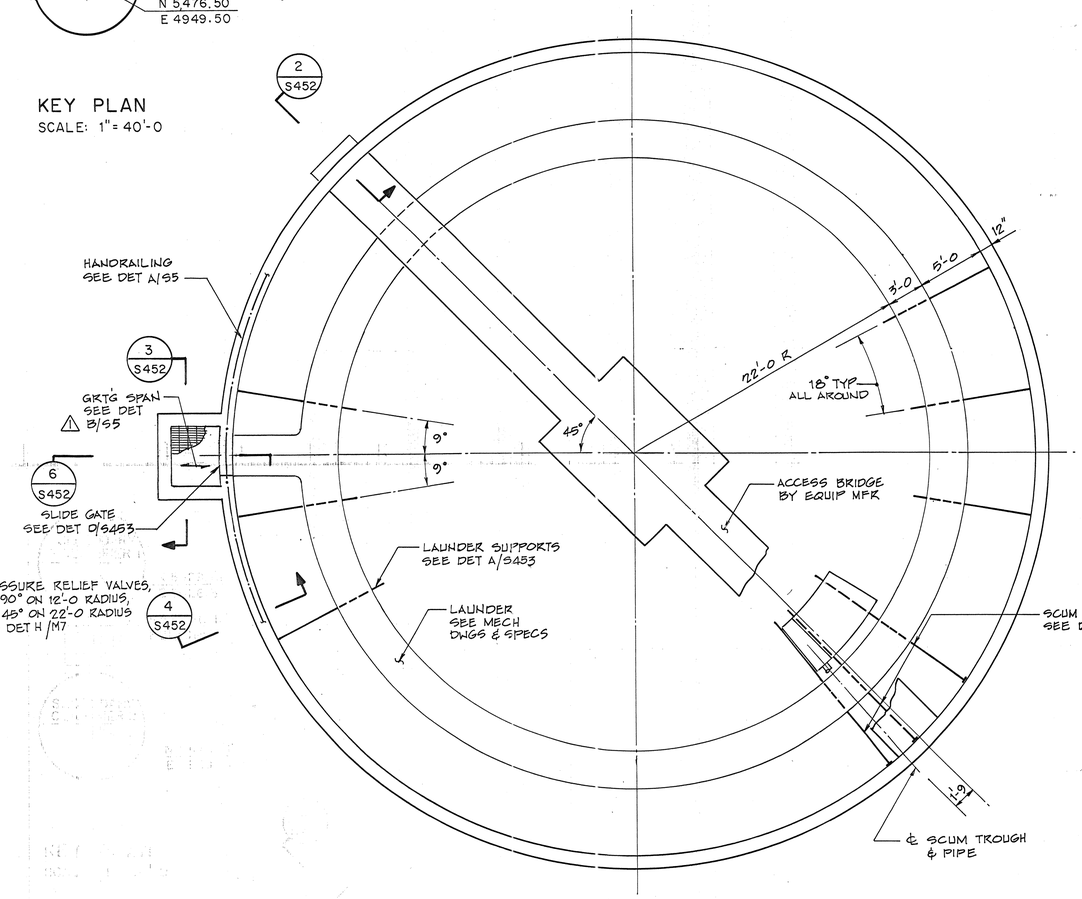
Mammoth Lakes, CA



KEY PLAN
SCALE: 1"= 40'-0



BOTTOM PLAN
SCALE: 3/16"= 1'-0



TOP PLAN
SCALE: 3/16"= 1'-0

NOTES:
1. ① INDICATES SEQUENCE OF CONC POUR.
2. SECONDARY CLARIFIER 1 SHOWN. SECONDARY CLARIFIER 2 SIMILAR. SEE MECH DWGS

RECORD DRAWING
BY _____ DATE 7-9-92
THIS RECORD DRAWING WAS PREPARED USING INFORMATION REPORTED TO BROWN AND CALDWELL AND CONTAINS ONLY THE STANDARD AND CUSTOMARY LEVEL OF DETAIL. THE INFORMATION WAS NOT INDEPENDENTLY FIELD VERIFIED. THERE IS NO ONGOING PROGRAM TO UPDATE THE DRAWINGS TO REFLECT CHANGES SUBSEQUENT TO THE DATE INDICATED. THEREFORE, THIS DRAWING CANNOT BE RELIED UPON AS AN EXACT REPRESENTATION OF ACTUAL CONDITIONS.

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 4-3-90
APPROVED: _____ Brown and Caldwell DATE: 4-30-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN FRP
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — No. C040370 — Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL A. SCHULTE — No. 2251 — Exp. 3-31-93 — STRUCTURAL — STATE OF CALIFORNIA

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	DRAWING CLARIFICATION	DL	11-92	CJK

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

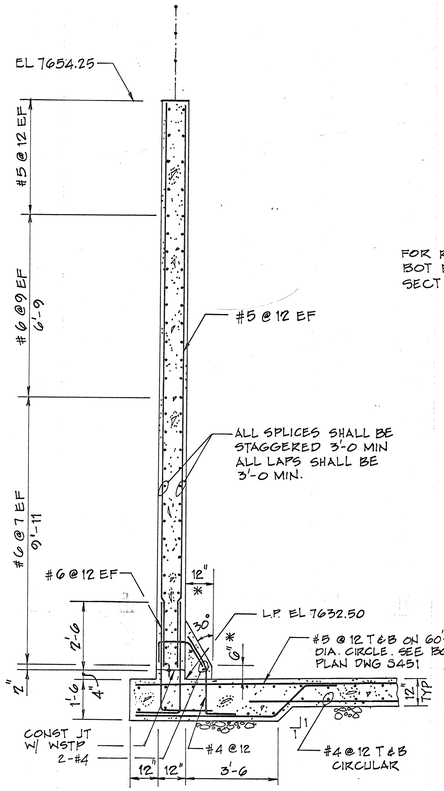
SECONDARY CLARIFIERS 1 & 2

PLANS

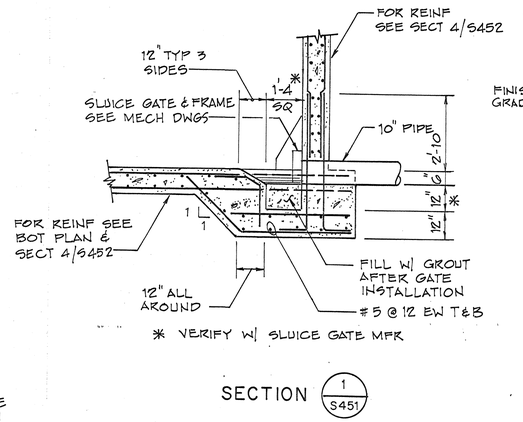
DRAWING NUMBER S451

SHEET NUMBER

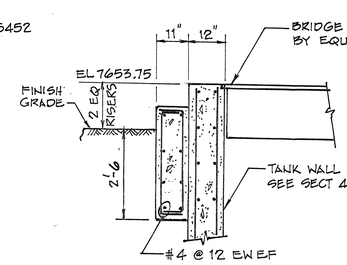
132845 DIETERICH-POST



SECTION 4/S451



SECTION 1/S451



SECTION 2/S451
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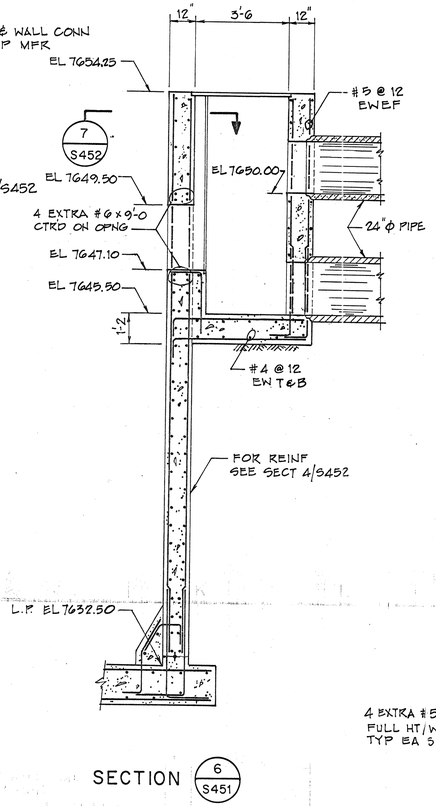

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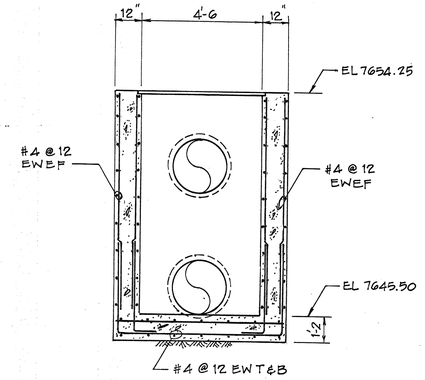
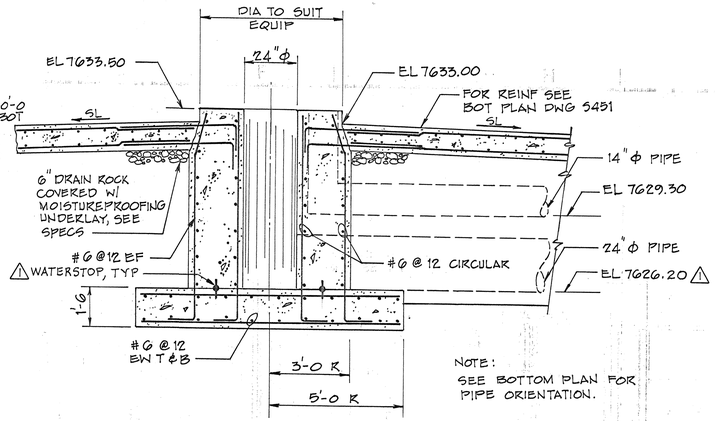
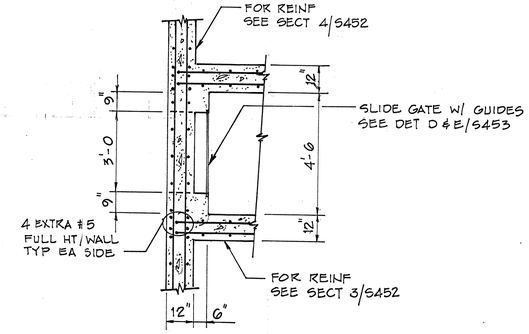


SECTION 3/S451



SECTION 5/S451



SECTION 7/S452

RECORD DRAWING
BY [signature] DATE 7-9-97
THIS RECORD DRAWING WAS PREPARED USING INFORMATION REPORTED TO BROWN AND CALDWELL AND CONTAINS ONLY THE STANDARD AND CUSTOMARY LEVEL OF DETAIL. THE INFORMATION WAS NOT INDEPENDENTLY FIELD VERIFIED. THERE IS NO ONGOING PROGRAM TO UPDATE THE DRAWINGS TO REFLECT CHANGES SUBSEQUENT TO THE DATE INDICATED. THEREFORE, THIS DRAWING CANNOT BE RELIED UPON AS AN EXACT REPRESENTATION OF ACTUAL CONDITIONS.

SCALE: 3/8" = 1'-0 EXCEPT AS NOTED

BROWN AND CALDWELL

SUBMITTED: [signature] Project Manager DATE: 4-30-96
APPROVED: [signature] Brown and Caldwell DATE: 4-30-96
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN FRP
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK No. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL A. SCHULTE No. 2251 Exp. 3-31-93 STRUCTURAL STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	FIELD CHANGE	DL	11-92	CJK

MAMMOTH COUNTY WATER DISTRICT

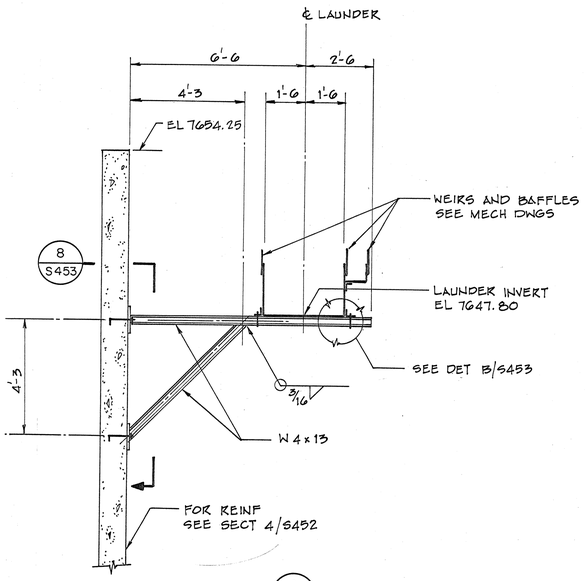
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

SECONDARY CLARIFIERS 1 & 2

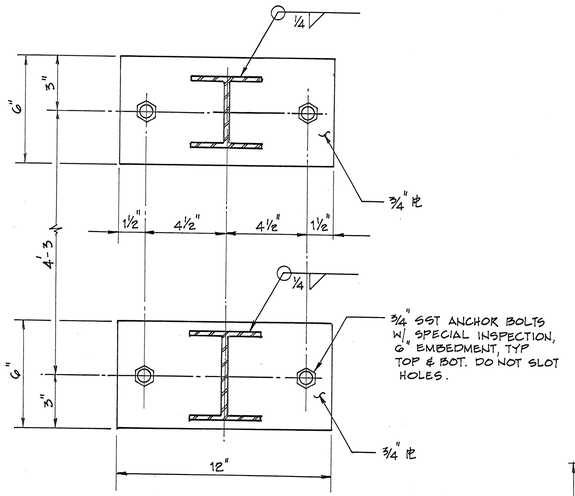
SECTIONS

DRAWING NUMBER S452
SHEET NUMBER

112545 DIETERICH-POST

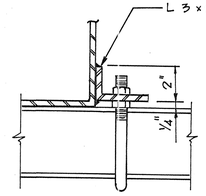


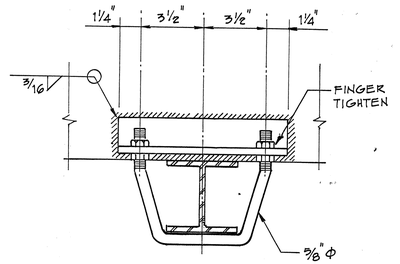
DETAIL A S451



SECTION 8 S453

SCALE: 3"=1'-0





DETAIL B S453

SCALE: 3"=1'-0

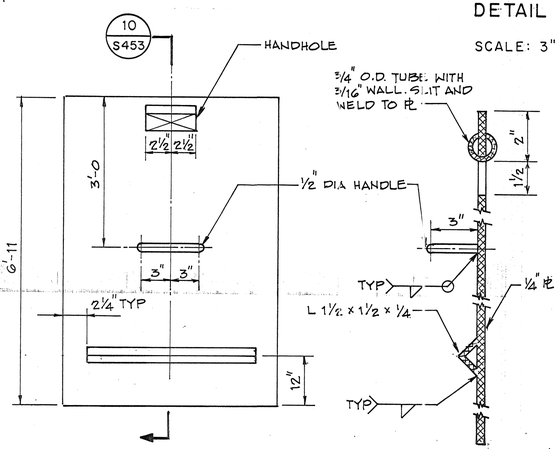


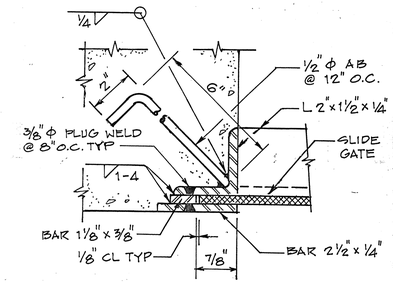
PLATE SLIDE GATE

DETAIL D S451

NTS

SECTION 10 S453

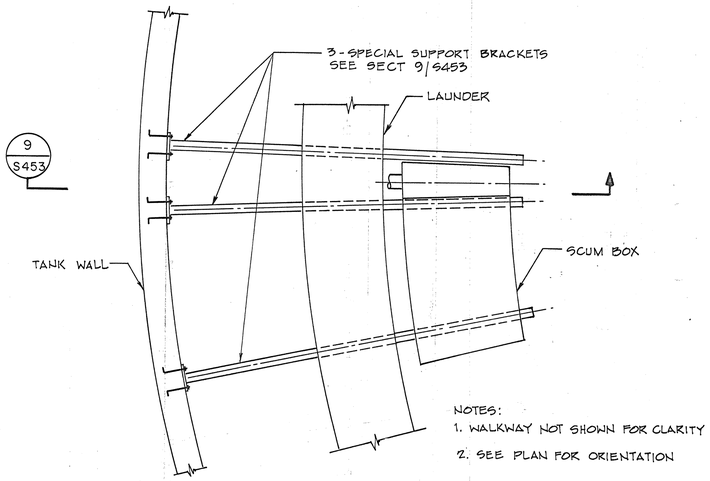
NTS



GATE GUIDE

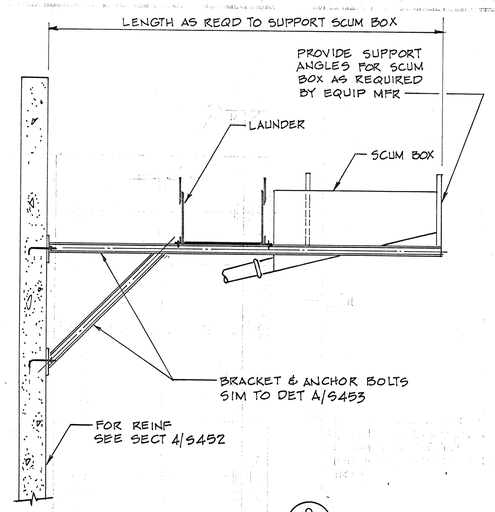
DETAIL E S452

NTS



NOTES:
1. WALKWAY NOT SHOWN FOR CLARITY
2. SEE PLAN FOR ORIENTATION

DETAIL C S451



SECTION 9 S453

SLIDE GATE & GATE GUIDE FABRICATION AND INSTALLATION NOTES:

1. ALL SLIDE GATES SHALL BE WELDED CONSTRUCTION OF ALUMINUM ALLOY 6061-T6 MEETING ASTM B308 UNLESS OTHERWISE NOTED. THE FINISHED SURFACES OF THE GATES THAT ENGAGE THE GUIDES SHALL BE WITHIN A COMMON PLANE. (TOLERANCE ± 1/16")
2. ALL SLIDE GATE GUIDES SHALL BE WELDED CONSTRUCTION AND SHALL BE GALVANIZED AFTER FABRICATION.
3. SLIDE GATE SHALL BE WITHIN A VERTICAL PLANE. (TOLERANCE ± 1/16")
4. INSIDE FACES OF GUIDE SLOTS SHALL BE PARALLEL. (TOLERANCE ± 1/16")
5. ALL SLIDE GATE GUIDES SHALL BE POSITIONED TO RECEIVE RESPECTIVE SLIDE GATES WITHIN PERMISSIBLE TOLERANCES BEFORE POURING CONCRETE.
6. ALL WELDS SHALL BE 3/16" FILLET CONTINUOUS UNLESS OTHERWISE NOTED. NO FIELD CUTTING OR WELDING SHALL BE PERMITTED EXCEPT WHERE NOTED SPECIFICALLY ON THE DRAWING OR IN THE SPECIFICATION.

RECORD DRAWING
BY [signature] DATE 7-9-97
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SCALE: 3/8" = 1'-0 EXCEPT AS NOTED

BROWN AND CALDWELL

SUBMITTED: [signature] Project Manager DATE: 4-30-90
APPROVED: [signature] Brown and Caldwell DATE: 4-30-90
APPROVED: _____ DATE: _____

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FILE 4788
DRAWN FRP
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — No. C040370 — Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL A. SCHULTE — No. 2251 — Exp. 3-31-93 — STRUCTURAL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

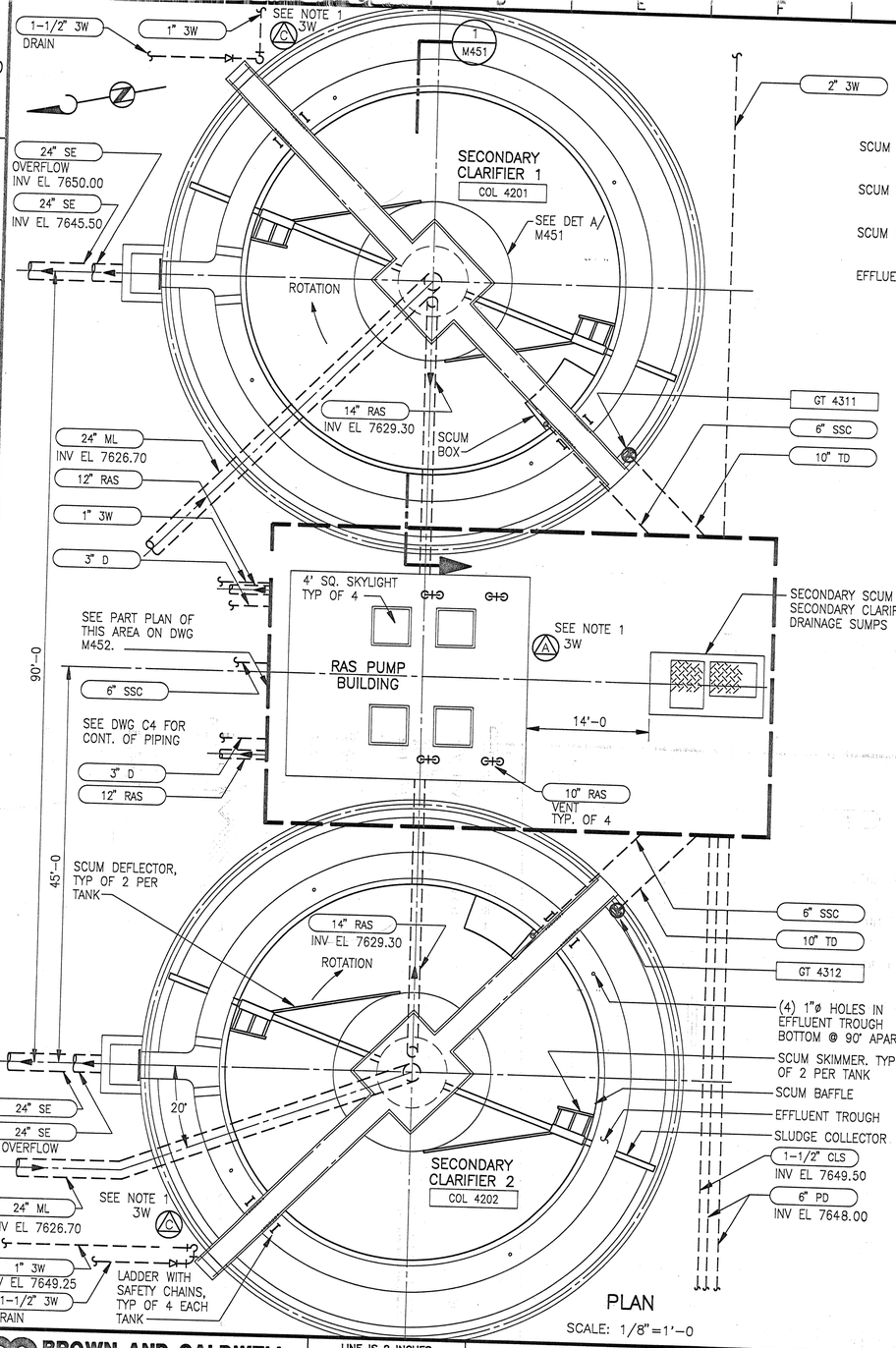
SECONDARY CLARIFIERS 1 & 2

SECTIONS AND DETAILS

DRAWING NUMBER S453

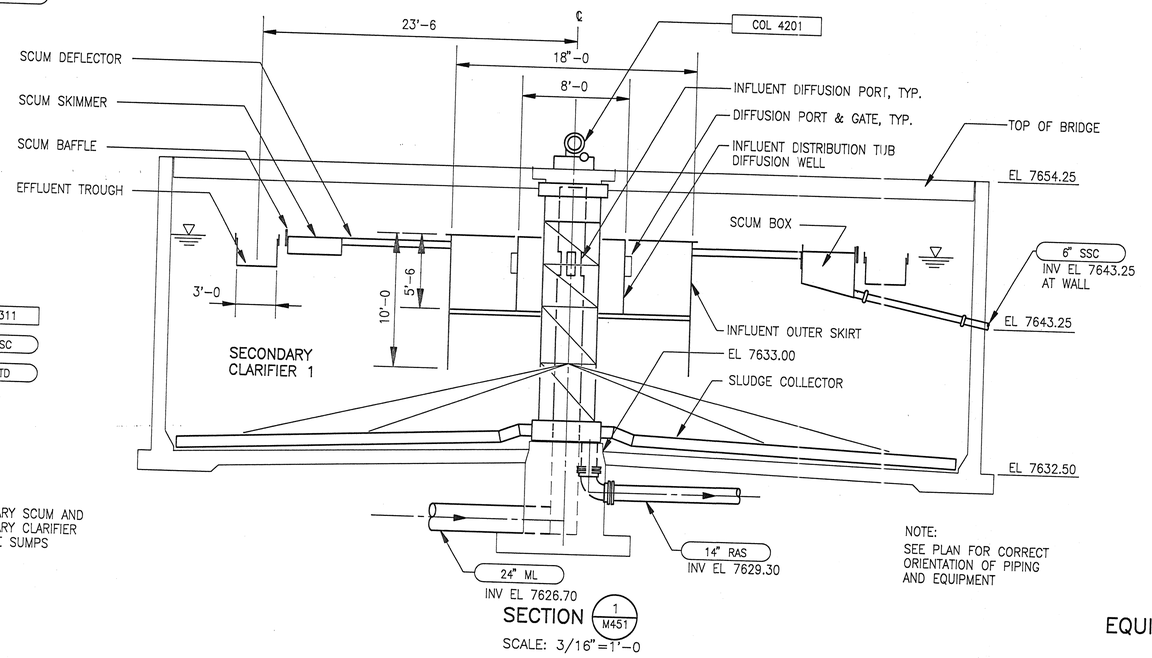
SHEET NUMBER

112645 DIETERICH-POST



PLAN

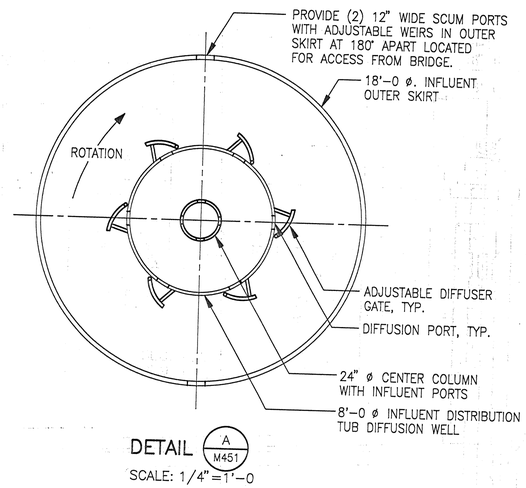
SCALE: 1/8"=1'-0



SECTION 1/M451

SCALE: 3/16"=1'-0

NOTE:
SEE PLAN FOR CORRECT ORIENTATION OF PIPING AND EQUIPMENT



DETAIL A/M451

SCALE: 1/4"=1'-0

EQUIPMENT LIST

COL	4201	SECONDARY CLARIFIER COLLECTOR 1
COL	4202	SECONDARY CLARIFIER COLLECTOR 2
P	4211	SECONDARY SCUM PUMP 1
P	4212	RETURN ACTIVATED SLUDGE PUMP 1
ASC	4212	ADJUSTABLE SPEED CONTROL 1
YV	4212	3W WATER SOLENOID VALVE 1
P	4213	RETURN ACTIVATED SLUDGE PUMP 2
ASC	4213	ADJUSTABLE SPEED CONTROL 2
YV	4213	3W WATER SOLENOID VALVE 2
P	4221	SECONDARY SCUM PUMP 2
P	4222	RETURN ACTIVATED SLUDGE PUMP 3
ASC	4222	ADJUSTABEL SPEED CONTROL 3
YV	4222	3W WATER SOLENOID VALVE 3
P	4223	RETURN ACTIVATED SLUDGE PUMP 4
ASC	4223	ADJUSTABLE SPEED CONTROL 4
YV	4223	3W WATER SOLENOID VALVE 4
P	4301	SECONDARY CLARIFIER DRAINAGE PUMP 1
P	4302	SECONDARY CLARIFIER DRAINAGE PUMP 2
GT	4311	SECONDARY CLARIFIER 1 DRAINAGE GATE
GT	4312	SECONDARY CLARIFIER 2 DRAINAGE GATE

NOTE:

1. PROVIDE 1" NON-FREEZE YARD HYDRANT, JAY R. SMITH MODEL NO. 5911, JOSAM SERIAL NO.71700, OR EQUAL. CONNECT 1/8" DRAIN HOLE TO 1-1/2" DRAIN PIPE.

RECORD DRAWING
BY _____ DATE 7-1-92
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BROWN AND CALDWELL
PASADENA, CALIFORNIA

SUBMITTED: _____ PROJECT MANAGER DATE: 4-10-91
APPROVED: _____ BROWN AND CALDWELL DATE: 4-30-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN AG
DESIGNED CJK
CHECKED AMM
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZMAR M. MALIK No. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY YOO No. 119389 Exp. 12-31-91 STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION-PHASE I

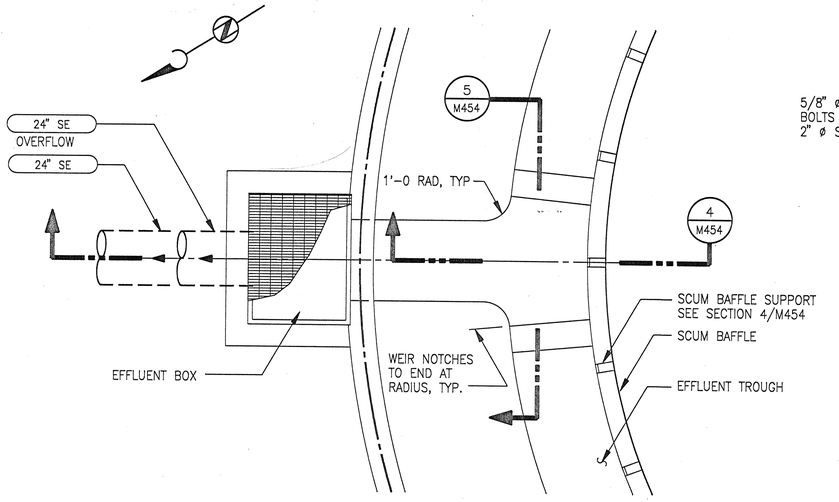
SECONDARY CLARIFIERS 1&2

PLAN, SECTION, DETAIL, AND EQUIPMENT LIST

DRAWING NUMBER M451

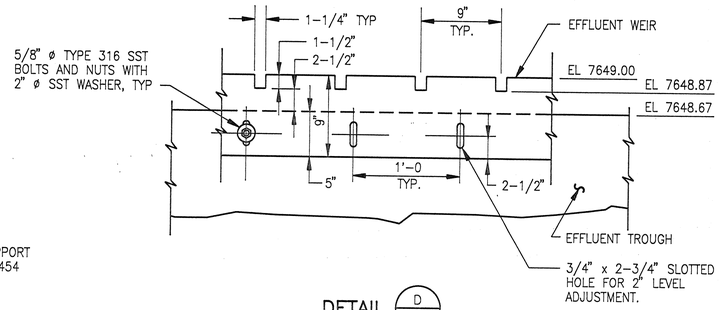
SHEET NUMBER

4788\M451 4/23/90 .125=12



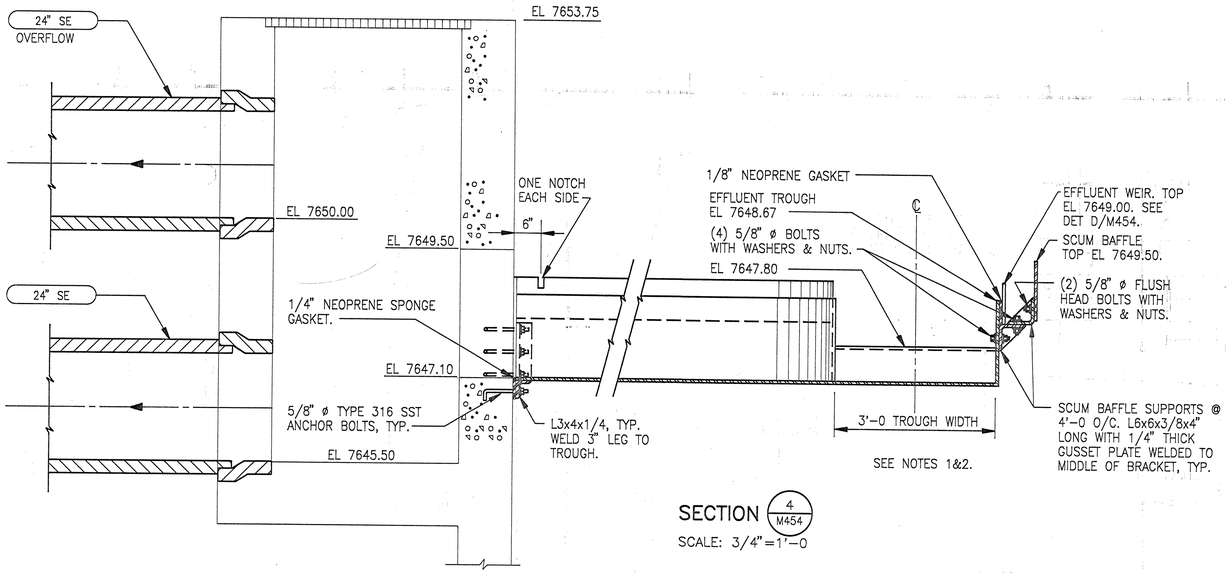
PART PLAN

SCALE: 3/8"=1'-0



DETAIL (D/M454)

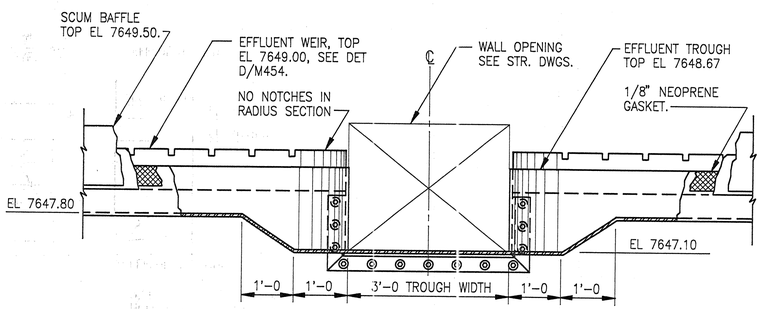
SCALE: 1-1/2"=1'-0



SEE NOTES 1&2.

SECTION (4/M454)

SCALE: 3/4"=1'-0



SEE NOTES 1&2.

SECTION (5/M454)

SCALE: 3/4"=1'-0

NOTES:

1. ALL FABRICATED STEEL ITEMS SHALL BE PAINTED WITH EPOXY PAINT, SEE SPEC'S.
2. ALL HARDWARE FOR WEIR PLATES AND BAFFLES SHALL TYPE 316 SST.

RECORD DRAWING
BY _____ DATE 7-9-93
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BROWN AND CALDWELL
PASADENA, CALIFORNIA

SUBMITTED: _____ DATE: 4-30-90
PROJECT MANAGER
APPROVED: _____ DATE: 4-30-90
BROWN AND CALDWELL
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)
FILE 4788
DRAWN AG
DESIGNED CJK
CHECKED AMM
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MAJIK No. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY KUO No. 119389 Exp. 12-31-91 STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

MAMMOTH COUNTY WATER DISTRICT

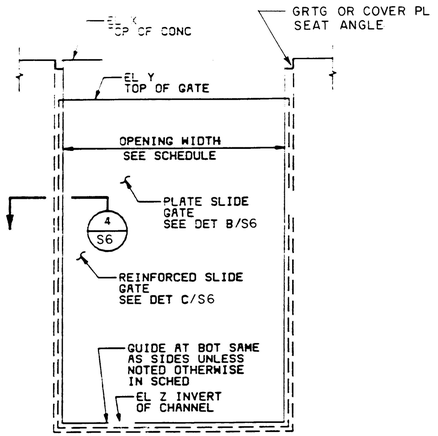
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION-PHASE I

SECONDARY CLARIFIERS 1&2

SECTIONS AND DETAILS-2

DRAWING NUMBER M454
SHEET NUMBER

4788\M454 2/21/90 .25=12



TYPICAL SLIDE GATE ARRANGEMENT

DETAIL A VAR

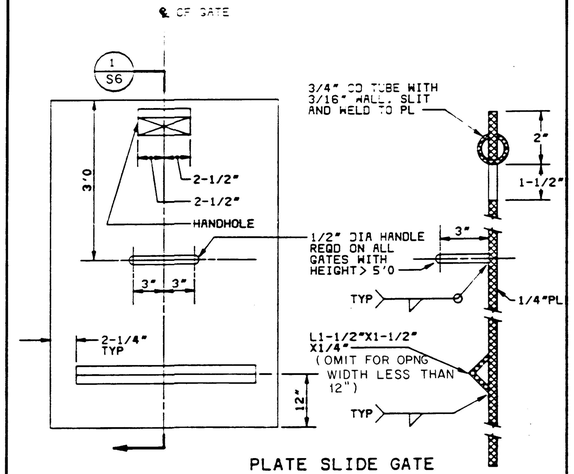
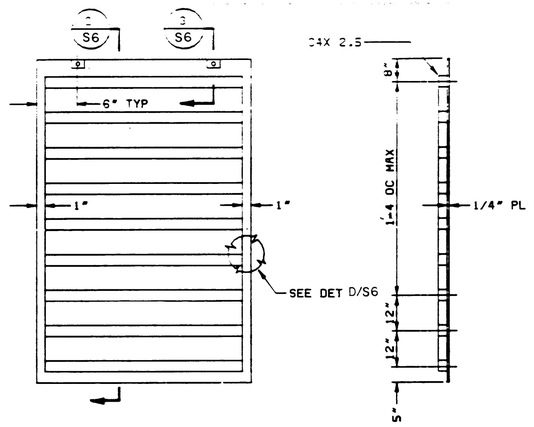


PLATE SLIDE GATE

DETAIL B S6

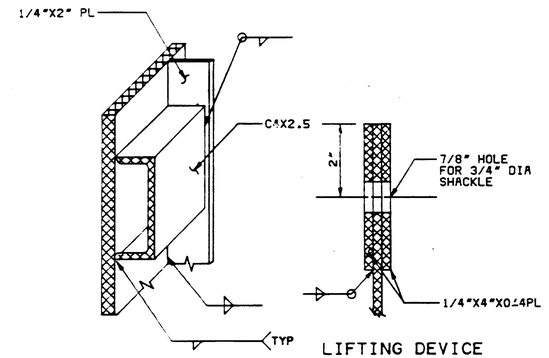
SECTION 1 S6



REINFORCED SLIDE GATE

DETAIL C S6

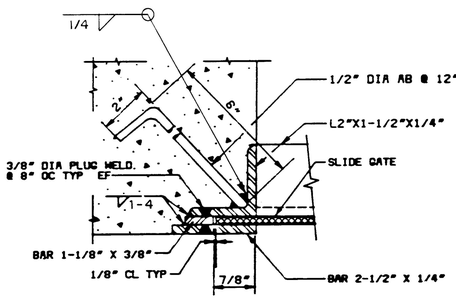
SECTION 2 S6



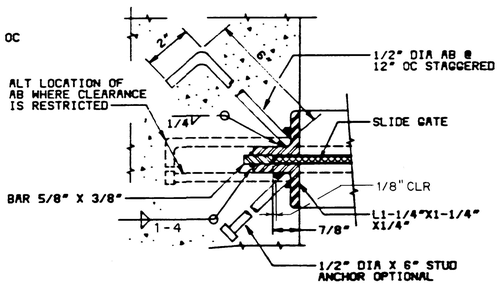
LIFTING DEVICE

DETAIL D S6

SECTION 3 S6



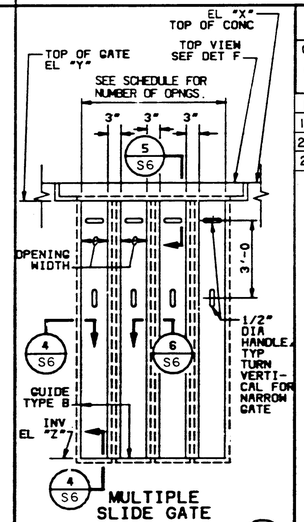
TYPE A



TYPE B

TYPICAL SLIDE GATE GUIDES

SECTION 4 S6

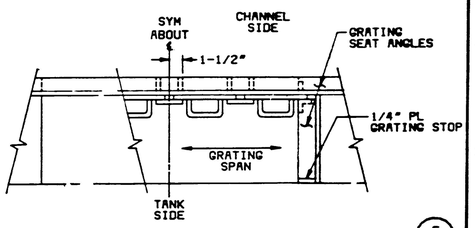


MULTIPLE SLIDE GATE

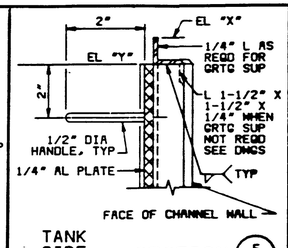
DETAIL E VAR

SLIDE GATE SCHEDULE

GATE NO.	REF DWG	GUIDE TYPE SIDE	GUIDE TYPE BOT	GUIDE TYPE SIDE	OPNG WIDTH	GATE TYPE	ELEVATION TOP CONC X	ELEVATION TOP GATE Y	ELEVATION INVERT Z	NO. REQD GUIDES	NO. REQD GATES	REMARKS
1-10	S301	B	B	B	0'-6	PLATE	7653.75	7653.50	7650.03	10	10	
11-20	S301	B	B	B	1'-6	PLATE	7653.75	7653.50	7650.45	10	10	
21-24	S401	B	B	B	4'-0	REINF	7653.75	7653.50	7650.75	4	4	TWO INTO EXIST WALL
25	S401	B	B	B	2'-0	PLATE	7653.75	7653.50	7649.25	1	1	

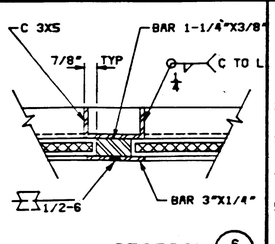


DETAIL F VAR



TANK SIDE

SECTION 5 S6



SECTION 6 S6

SLIDE GATES AND GATE GUIDES FABRICATION AND INSTALLATION NOTES

1. ALL SLIDE GATES SHALL BE WELDED CONSTRUCTION OF ALUMINUM ALLOY 6061-T6 MEETING ASTM B308 UNLESS OTHERWISE NOTED. THE FINISHED SURFACES OF THE GATES THAT ENGAGE THE GUIDES SHALL BE WITHIN A COMMON PLANE (TOLERANCE ±1/16").
2. LIFTING LUGS SHALL BE LOCATED SO THAT THE GATES HANG PLUMB WHEN SUSPENDED BY THE LUGS.
3. ALL SLIDE GATE GUIDES SHALL BE WELDED CONSTRUCTION AND SHALL BE GALVANIZED AFTER FABRICATION.
4. SLIDE GATE SHALL BE WITHIN A VERTICAL PLANE (TOLERANCE ±1/16").
5. INSIDE FACES OF GUIDE SLOTS SHALL BE PARALLEL (TOLERANCE ±1/16").
6. ALL SLIDE GATE GUIDES SHALL BE POSITIONED TO RECEIVE RESPECTIVE SLIDE GATES WITHIN PERMISSIBLE TOLERANCES BEFORE POURING CONCRETE.
7. ALL WELDS SHALL BE 3/16" FILLET CONTINUOUS UNLESS NOTED OTHERWISE. NO FIELD CUTTING OR WELDING SHALL BE PERMITTED EXCEPT WHERE NOTED SPECIFICALLY ON THE DRAWINGS OR IN THE SPECIFICATIONS.

11158

BROWN AND CALDWELL

SUBMITTED _____ DATE: 12-26-90
APPROVED: _____ DATE: 12-27-90
Brown and Caldwell
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN DKS
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL A. SCHULTE NO. 2251 Exp. 3-31-93 CIVIL STATE OF CALIFORNIA

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES WASTEWATER TREATMENT PLANT EXPANSION—PHASE II

TYPICAL SLIDE GATE DETAILS

DRAWING NUMBER ⚠S6

SHEET NUMBER 52

DIETERICH-POST

EXISTING AERATION TANKS 1 & 2
SEE MECH. DWGS

REMOVE EXIST CONC SLABS TO PROVIDE 3'-0 OF TYPE "G" GRAT'G AT NEW AIR HEADERS ONLY. SEE SECT 11/S403 AND MECH DWGS, TYP 2 PLS

EXP JTS @ 10'-0 MAX

85'-10 ±

1 S402

TYPE "G" GRAT'G, SEE DET B/S5

℄ NEW AIR HEADER, TYP 2 PLACES, SEE MECH DWGS

EXISTING HANDRAILING

SEE NOTE 1

AIR PIPE CHANNEL

1/2" EXP. JOINT, SEE DET. F/S3 WITHOUT WSTP, TYP

NEW HANDRAILING TO MATCH EXIST

2'-0 x 3'-0 OPNG INV EL 7649.25 SEE NOTE 4

3'-0 SQ OPNG INV EL 7637.67 SEE NOTE 4

2 S402

FUTURE AERATION TANK 1

NOT INCLUDED IN PCM NO. II

SEE NOTE 5

SEE NOTE 1

EXIST. GRAT'G PROTECT IN PLACE

3" CONC SLABS IN CHANNEL (REMOVE) PROVIDE TYPE "G" GRAT'G

REMOVE EXIST SAND FILL

RAS CHANNEL

28'-11 ±

REMOVE EXIST SLIDE GATE AND CONC. BULKHEAD

SEE NOTE 1

SEE NOTE 5

PROTECT EXIST. PLATFORM IN PLACE

PLUG 2 EXIST. WALL OPNGS: 2'-0 SQ AT INV. EL 7637.67 ± & 2'-0 x 3'-0 AT INV. EL 7649.25 ±, SEE DET. A/S402

2 S402

3'-0 SQ OPNG INV EL 7637.67 SEE NOTE 4

2'-0 x 3'-0 OPNG INV EL 7649.25 SEE NOTE 4

NEW HANDRAILING TO MATCH EXISTING

SALVAGE & RE-USE EXIST CONC SLABS

AERATION TANK 2 (EXISTING)

SEE NOTE 1

AIR PIPE CHANNEL

TYPE "B" GRAT'G

℄ NEW AIR HEADER, TYP 4 PLACES, SEE MECH DWGS

11 S403

NOT INCLUDED IN PCM NO. II

PLAN

SCALE: 1/4" = 1'-0

GRAT'G END SUPPORT SEE DET D/S5

8 S403

℄ 2'-0 W x 3'-0H GATE OPNGS. INVERT EL = 7649.00 SEE MECH. DWGS.

32'-3

12 S403A

NEW HANDRAILING TO MATCH EXIST.

10 S403

1" EXP. JT

WALL BELOW, SEE SECT 5/S402

℄ K.O. WALL (TYP OF 2) SEE SECT 12/S403A

TYPE "D" GRAT'G, SEE DET B/S5

24" PIPE ℄ EL 7640.75 SEE MECH DWGS

5 S402

℄ K.O. WALL

REMOVE WALLS OF EXIST RAS CHANNEL AND BEND EXIST. REINF. INTO NEW CONSTRUCTION, SEE NOTE 3

9 S403

TYPE "G" GRAT'G, SEE DET B/S5

3'-0 SQ GATE OPNG INVERT EL = 7649.00 SEE MECH. DWGS

TYPE "G" GRAT'G SEE DET B/S5

WASTE ACTIVATED SLUDGE SUMP

WALL BELOW, SEE SECT 5/S402

8 S403

REMOVE EXIST SLIDE GATE AND CONC. BULKHEAD

℄ RAS CHANNEL

L4 x 3 x 1/4 GRAT'G END SUPPORT, TYP EA SIDE/ SLIDE GATE SIM TO DET D/S5

GRAT'G OVER SLIDE GATE, TYP

2 #4 T & B HOOK ENDS OF TOP BARS IN WALLS

4'-0 SQ HATCH FOR 230 PSF MIN LIVE LOAD, BILCO OR EQUAL

SUMP BELOW WITH TYPE "B" GRTG

LADDER RUNGS, SEE DET G/S4

6 S402

PUMP VAULT

7 S402

SEE NOTE 1

11 S403

SEE NOTE 5

NEW HANDRAILING TO MATCH EXIST

TYPE "D" GRAT'G SEE DET B/S5

CAST AGAINST EXIST WALL WITH 1/2" x 1/2" SEALANT ALL AROUND

SEE NOTE 1

3 S402

4 S402

GRAT'G END SUPPORT, SEE DET D/S5

PRIMARY EFFLUENT CHANNEL

TYPE "B" GRAT'G, SEE DET B/S5

EXIST. GRAT'G IN EXIST CHANNEL PROTECT IN PLACE

NOTES:

1. EXISTING HANDRAILING MUST BE REMOVED TO ACCESS NEW WALKWAYS & GATE OPERATORS. ADD NEW END POSTS AT EACH BREAK.
2. ◇ INDICATES SLIDE GATE, SEE DWG S6. CUT OPNGS AS REQ'D TO INSTALL GUIDES AT EXIST. CONCRETE.
3. SEE NOTES M2, M3 & M4/S1 AND SEAL ALL JOINTS BET. EXIST. & NEW CHANNEL WALLS W/CONT. 1/2" x 1/2" SEALANT.
4. NEW SLIDE GATE IN EXIST WALL, SEE NOTE M9/S1 AND MECH DWGS.
5. CUT HOLE IN EXIST WALL FOR 24" PIPE AT ℄ EL 7640.75 DRY PACK GROUT IN PLACE, SEE MECH DWGS.

11163

BROWN AND CALDWELL

SUBMITTED: Project Manager DATE: 12-26-90
APPROVED: Brown and Caldwell DATE: 12-27-90
APPROVED: DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN DKS
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL A. SCHULTE NO. 2251 Exp. 3-31-93 STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	ADDENDUM NO. 1	CJK	1/91	AMM
	2	PCM NO.II - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

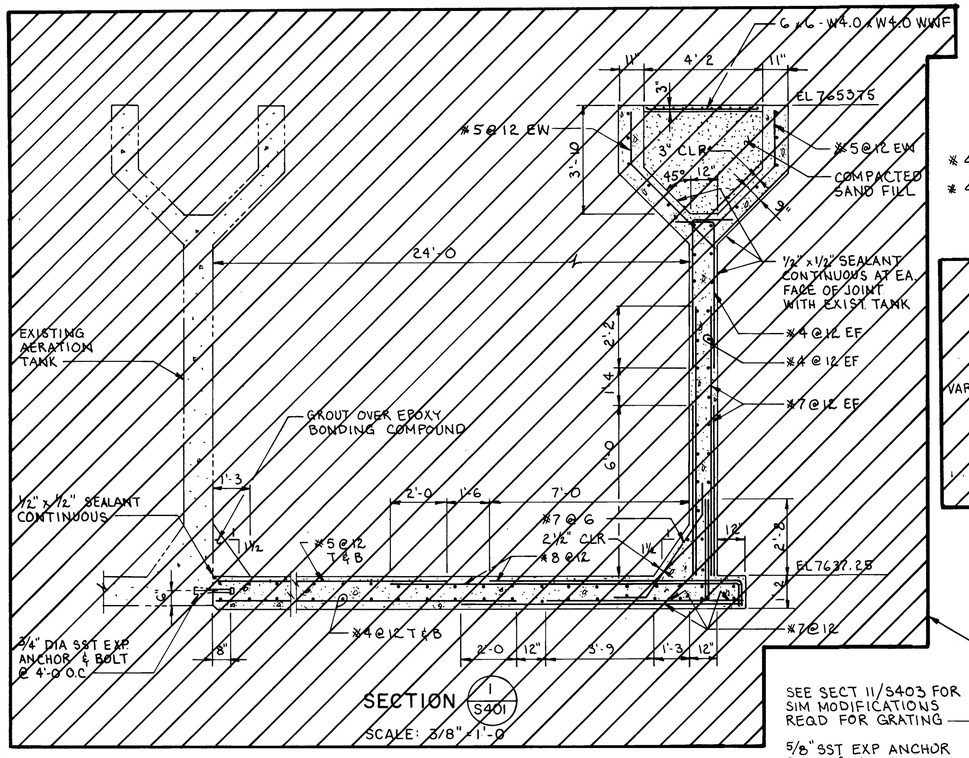
PLAN

DRAWING NUMBER 2S401A

SHEET NUMBER 57

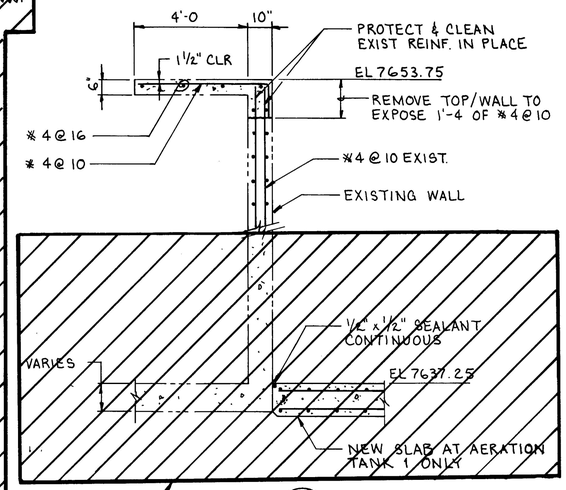
137426

DIETERICH-POST



SECTION 1 / S401

SCALE: 3/8" = 1'-0



SECTION 2 / S401

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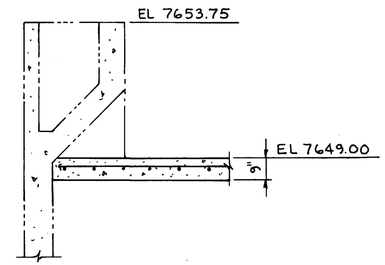
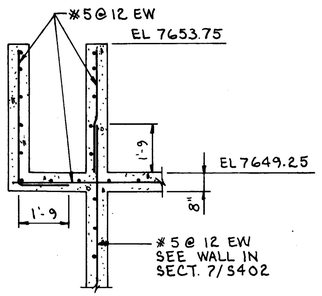
NOT INCLUDED IN PCM NO.11



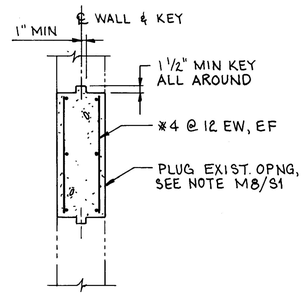
SECTION 3 / S401

SCALE: 3/8" = 1'-0



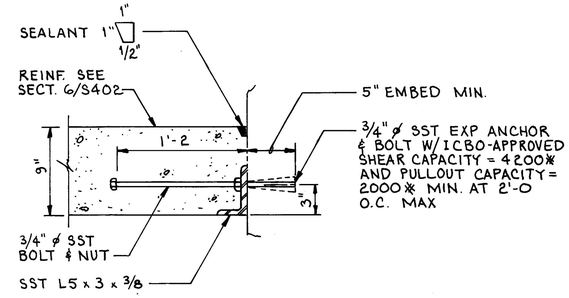
SECTION 4 / S401

SCALE: 3/8" = 1'-0



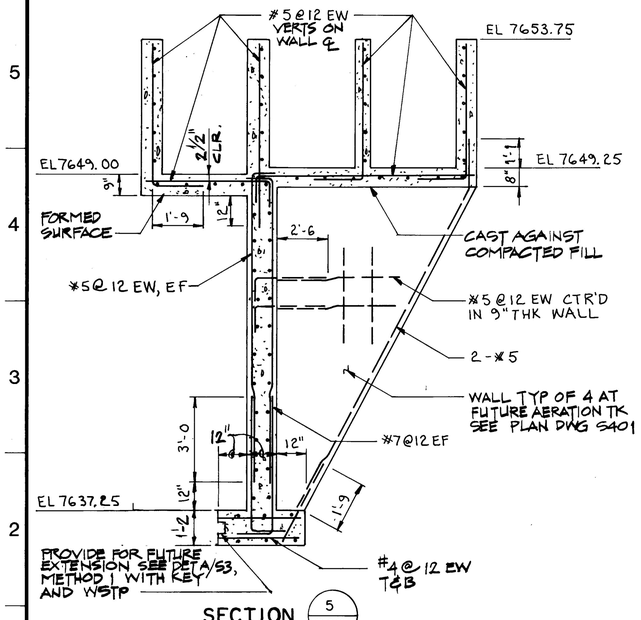
DETAIL A / S401

SCALE: 3/4" = 1'-0



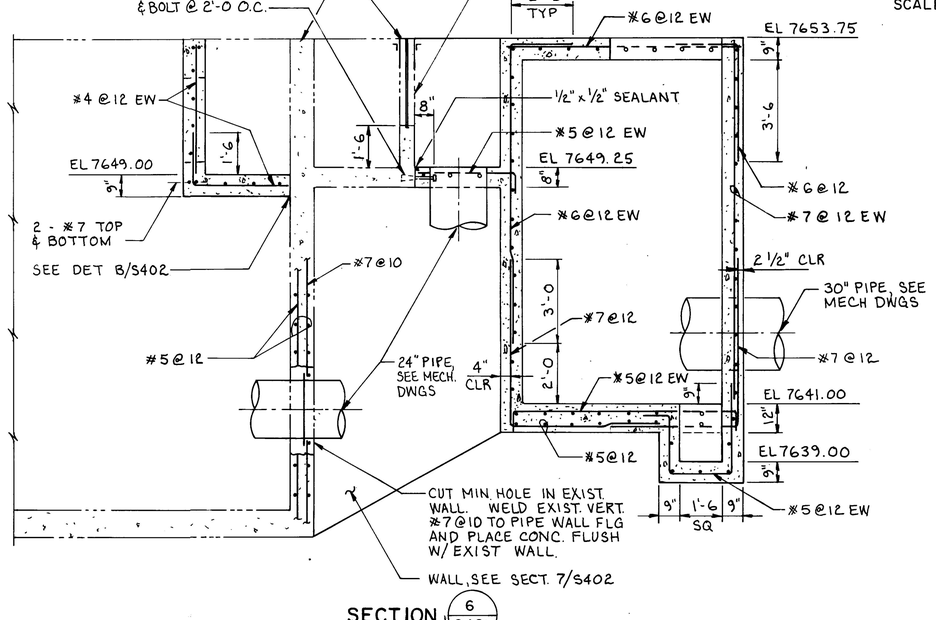
DETAIL B / S402

SCALE: 1-1/2" = 1'-0



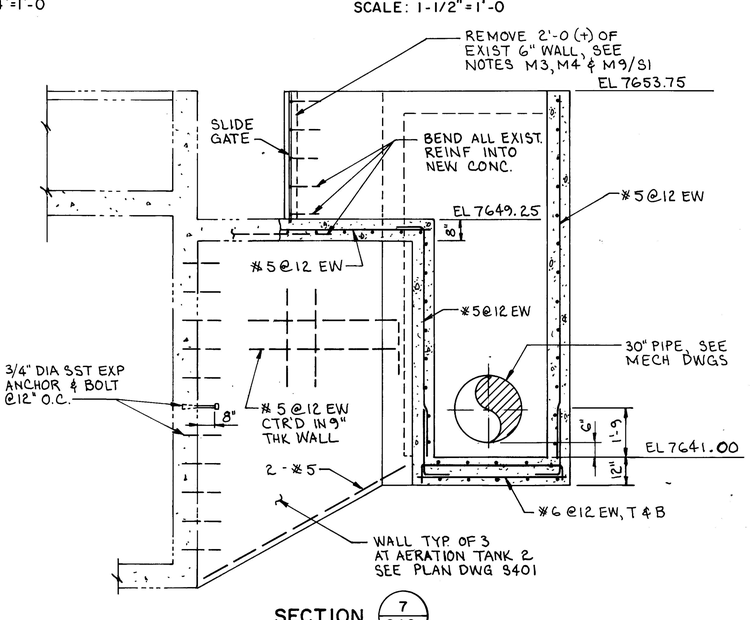
SECTION 5 / S401

SCALE: 3/8" = 1'-0



SECTION 6 / S401

SCALE: 3/8" = 1'-0



SECTION 7 / S401

SCALE: 3/8" = 1'-0

11164

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90

APPROVED: _____ Brown and Caldwell DATE: 12-27-90

APPROVED: _____ DATE: _____

137428

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN DKS
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL A. SCHULTE — NO. 2251 Exp. 3-31-93 — CONSTRUCTION MGMT. — STATE OF CALIFORNIA

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

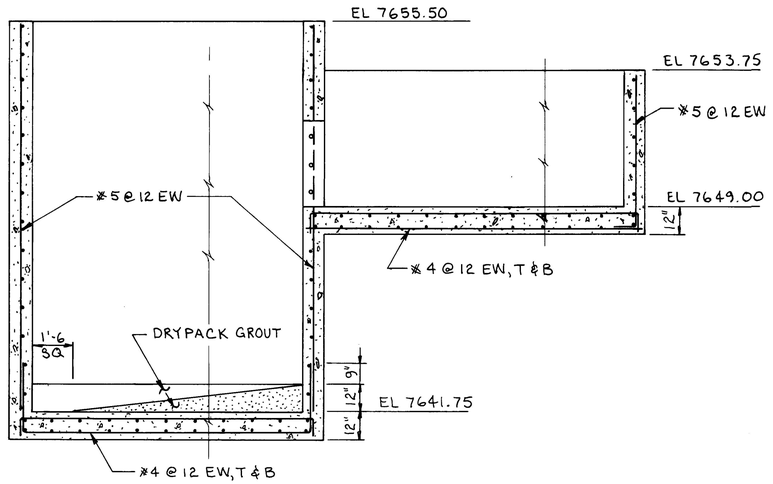
AERATION TANKS

SECTIONS AND DETAILS - 1

DRAWING NUMBER ⚠S402A

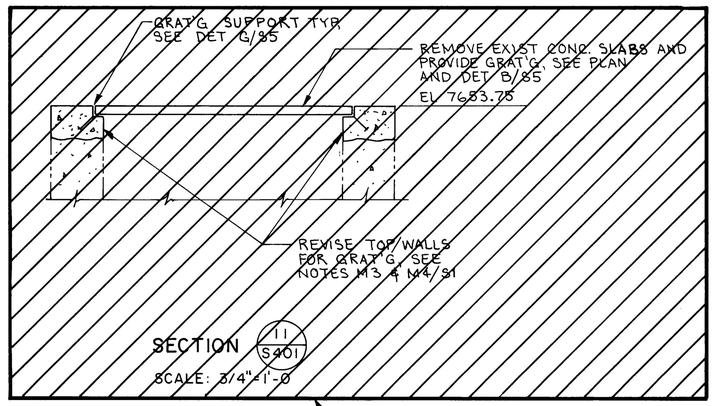
SHEET NUMBER 58

DIETERICH-POST



SECTION 8 / S401

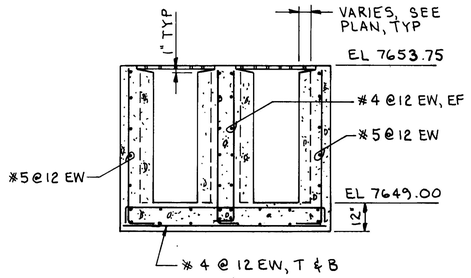
SCALE: 3/8"=1'-0



SECTION 11 / S401

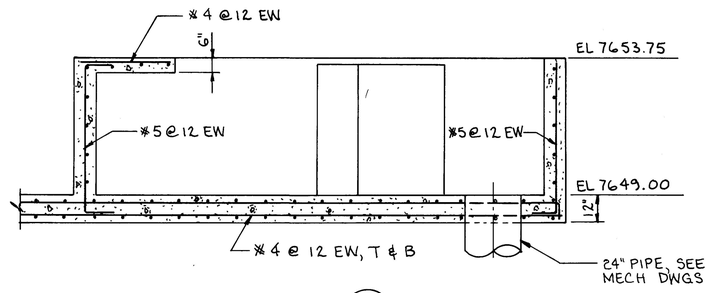
SCALE: 3/4"=1'-0

NOT INCLUDED IN PCM NO.11



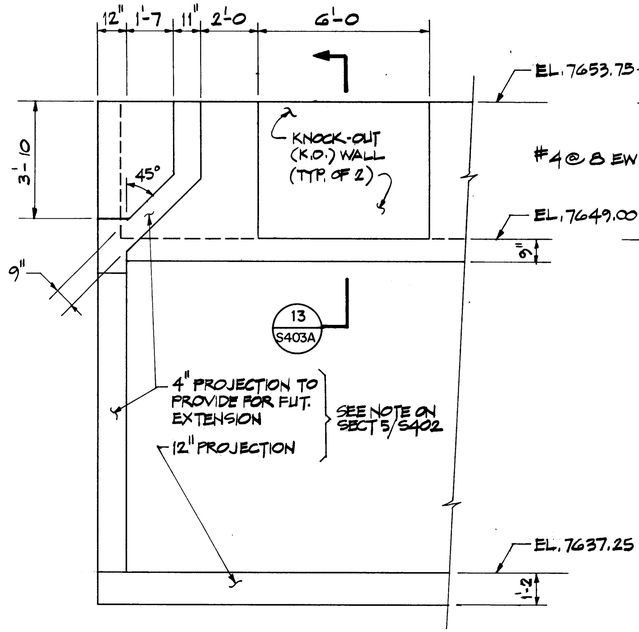
SECTION 9 / S401

SCALE: 3/8"=1'-0



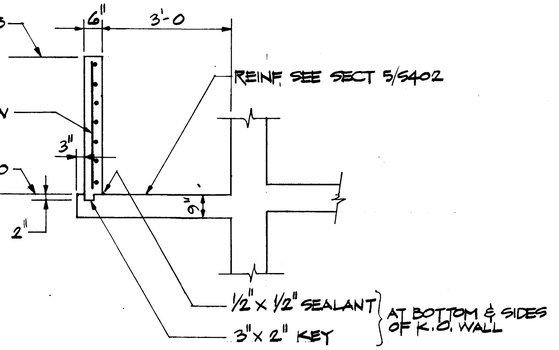
SECTION 10 / S401

SCALE: 3/8"=1'-0



SECTION 12 / S401A

SCALE: 3/8"=1'-0



SECTION 13 / S403A

SCALE: 3/8"=1'-0

11165

BROWN AND CALDWELL

SUBMITTED: _____ (Project Manager) DATE: 12-26-91

APPROVED: _____ (Brown and Caldwell) DATE: 12-27-90

APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788

DRAWN DKS

DESIGNED PAS

CHECKED PAS

CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — ZIHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL A. SCHULTE — NO. 2251 Exp. 3-31-93 — STRUCTURAL — STATE OF CALIFORNIA

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO.11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

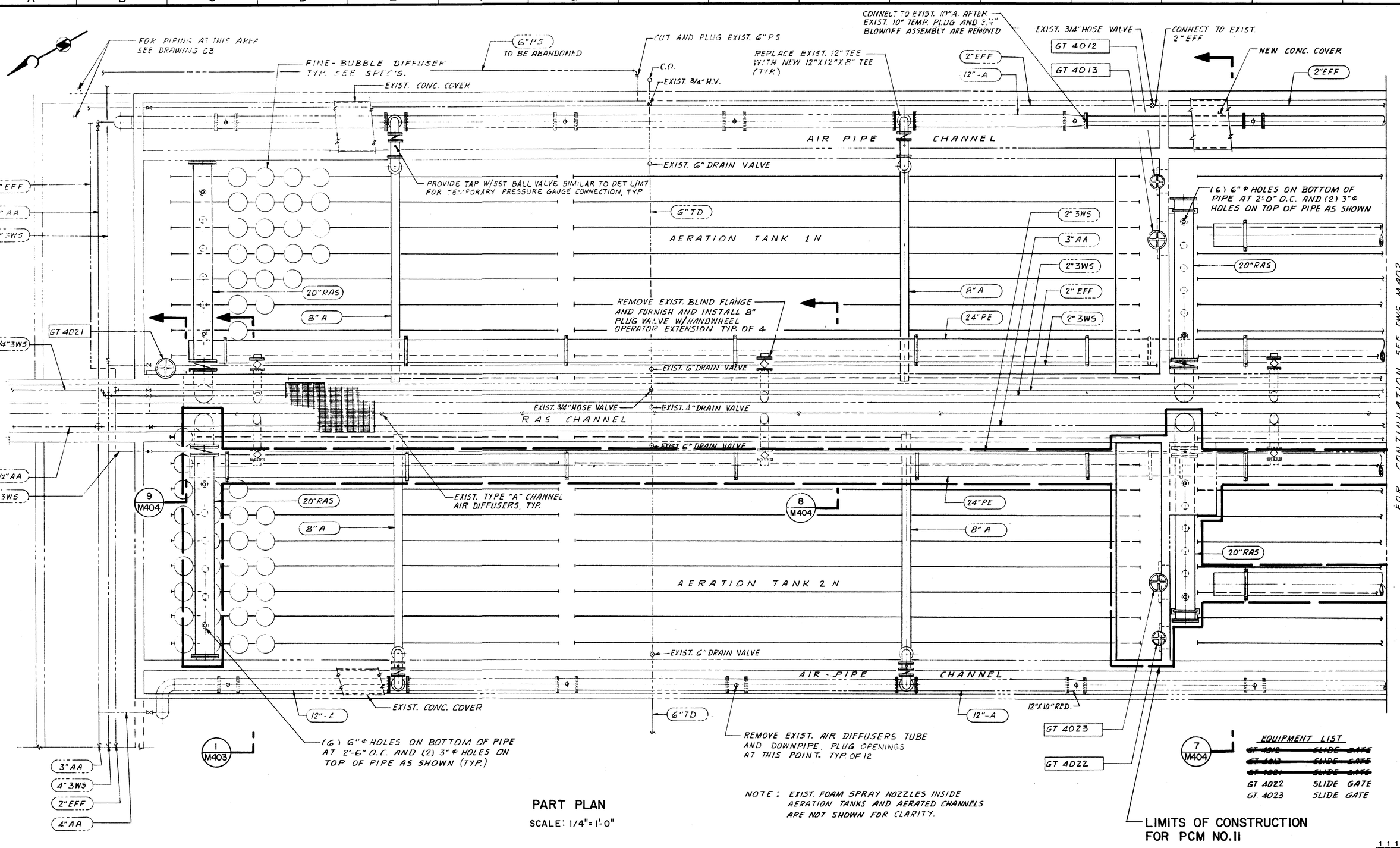
SECTIONS AND DETAILS -2

DRAWING NUMBER 1 S403A

SHEET NUMBER 59

137426

DIETERICH-POST



PART PLAN

SCALE: 1/4"=1'-0"

NOTE: EXIST. FOAM SPRAY NOZZLES INSIDE AERATION TANKS AND AERATED CHANNELS ARE NOT SHOWN FOR CLARITY.

11183

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90
APPROVED: _____ Brown and Caldwell DATE: 12-27-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMH

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — GYING-JEY KUO — No. 19789 Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO.11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

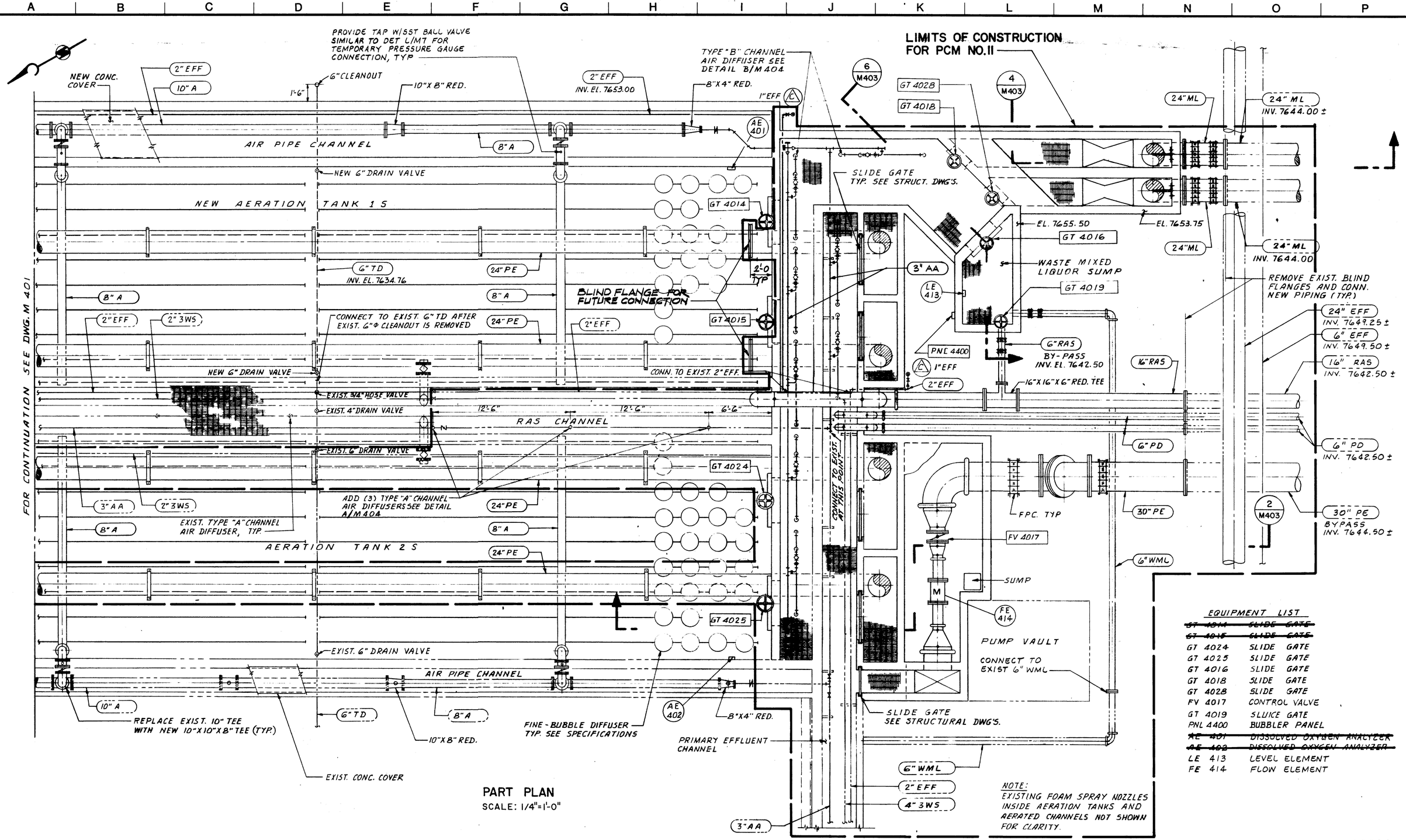
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

PART PLAN AND EQUIPMENT LIST -1

DRAWING NUMBER 1 M 401A
SHEET NUMBER 96

DIETERICH-POST



PART PLAN
SCALE: 1/4"=1'-0"

EQUIPMENT LIST	
~~GT 4014~~	~~SLIDE GATE~~
~~GT 4015~~	~~SLIDE GATE~~
GT 4024	SLIDE GATE
GT 4025	SLIDE GATE
GT 4016	SLIDE GATE
GT 4018	SLIDE GATE
GT 4028	SLIDE GATE
FV 4017	CONTROL VALVE
GT 4019	SLUICE GATE
PNL 4400	BUBBLER PANEL
~~AE 401~~	~~DISSOLVED OXYGEN ANALYZER~~
~~AE 402~~	~~DISSOLVED OXYGEN ANALYZER~~
LE 413	LEVEL ELEMENT
FE 414	FLOW ELEMENT

NOTE:
EXISTING FOAM SPRAY NOZZLES INSIDE AERATION TANKS AND AERATED CHANNELS NOT SHOWN FOR CLARITY.

11184

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90
APPROVED: _____ Brown and Caldwell DATE: 12-27-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY KUO NO. 17589 Exp. 12-31-91 CIVIL STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. II - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

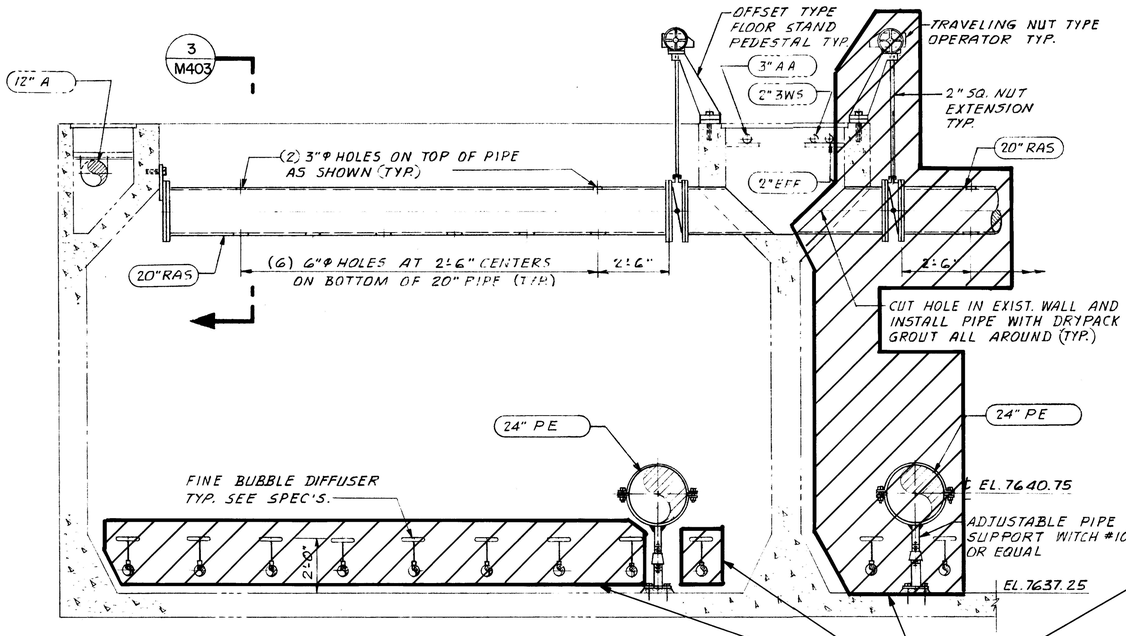
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

PART PLAN AND EQUIPMENT LIST - 2

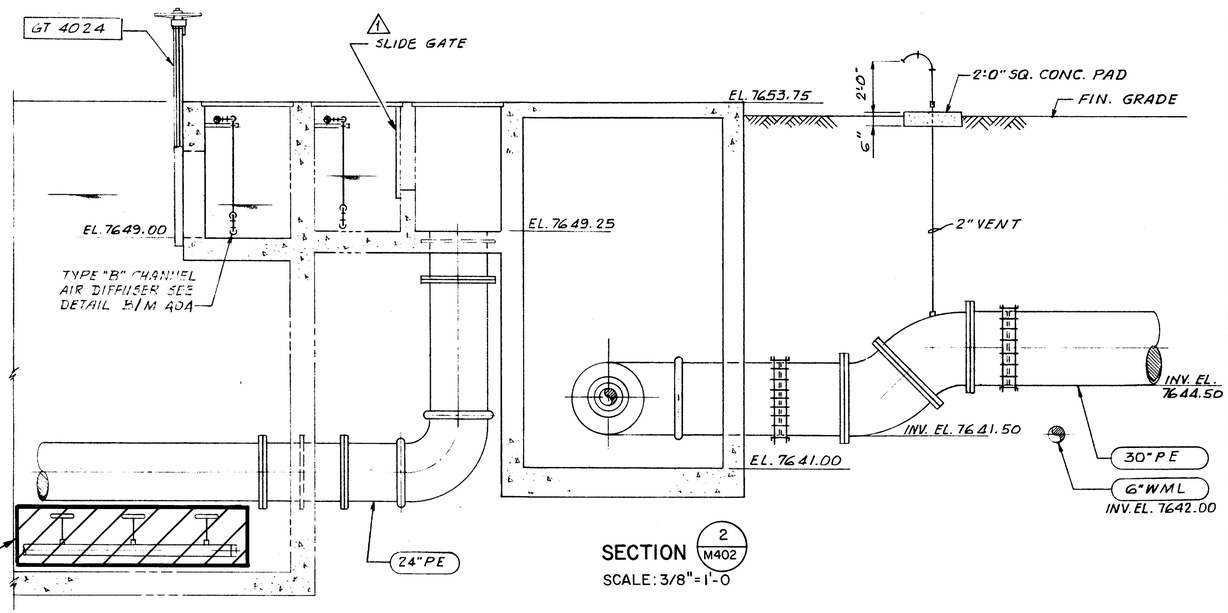
DRAWING NUMBER
⚠M402A
SHEET NUMBER
97

DIETERICH-POST



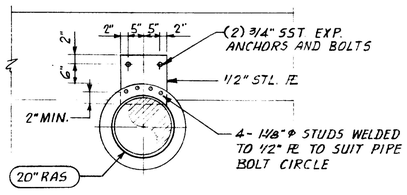
NOTE: EXISTING FOAM SPRAY NOZZLES AND PIPES (3WS) INSIDE THE AERATION TANKS ARE NOT SHOWN FOR CLARITY.

SECTION 1 / M401
SCALE: 3/8"=1'-0"

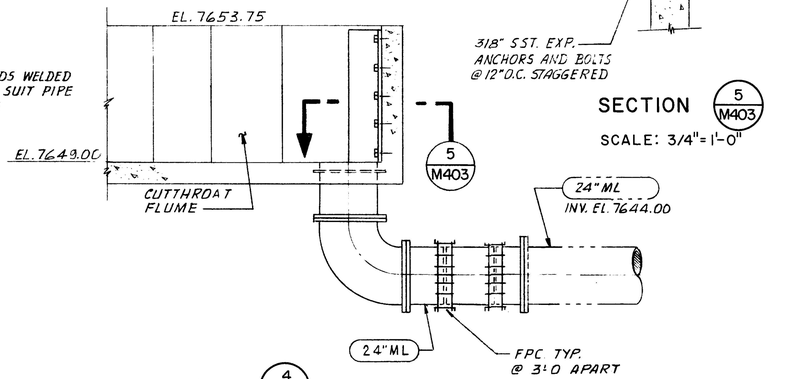


SECTION 2 / M402
SCALE: 3/8"=1'-0

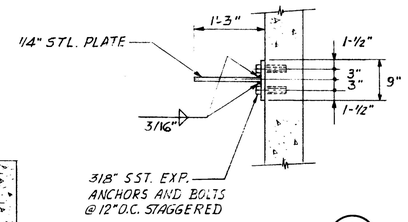
NOT INCLUDED IN PCM NO. 11



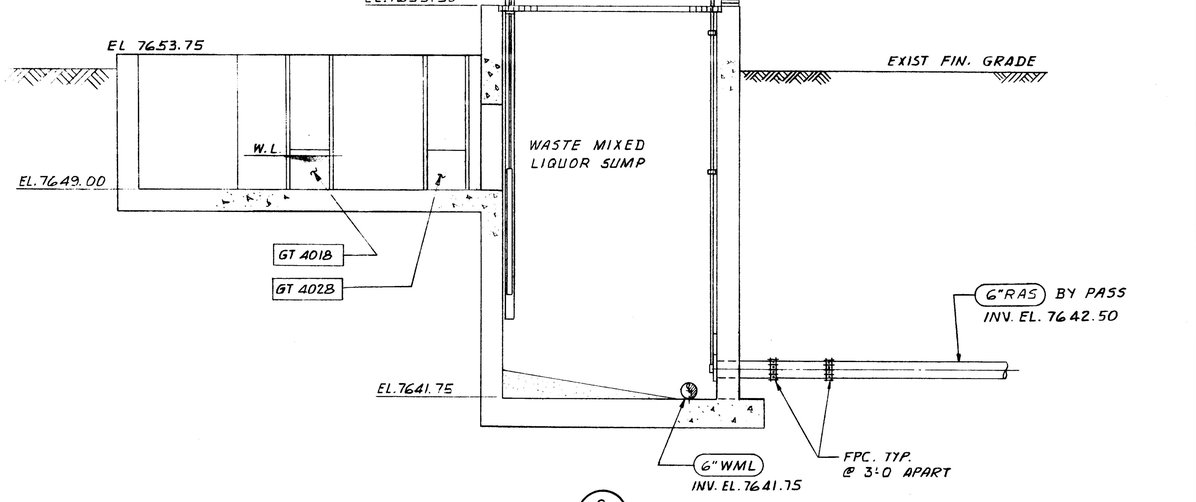
SECTION 3 / M403
SCALE: 1/2"=1'-0



SECTION 4 / M402
SCALE: 3/8"=1'-0"



SECTION 5 / M403
SCALE: 3/4"=1'-0"



SECTION 6 / M402
SCALE: 3/8"=1'-0"

11185

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90
APPROVED: _____ Brown and Caldwell DATE: 12-27-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — CHING-JEY KUO — NO. 35589 Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	ADDENDUM NO. 1	AG	1/91	CJK
	2	PCM NO. II - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

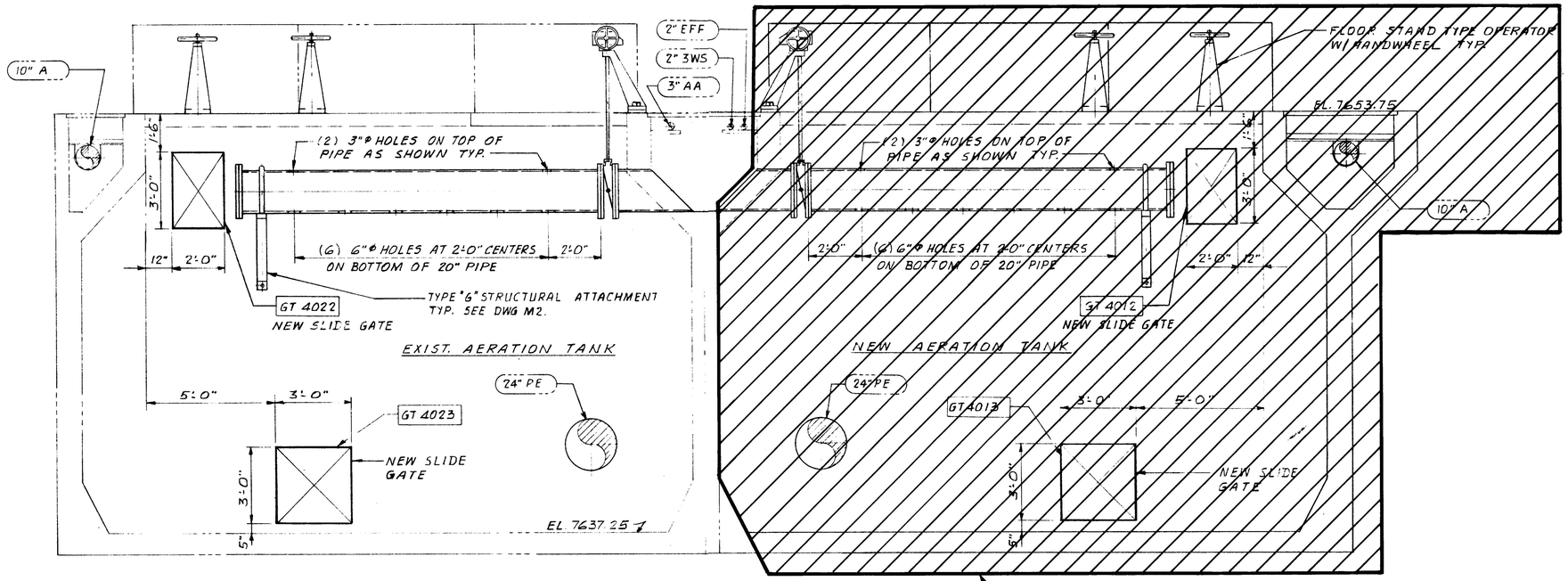
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

SECTIONS

DRAWING NUMBER 2 M403A
SHEET NUMBER 98

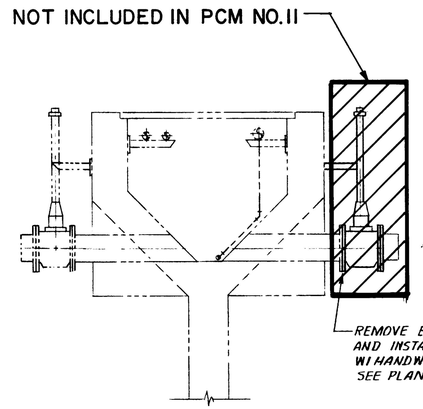
113848 DIETERICH-POST



SECTION 7/M401

SCALE: 3/8"= 1'-0"

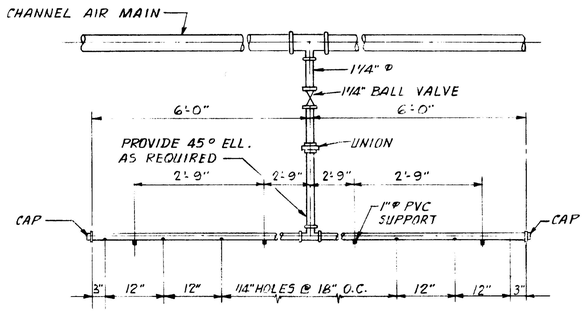
NOT INCLUDED IN PCM NO.II



SECTION 8/M401

SCALE: 1/2"= 1'-0"

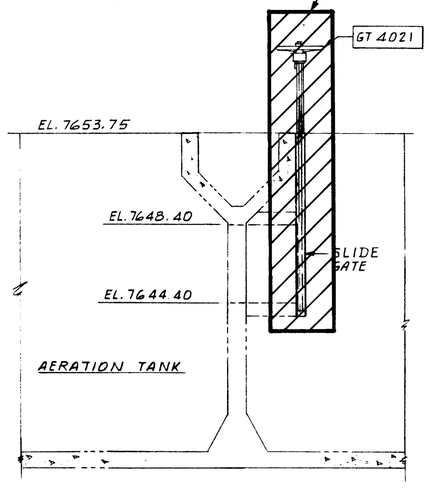
NOTES:
1- HOT DIP GALVANIZE ALL PARTS AFTER FABRICATION.
2- ALL HARDWARE SHALL BE STAINLESS STEEL.
3- * SEE PLAN DWG'S. FOR PIPE SIZE.
4- EXISTING FOAM SPRAY NOZZLES AND PIPES(3WS) INSIDE THE AERATION TANKS ARE NOT SHOWN FOR CLARITY.



TYPE "A" CHANNEL AIR DIFFUSER

DETAIL A/M404

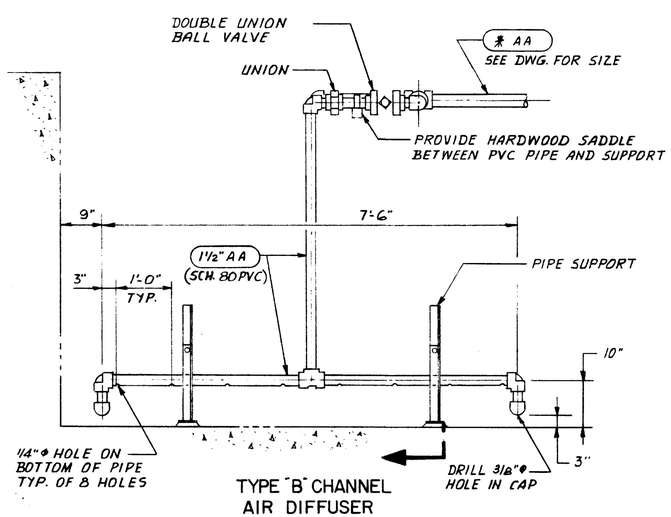
NOT TO SCALE



SECTION 9/M401

SCALE: 1/4"= 1'-0"

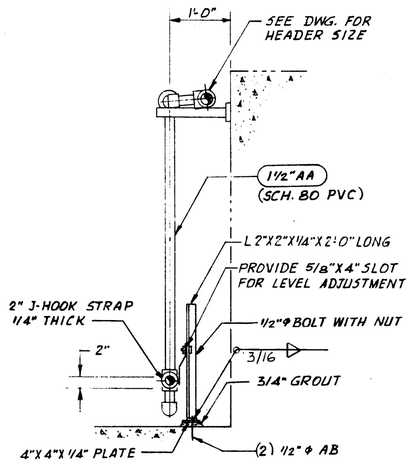
10/M404



TYPE "B" CHANNEL AIR DIFFUSER

DETAIL B/M402 B/M403

SCALE: 3/4"= 1'-0



SECTION 10/M404

SCALE: 3/4"= 1'-0

11186

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90

APPROVED: _____ Brown and Caldwell DATE: 12-27-90

APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY KUO No. 17601 Exp. 12-31-91 CIVIL STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO.II - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

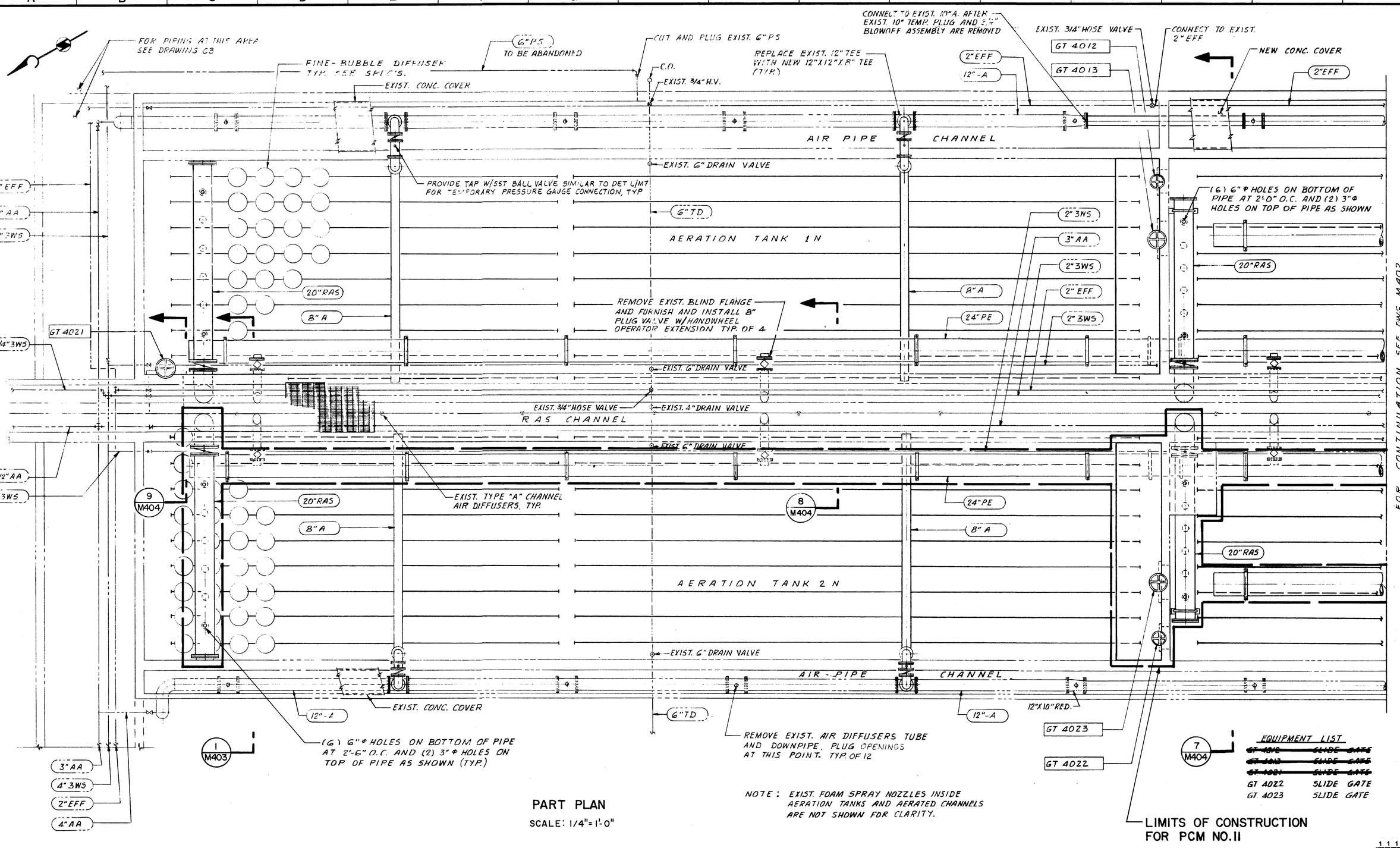
AERATION TANKS

SECTIONS AND DETAILS

DRAWING NUMBER 1M404A

SHEET NUMBER 99

DIETERICH-POST



PART PLAN

SCALE: 1/4"=1'-0"

NOTE: EXIST. FOAM SPRAY NOZZLES INSIDE AERATION TANKS AND AERATED CHANNELS ARE NOT SHOWN FOR CLARITY.

11183

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90
APPROVED: _____ Brown and Caldwell DATE: 12-27-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMH

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — GYING-JEY KUO — No. 19789 Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO.11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

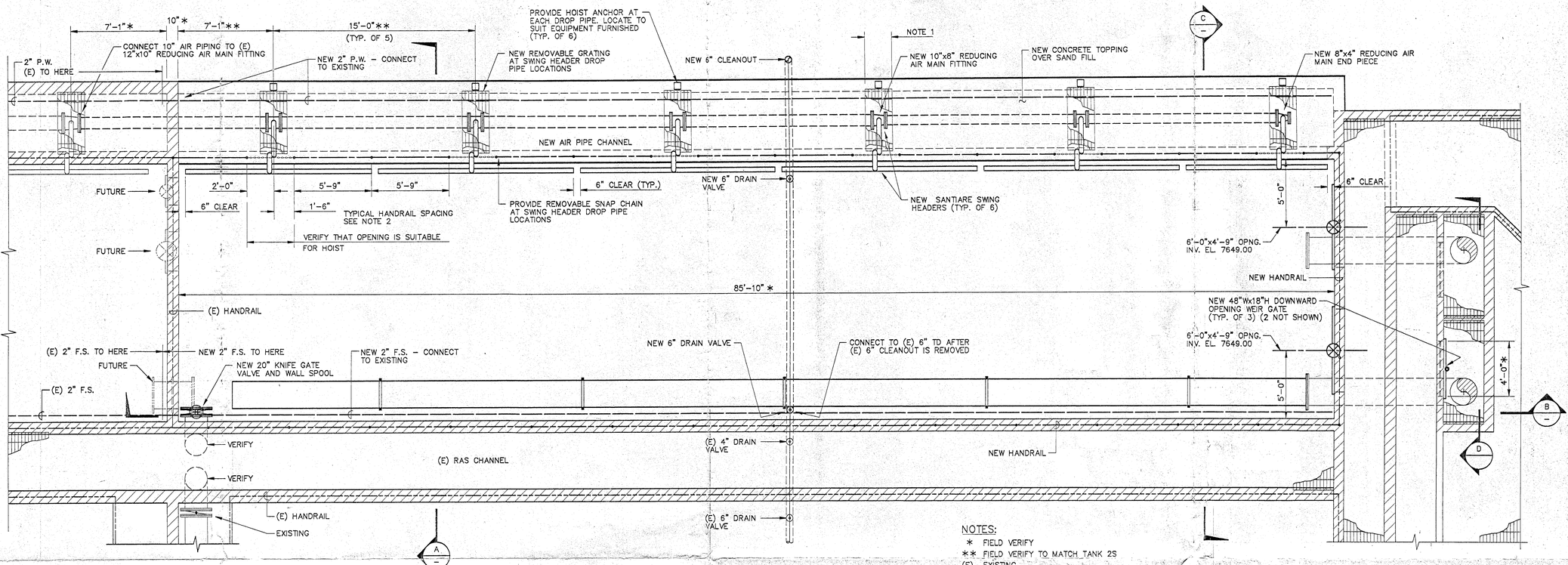
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

AERATION TANKS

PART PLAN AND EQUIPMENT LIST -1

DRAWING NUMBER 1 M 401A
SHEET NUMBER 96

DIETERICH-POST



NOTES:

* FIELD VERIFY

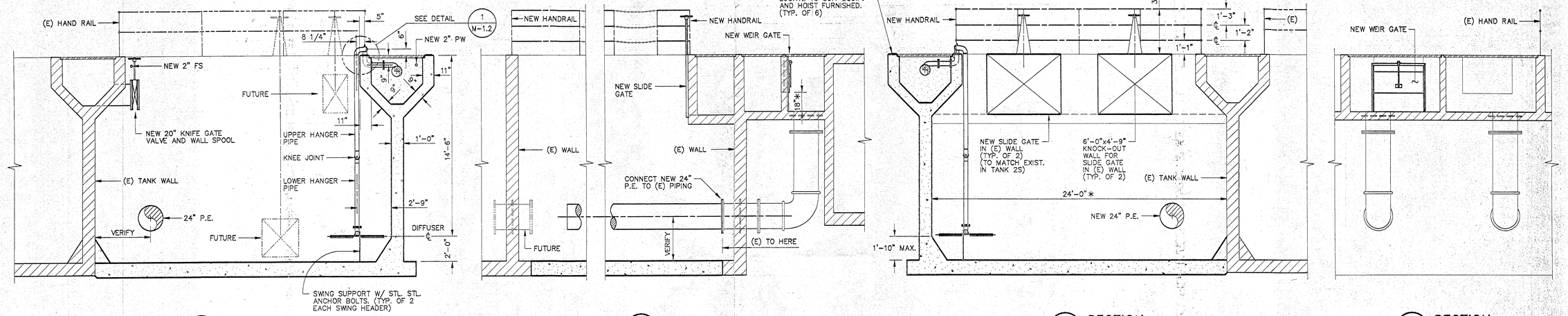
** FIELD VERIFY TO MATCH TANK 2S

(E) EXISTING

1. WDTH AS REQ'D TO PROVIDE 3" MIN. CLEARANCE FOR AIR PIPING FITTING ON EACH END OF FITTING.
2. FINAL LOCATION OF POSTS TO CLEAR DIFFUSERS. VERIFY WITH SWING HEADER MANUFACTURER.
3. CONTRACTOR TO VERIFY THAT HEADER WLL CLEAR SLIDE GATE DURUNG REMOVAL.

PLAN - AERATION TANK 1S

1/4"=1'-0"



A SECTION 1/4"=1'-0"

B SECTION 1/4"=1'-0"

C SECTION 1/4"=1'-0"

D SECTION 1/4"=1'-0"

NO.	DATE	REVISIONS	BY

PROJECT NO.	727447
DESIGNED BY:	
DRAWN BY:	M. ABEREGG 07/95
CHECKED BY:	D. Mc INTYRE 07/95
ENGINEER	
REGISTRATION NO.	DATE

ES ENVIRONMENTAL SERVICES
1301 MARINA VILLAGE PARKWAY, ALAMEDA, CA 94501 (510) 522-2238

PARSONS

MAMMOUTH LAKES WATER DISTRICT

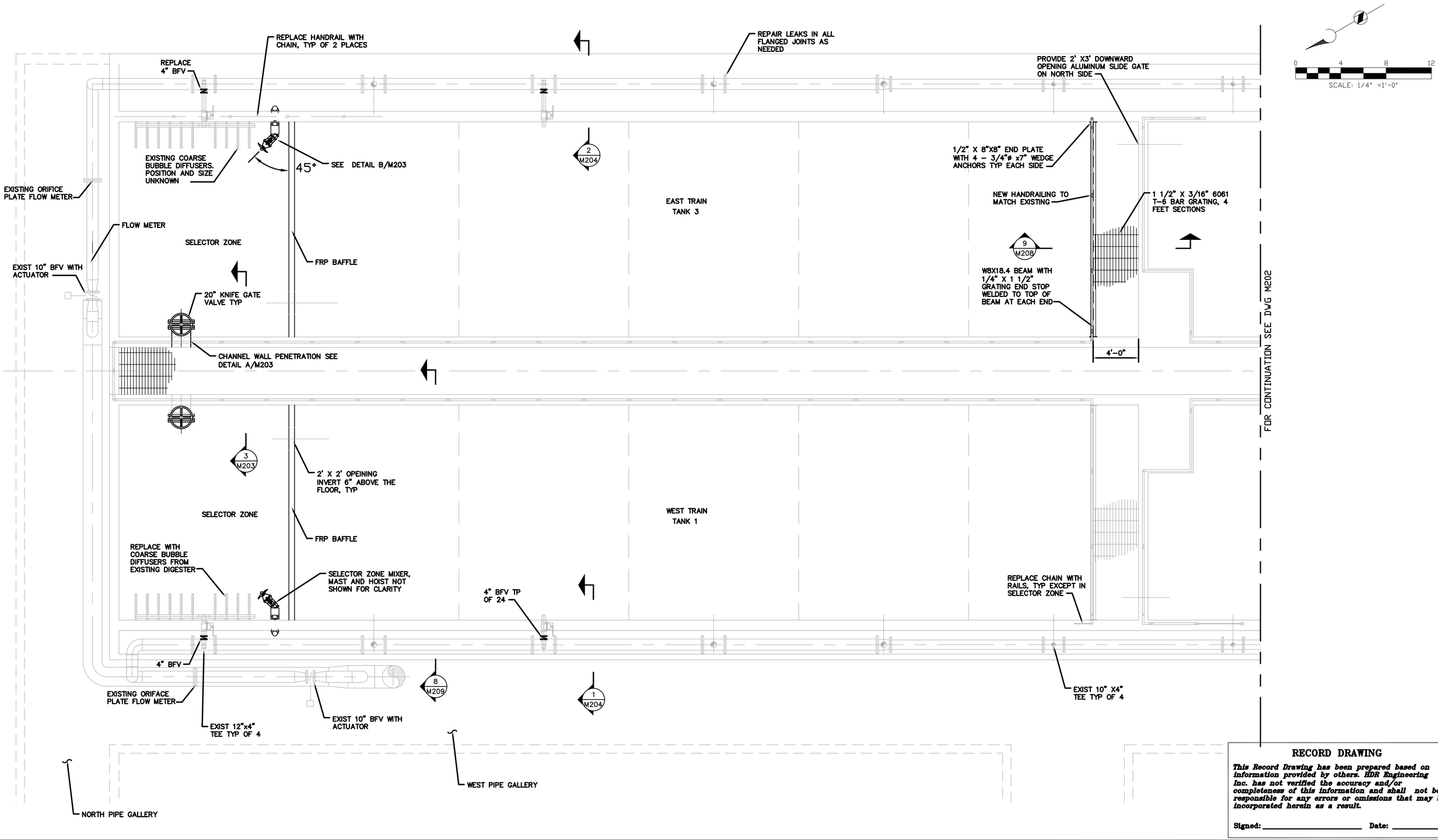
AERATION TANKS

AERATION TANK 1S

SCALE AS SHOWN
DRAWING NO. M-1.1
SHEET OF
PROJECT NO.

AUG 01, 1995 - 13:49:28 C:\MAMMOUTH\M1-1AL.DWG

AUG - 1 1995



RECORD DRAWING

This Record Drawing has been prepared based on information provided by others. HDR Engineering Inc. has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions that may be incorporated herein as a result.

Signed: _____ **Date:** _____

HDR/CGvL
26250 ENTERPRISE COURT, SUITE 150
LAKE FOREST, CALIFORNIA 92630
(949)454-4800 Fax(949)454-4801

SUBMITTED JUAN JOSSE (PROJECT MANAGER) DATE: _____
APPROVED JAMES CATHCART (PINCIPAL-IN-CHARGE) DATE: _____
APPROVED _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY: _____

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	JUAN JOSE	06/02/05	
	2	**RECORD DRAWING**	**06/10/06**	

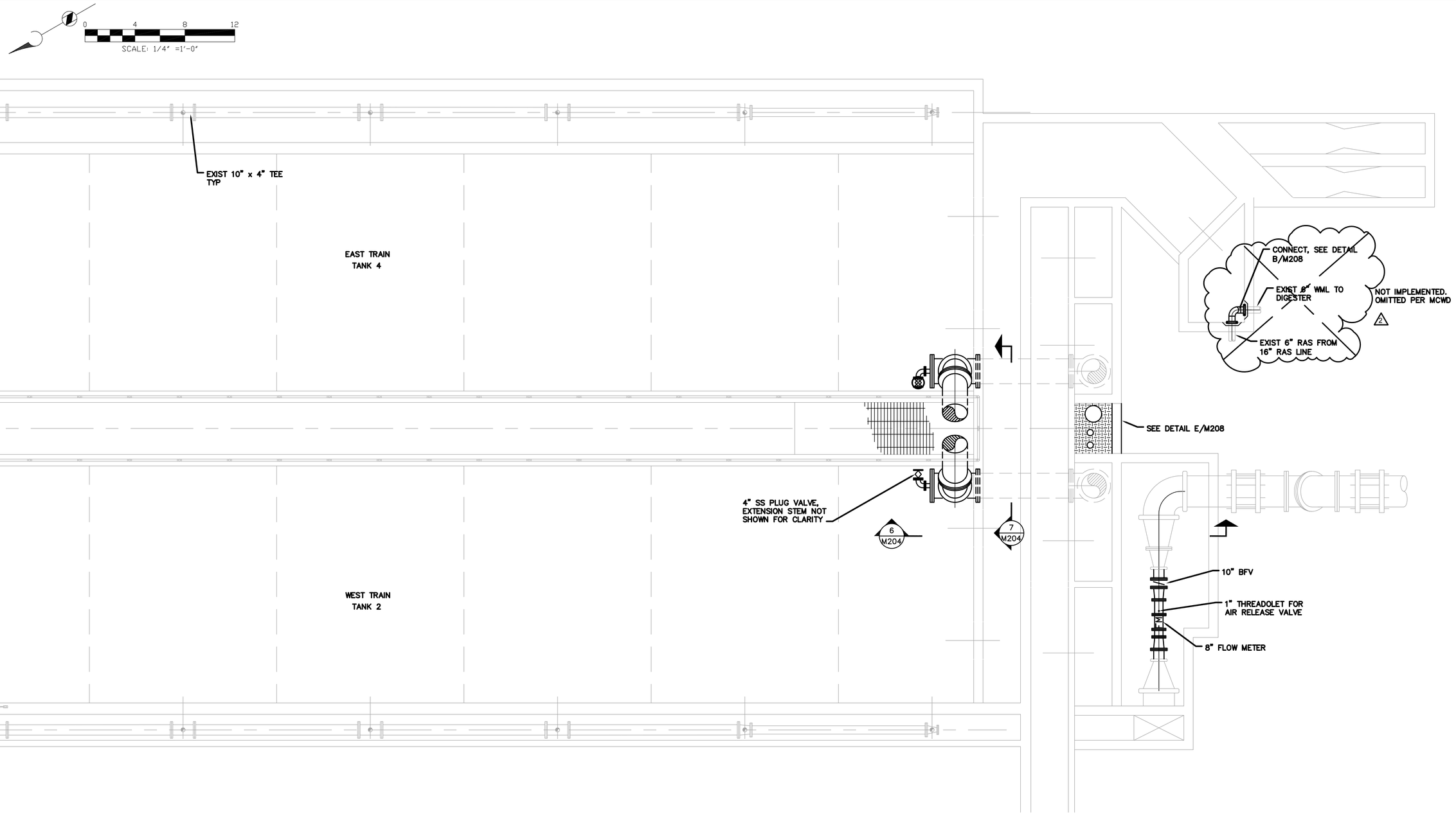
MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

AERATION BASIN PLAN - 1

SCALE 1/4" 1'-0"
DRAWING NUMBER M201
SHEET NUMBER 19 OF 33

DWG: \\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities\WWTP\Phase II\12905-X-AB-MECH-PLAN 12905-X-AERATION-BASIN 12905-X-TBLK XREFS: USER: nholt
DATE: Jun 16, 2026 3:07pm



RECORD DRAWING

This Record Drawing has been prepared based on information provided by others. HDR Engineering Inc. has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions that may be incorporated herein as a result.

Signed: _____ **Date:** _____

HDR/CGvL
26250 ENTERPRISE COURT, SUITE 150
LAKE FOREST, CALIFORNIA 92630
(949)-454-4800 Fax(949)454-4801

SUBMITTED JUAN JOSSE PROJECT MANAGER DATE: _____
APPROVED JAMES CATHCART PINCIPAL-IN-CHARGE DATE: _____
APPROVED _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY: _____

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	JUAN JOSE	05/02/05	
	2	**RECORD DRAWING**	**06/10/06**	

MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

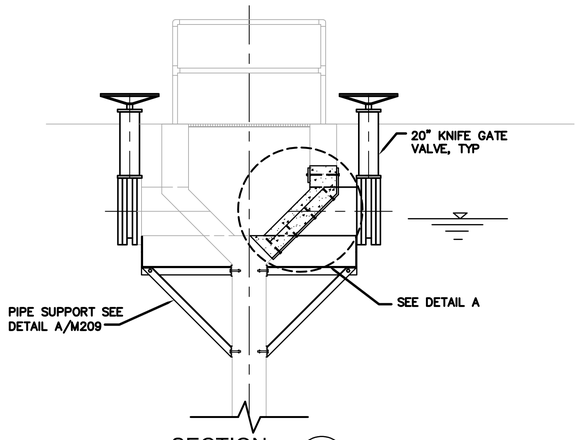
AERATION BASIN PLAN - 2

SCALE: 1/4" 1'-0"

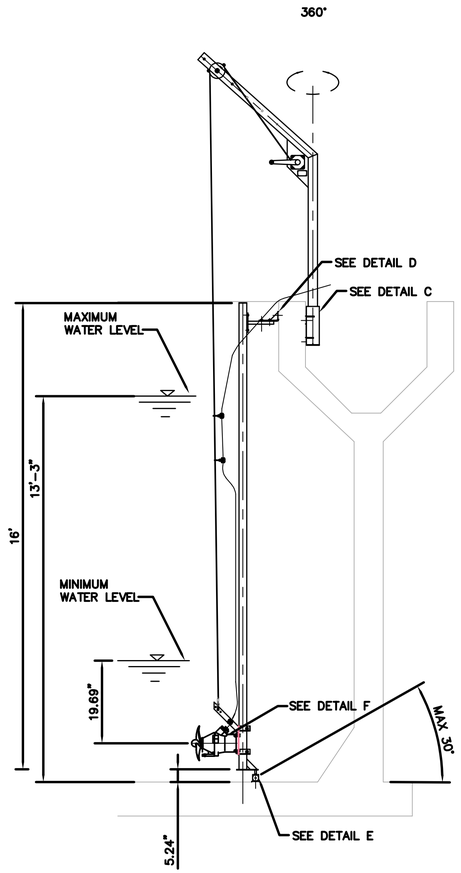
DRAWING NUMBER: M202

SHEET NUMBER: 20 OF 33

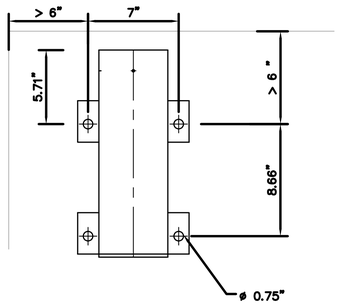
DWG: \\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities WWTP\Phase II\12905-2202-R.dwg USER: rholt
\\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities WWTP\Phase II\12905-X-AB-MECH-PLAN
\\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities WWTP\Phase II\12905-X-AERATION-BASIN



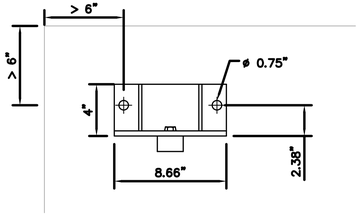
SECTION 3 M201
SCALE: 3/8"=1'-0"



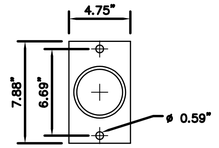
DETAIL B M201
SCALE: 1/8"=1'-0"



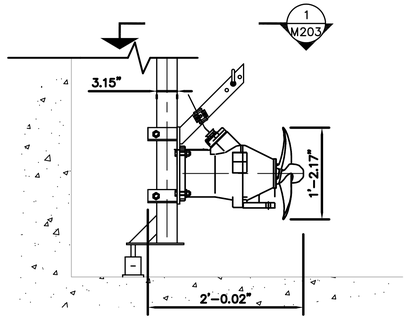
DETAIL C M203
SCALE: 2"=1'-0"



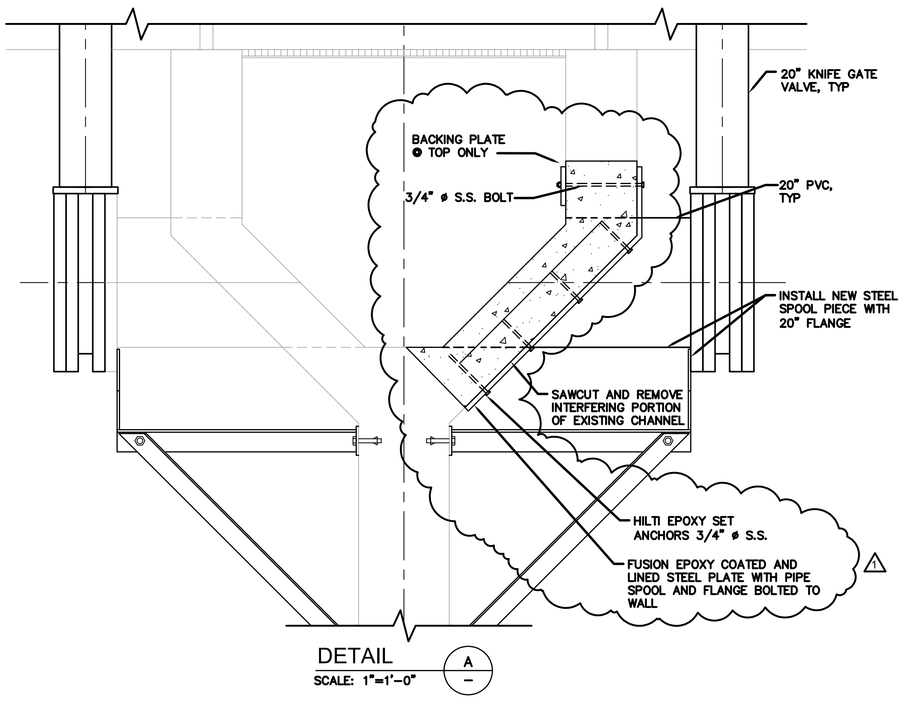
DETAIL D M203
SCALE: 2"=1'-0"



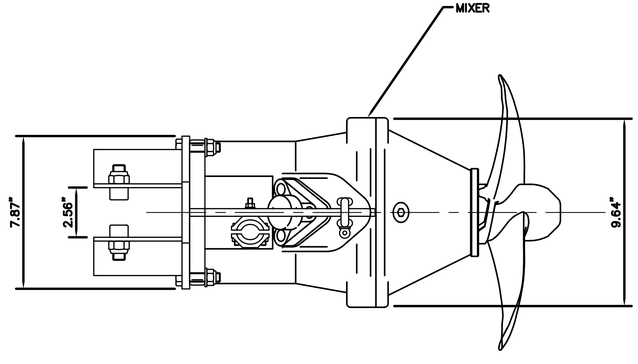
DETAIL E M203
SCALE: 2"=1'-0"



DETAIL F M203
SCALE: 1"=1'-0"



DETAIL A —
SCALE: 1"=1'-0"



SECTION 1 M203
SCALE: 3"=1'-0"

RECORD DRAWING

This Record Drawing has been prepared based on information provided by others. HDR Engineering Inc. has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions that may be incorporated herein as a result.

Signed: _____ **Date:** _____

HDR/CGvL
26250 ENTERPRISE COURT, SUITE 150
LAKE FOREST, CALIFORNIA 92630
(949)-454-4800 Fax(949)454-4801

SUBMITTED JUAN JOSSE (PROJECT MANAGER) DATE: _____
APPROVED JAMES CATHCART (PRINCIPAL-IN-CHARGE) DATE: _____
APPROVED _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY: _____

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	RECORD DRAWING	02/09/07	

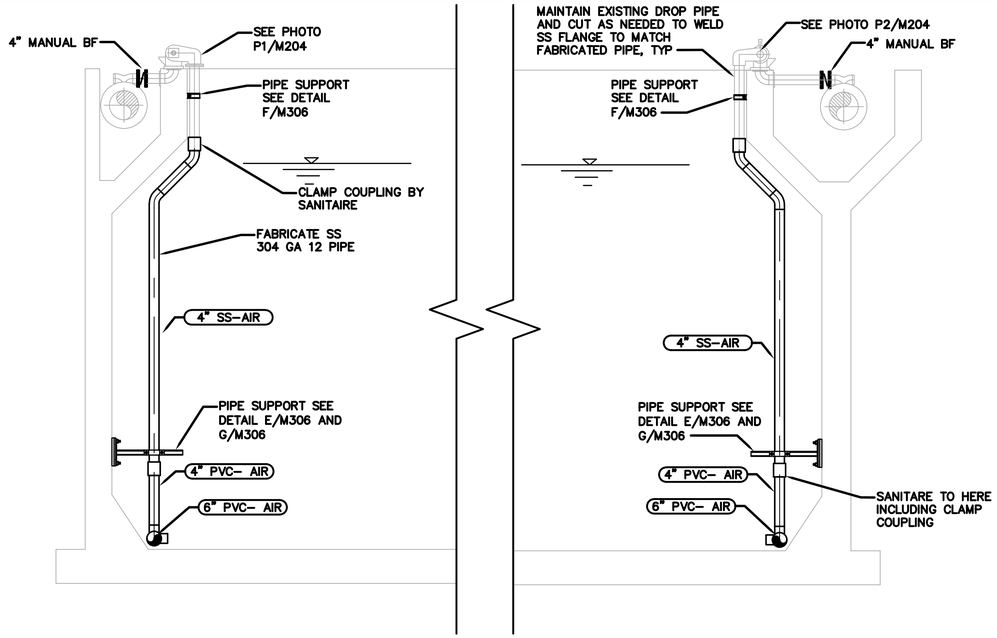
MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

AERATION BASIN SECTIONS AND DETAILS - 1

SCALE: AS SHOWN
DRAWING NUMBER: M203
SHEET NUMBER: 21 OF 33

DWG: \\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities\WWTP\Phase II\12905-X-AERATION-BASIN\12905-X-AERATION-BASIN-SECT-R2203-R.dwg USER: rholt
DATE: Jun 16, 2026 4:32pm XREFS: 12905-X-TBLK



SECTION 1 / M201
SCALE: 3/8"=1'-0"

SECTION 2 / M201
SCALE: 3/8"=1'-0"

P:\129\05\Phase II\12905-DropLeg1.JPG

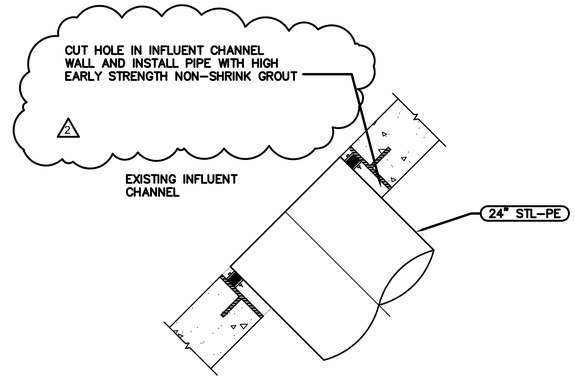
WEST TANK - DROP LEG SWING ELBOW, TYP

PHOTO P1 / M204
NO SCALE

P:\129\05\Phase II\12905-Basin3airdrop_1.JPG

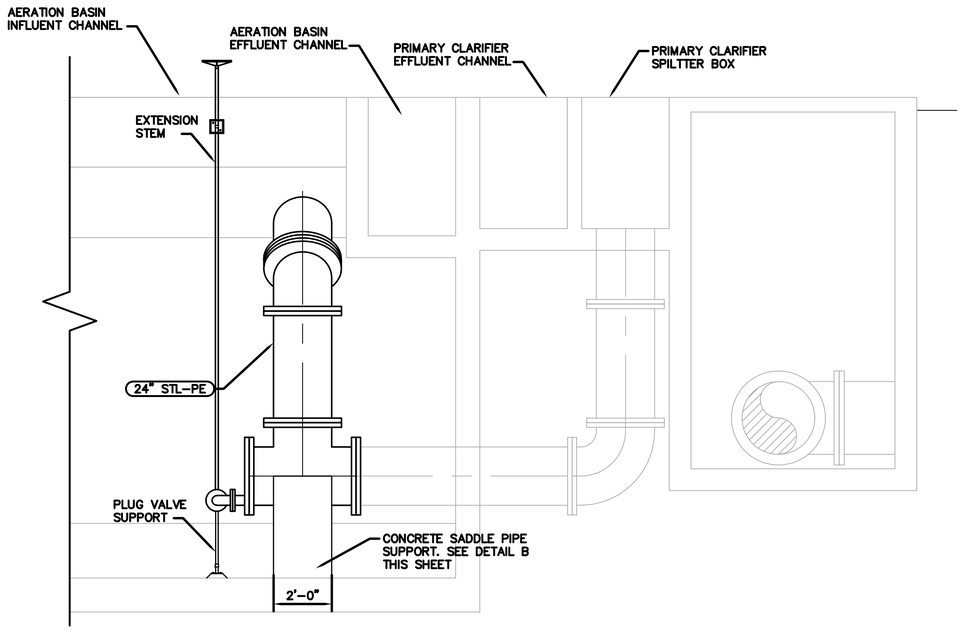
EAST TANK - DROP LEG SWING ELBOW, TYP

PHOTO P2 / M204
NO SCALE

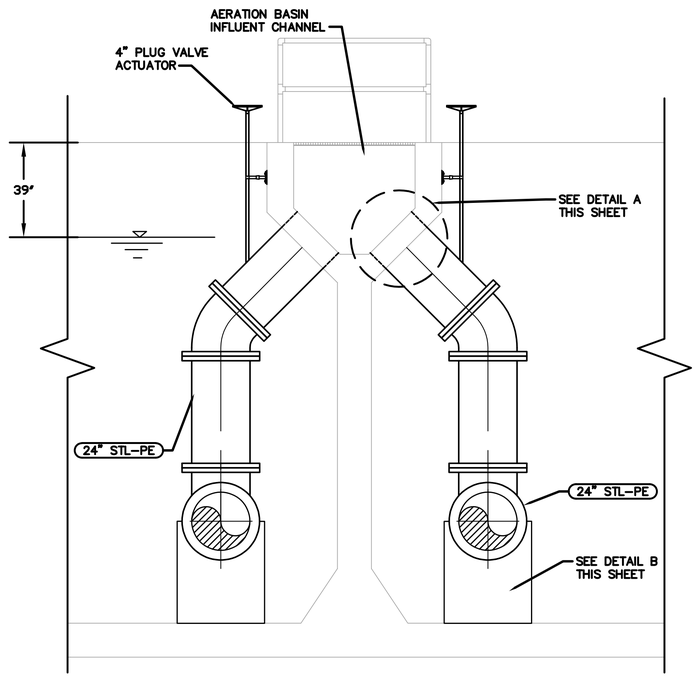


INFLUENT CHANNEL WALL PIPE PENETRATION

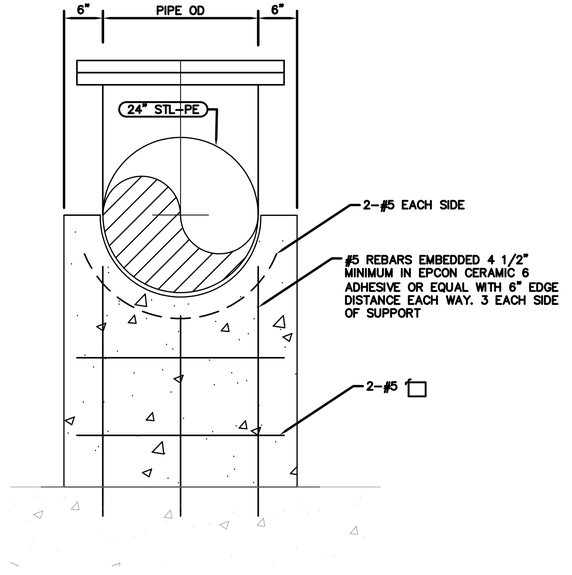
DETAIL A / –
SCALE: 1"=1'-0"



SECTION 6 / M202
SCALE: 3/8"=1'-0"



SECTION 7 / M202
SCALE: 3/8"=1'-0"



CONCRETE SADDLE PIPE SUPPORT

DETAIL B / –
SCALE: 1"=1'-0"

RECORD DRAWING

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Signed: _____ **Date:** _____

HDR/CGvL
26250 ENTERPRISE COURT, SUITE 150
LAKE FOREST, CALIFORNIA 92630
(949)-454-4800 Fax(949)454-4801

SUBMITTED JUAN JOSSE (PROJECT MANAGER) DATE:
APPROVED JAMES CATHCART (PRINCIPAL-IN-CHARGE) DATE:
APPROVED DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY:

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1		02/28/05	
	2	RECORD DRAWING	02/09/07	

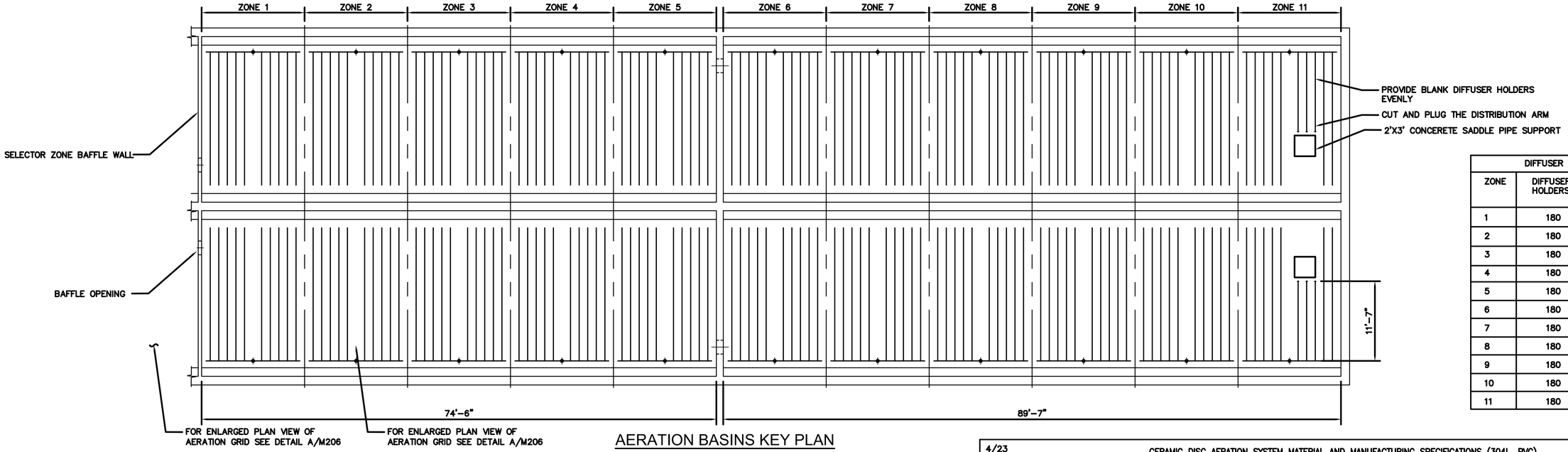
MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

AERATION BASIN SECTIONS AND DETILS - 2

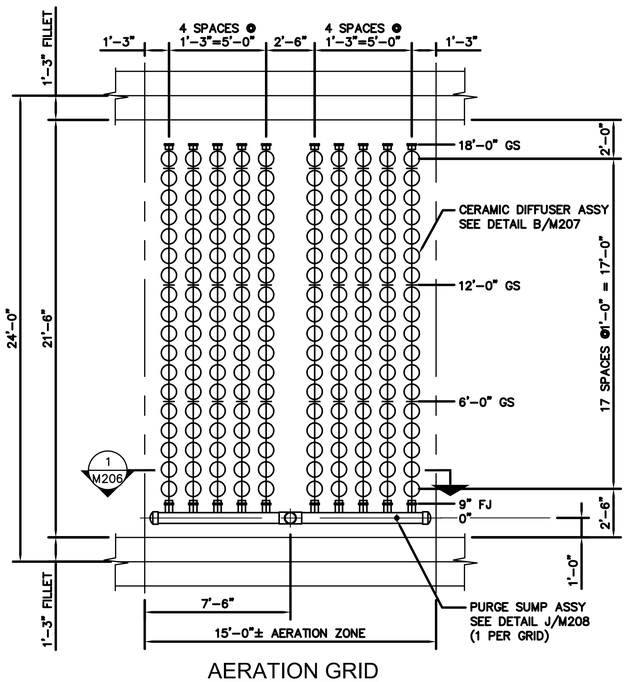
SCALE: AS SHOWN
DRAWING NUMBER: M204
SHEET NUMBER: 22 OF 33

DWG: \\mcwdsvr12\WCWD Engineering\Projects\Sewer Facilities\WWTP\Phase II\12905-M204-R.dwg USER: rholt
DATE: Jun 16, 2026 4:35pm XREFS: 12905-X-TBLK | 12905-X-AERATION-BASIN | 12905-X-AB-MECH-PLAN



AERATION BASINS KEY PLAN

DIFFUSER ARRANGEMENT			
ZONE	DIFFUSER HOLDERS	BLANK DIFFUSER HOLDERS	CERAMIC DIFFUSERS
1	180	0	180
2	180	0	180
3	180	0	180
4	180	40	140
5	180	40	140
6	180	40	140
7	180	60	120
8	180	60	120
9	180	60	120
10	180	60	120
11	180	60	120



AERATION GRID DETAIL A M206
SCALE: 1/4"= 1'-0"

LEGEND

GS – GUIDE SUPPORT, SEE DETAIL F/M207

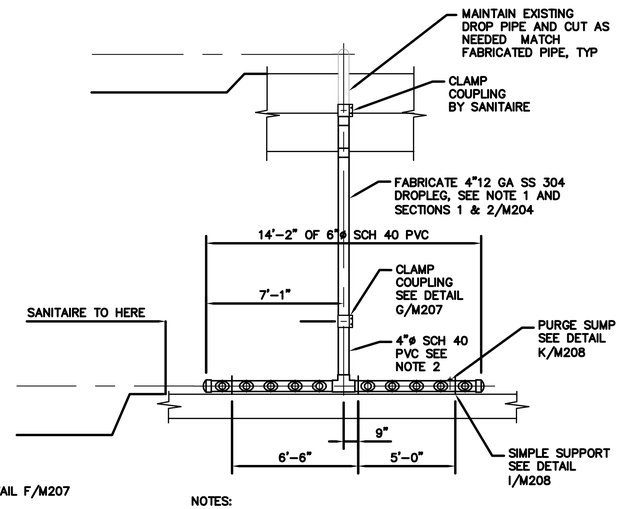
FJ – FIXED JOINT, SEE DETAIL C/M207

FOR TYPICAL AIR DISTRIBUTER SECTION SEE DETAIL H/M207

AERATION GRID INFORMATION

2 – TANK(S)
11 – GRID(S) PER TANK
10 – AIR DISTRIBUTORS PER GRID
18 – DIFFUSERS PER AIR DISTRIBUTOR
180 – DIFFUSERS PER GRID
3960 – TOTAL DIFFUSERS INSTALLED FOR THIS GRID TYPE

DETAIL A A M201 M202
SCALE: 1/8"= 1'-0"



NOTES:
1. INSTALLATION OF THE DROPLEG REQUIRES A PROPERLY SUPPORTED AIR MAIN AND CONNECTION.
2. PVC DROPLEG WILL BE SHIPPED TO JOBSITE 6" LONGER THAN REQUIRED, TO ACCOUNT FOR TANK VARIANCES. CONTRACTOR TO CUT TO SUIT AND SOLVENT WELD INTO MANIFOLD TO MAINTAIN 1/8" MAX GAP BETWEEN STAINLESS STEEL AND PVC DROPLEGS.

DROPLEG / MANIFOLD SECTION 1 M206
SCALE: 1/4"= 1'-0"

4/23 CERAMIC DISC AERATION SYSTEM MATERIAL AND MANUFACTURING SPECIFICATIONS (304L, PVC)

ITEM	MATERIAL SPECIFICATION	MANUFACTURING SPECIFICATION	NOTES
DROPLEG	304L STAINLESS STEEL ASTM A240	FITTINGS: ASTM A774 TUBULAR PRODUCTS: ASTM A778 DIMENSIONS: ASTM A554	150# DRILLING FOR TERMINATION FLANGE CONNECTION. 12 GAUGE PIPE (0.109") WALL THICKNESS ON DROPLEG. *SEE BELOW
SUPPORTS	304L STAINLESS STEEL SHEETS & PLATES PER ASTM A240 THREADED ROD PER ASTM A276	———	"L" GRADE NOT REQUIRED FOR NON–WELDED PARTS
BOLTS, NUTS, WASHERS	18–8 STAINLESS STL	———	———
FIXED JOINT O–RING	NATURAL RUBBER/SBR	———	45 ± 5 DUROMETER SHORE A COMPRESSION SET 5% MAX
DIFFUSER HOLDER O–RING	POLYISOPRENE	———	40 ± 5 DUROMETER SHORE A 500% ELONGATION
LOWER DROPLEG & MANIFOLD	PVC, ASTM D1784 COMPOUND 12454–B	PIPE: ASTM D1785 FITTINGS: ASTM D2466	———
AIR DISTRIBUTORS	PVC, ASTM D3915 COMPOUND 124524	PIPE: ASTM D3034 FITTINGS: ASTM D3034	MINIMUM 2% TITANIUM DIOXIDE
DIFFUSER HOLDER, RETAINING RING	PVC, ASTM D3915 COMPOUND 124524	———	MINIMUM 2% TITANIUM DIOXIDE
DIFFUSER ELEMENT	FUSED ALUMINA	———	———
PVC SOLVENT WELDING	ASTM D2564	ASTM D2855	———

*STAINLESS STEEL DROPLEG FABRICATION
FACTORY WELD ONLY WITH MIG, TIG, OR PLASMA–ARC WELDING INERT GAS PROCESSES, FULL PENETRATION BUTT WELDS, ER 316L FILLER WIRE. AFTER FABRICATION FINISH CLEAN ALL WELDED STAINLESS STEEL ASSEMBLIES BY FULL IMMERSION CLEANING TECHNIQUES IN ACCORDANCE TO 6.2.11 OF ASTM A380–88. THE ACID FOR USE DEFINED BY TABLE A2.1 OF ANNEX A2 OF ASTM A380. FINAL RINSE AND DRY IN ACCORDANCE TO SECTION 8.3 OF ASTM A380. ALL WELDED SURFACES TO CONFORM TO AISI NO. 2D FINISH.

RECORD DRAWING

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Signed: _____ **Date:** _____

HDR/CGvL
26250 ENTERPRISE COURT, SUITE 150
LAKE FOREST, CALIFORNIA 92630
(949)-454-4800 Fax(949)454-4801

SUBMITTED JUAN JOSSE PROJECT MANAGER DATE:
APPROVED JAMES CATHCART PINCIPAL-IN-CHARGE DATE:
APPROVED DATE:

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY:

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APP.
	1	RECORD DRAWING	06/10/06	

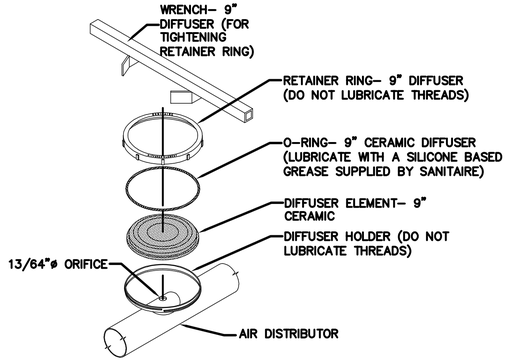
MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

AERATION BASIN DIFFUSER DETAILS 1

SCALE: AS SHOWN
DRAWING NUMBER: M205
SHEET NUMBER: 23 OF 33

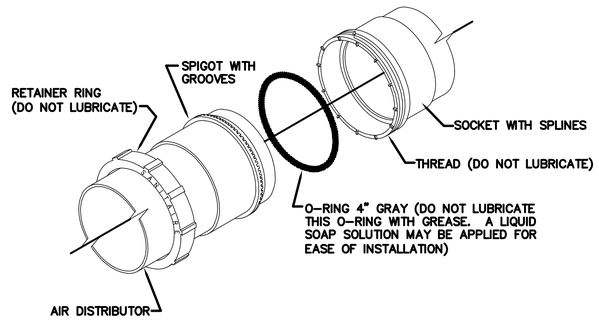
DATE: Jun 16, 2006 4:36pm \\Pwdata\proj\Mammoth_Engineering\129005\Projects\Sewer Plant\129005-A-TBLK XREFS: 129005-A-TBLK



CERAMIC DIFFUSER ASSEMBLY

DETAIL B M206

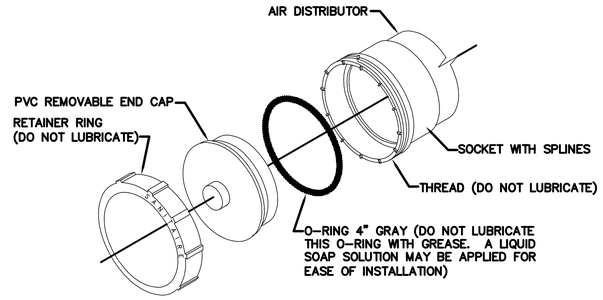
SCALE: NONE



FIXED JOINT

DETAIL C M206

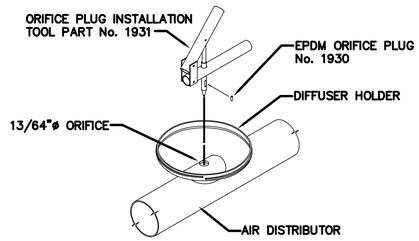
SCALE: NONE



PVC REMOVABLE END CAP

DETAIL D M206

SCALE: NONE

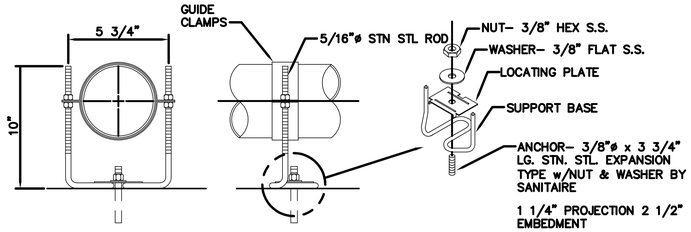


1. FOR ALL "BLANK" DIFFUSER HOLDERS (DIFFUSER HOLDERS WHICH DO NOT REQUIRE DIFFUSERS.)
2. LUBRICATE ORIFICE PLUGS WITH A LIQUID SOAP SOLUTION.
3. INSERT ORIFICE PLUG INTO INSTALLATION TOOL TROUGH SLOT IN BARREL OF TOOL.
4. PRESS TIP OF BARREL INTO ORIFICE HOLE AND FULLY DEPRESS HANDLE.
5. AFTER PLUG IS INSERTED, ROTATE TOOL TO SIDE WHILE PULLING SLIGHTLY. PLUG SHOULD BE FIRMLY SEATED INTO ORIFICE.
6. PLUGS MAY BE REMOVED WITH PLIERS.

BLANK DIFFUSER HOLDER

DETAIL E M206

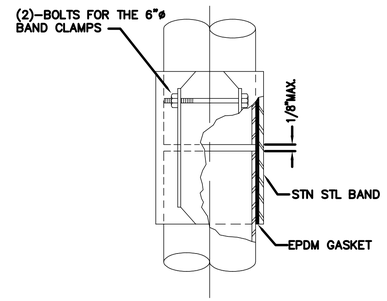
SCALE: NONE



GUIDE SUPPORT

DETAIL F M206

SCALE: NONE

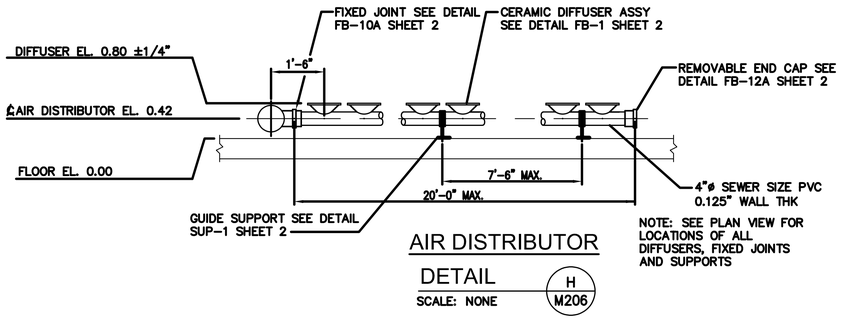


NOTE:
TORQUE NUTS TO 50–55 FT.LBS

CLAMP COUPLING

DETAIL G M206

SCALE: NONE



NOTE: SEE PLAN VIEW FOR LOCATIONS OF ALL DIFFUSERS, FIXED JOINTS AND SUPPORTS

AIR DISTRIBUTOR

DETAIL H M206

SCALE: NONE

RECORD DRAWING

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APPROVED DATE:

LINE IS 2 INCHES AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY:

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	RECORD DRAWING	06/10/06	

MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

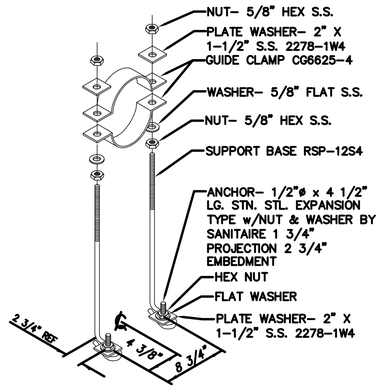
AERATION BASIN DIFFUSER DETAILS - 2

SCALE: AS SHOWN

DRAWING NUMBER: M206

SHEET NUMBER: 24 OF 33

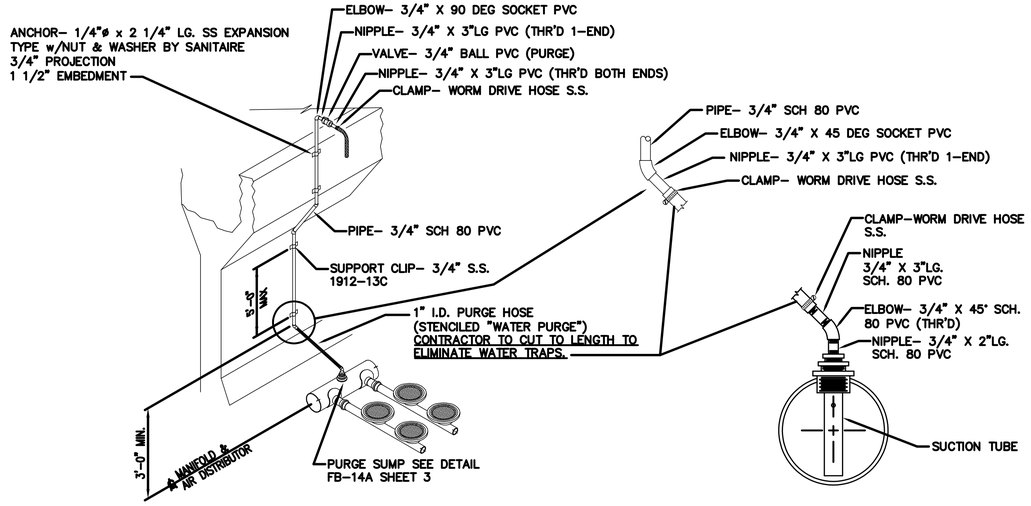
USER: mhoit
PLOTTED: Jun 16, 2006 - 4:41pm
XREFS: 12905-X-TBLK
DWG: \\mcwd3\mcwd\Engineering\Projects\Sewer Projects\2005 WWTP Phase II\12905-X-TBLK.dwg



SIMPLE SUPPORT

DETAIL I / M206

SCALE: NONE



PURGE SUMP ASSY

DETAIL J / M206

SCALE: NONE

PURGE SUMP

DETAIL K / M206

SCALE: NONE

RECORD DRAWING

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APPROVED JAMES CATHCART (PRINCIPAL-IN-CHARGE) DATE:
APPROVED DATE:

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FILE NUMBER: 129–05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY:

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	RECORD DRAWING	06/10/06	

MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

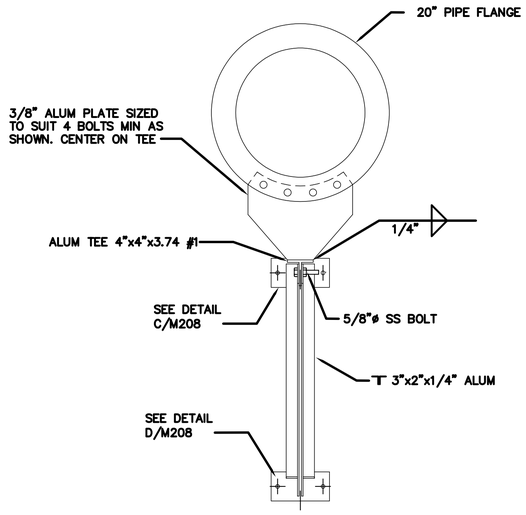
AERATION BASIN DIFFUSER DETAILS - 3

SCALE: AS SHOWN

DRAWING NUMBER: M207

SHEET NUMBER: 25 OF 33

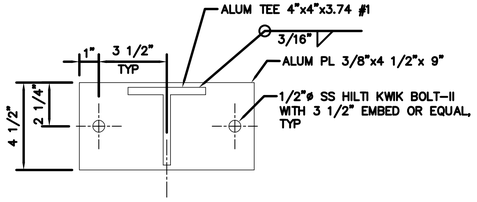
DATE: Jun 16, 2026 4:49pm XREFS: 12905-X-TBLK



RAS INFLUENT PIPE SUPPORT

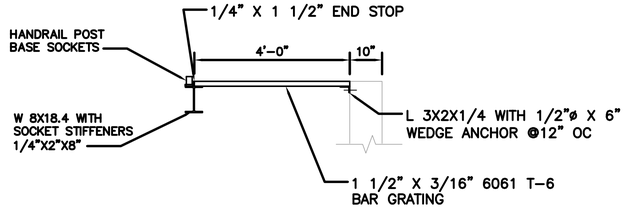
DETAIL A / M208

SCALE: 1"=1'-0"



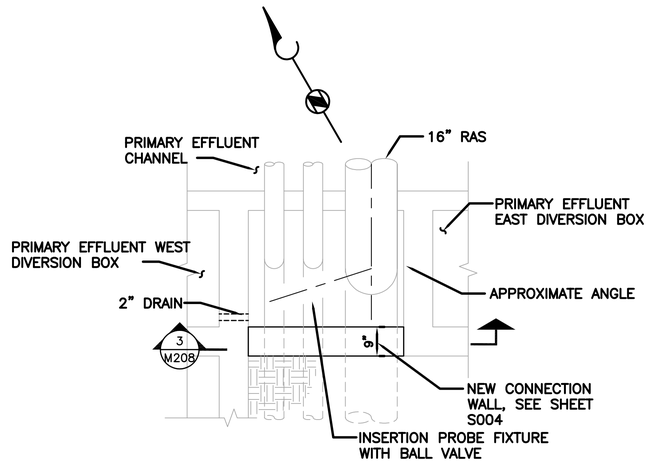
DETAIL C / M208

SCALE: 3"=1'-0"



SECTION 9 / M201

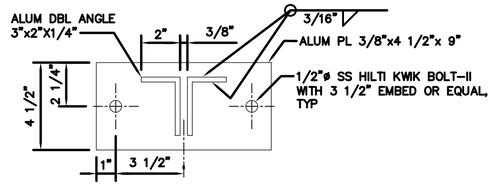
SCALE 1/2" =1'



NOTE:
CONTRACTOR TO FIELD VERIFY ALIGNMENT OF THE EXISTING PIPES TO DECIDE THE INSTALLATION ANGLE OF THE INSERTION PROBE.

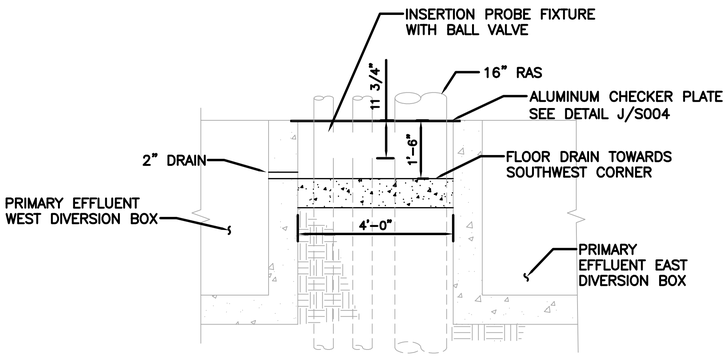
DETAIL E / M202

SCALE 1/2" = 1'



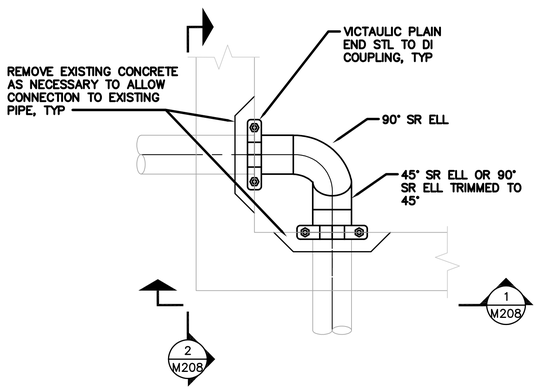
DETAIL D / M208

SCALE: 3"=1'-0"



SECTION 3 / M208

SCALE 1/2" =1'

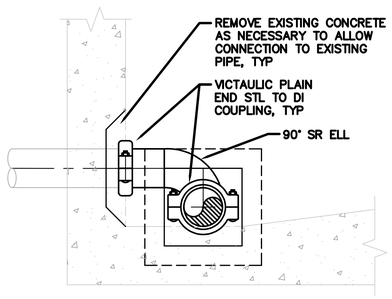


RAS-WML CONNECTION

DETAIL B / M208

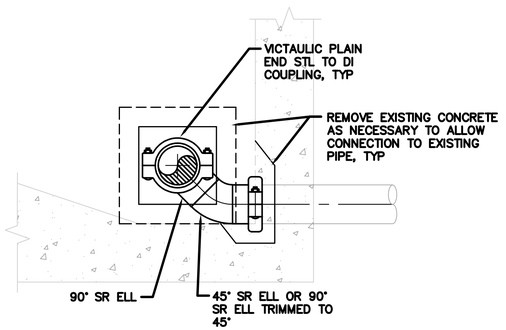
SCALE: 1"=1'-0"

NOTE:
CONTRACTOR TO FIELD VERIFY ALIGNMENT AND INVERT ELEVATIONS PRIOR TO FABRICATION



SECTION 1 / M208

SCALE: 1"=1'-0"



SECTION 2 / M208

SCALE: 3"=1'-0"

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(949)-454-4800 Fax(949)454-4801

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APPROVED	JAMES CATHCART, PINCIPAL-IN-CHARGE	DATE:
APPROVED		DATE:

LINE IS 2 INCHES AT FULL SIZE
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FILE NUMBER:	129-05
DESIGNED BY:	JJ
DRAWN BY:	CB/SS/DG
CHECKED BY:	

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APP.
	1	JUAN JOSE	05/02/05	
	2	JUAN JOSE	06/02/05	
	3	RECORD DRAWING	02/09/07	

MAMMOTH COMMUNITY WATER DISTRICT

WASTEWATER TREATMENT PLANT UPGRADE - PHASE II

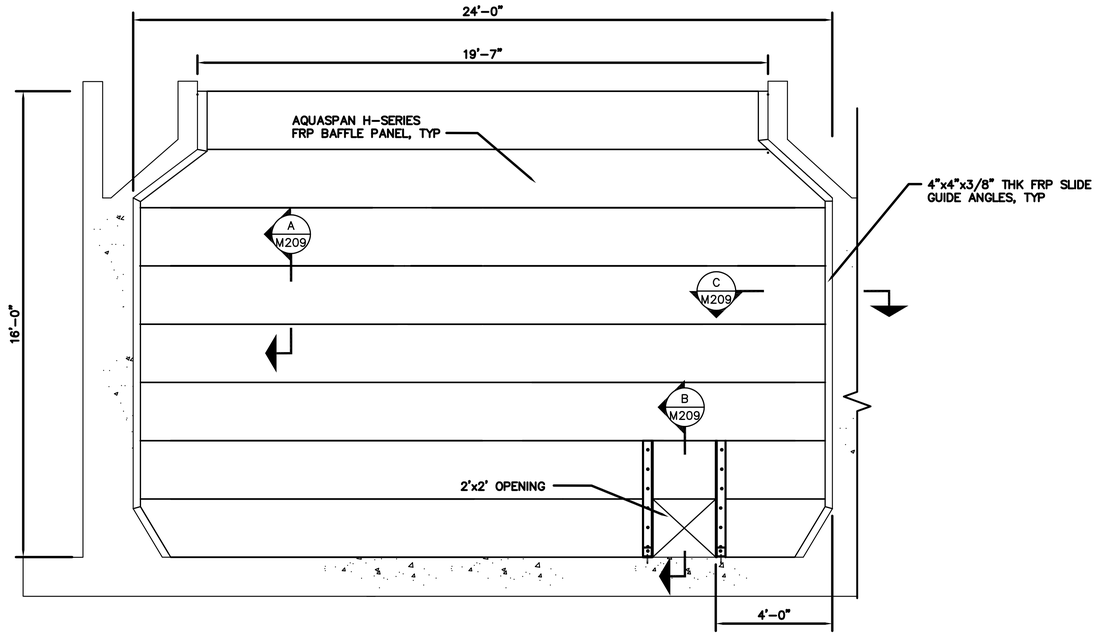
AERATION BASIN MECHANICAL DETAILS

SCALE: AS SHOWN

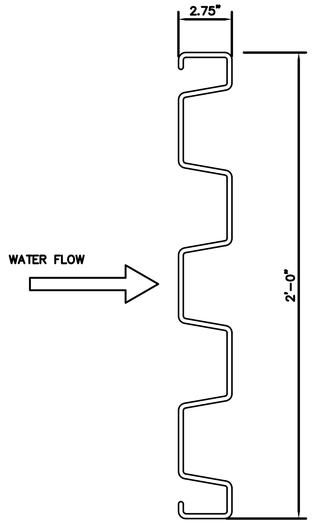
DRAWING NUMBER: M208

SHEET NUMBER: 26 OF 33

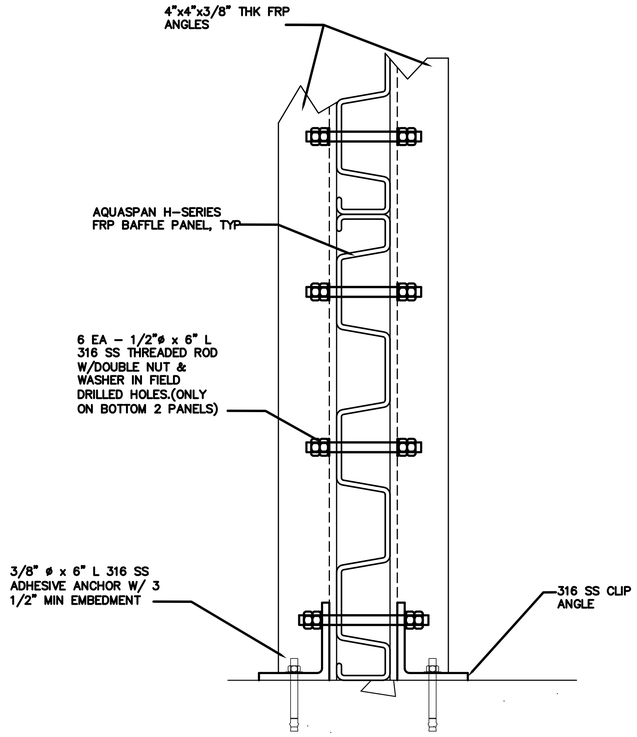
DATE: Jun 16, 2026 4:56pm \\mwdfs\Engineering\Projects\Sewer Submittal\Influent Hose #1\12905-X-AB-MECH-PLAN Influent Hose #1.dwg
XREFS: 12905-X-TBLK
12905-X-AB-MECH-PLAN



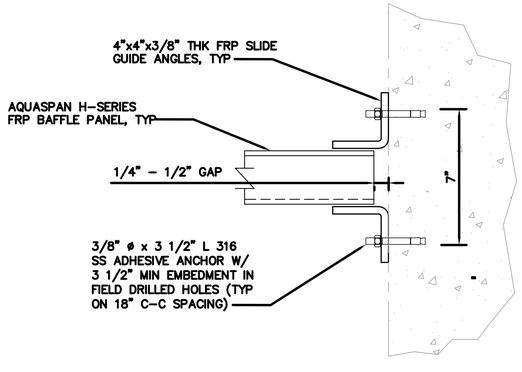
SECTION 8/M201
SCALE: 3/8"=1'-0"



DETAIL A/M209
SCALE: 3"=1'-0"



DETAIL B/M209
SCALE: 3"=1'-0"



DETAIL C/M209
SCALE: 3"=1'-0"

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APPROVED DATE:

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(IF NOT 2"-SCALE ACCORDINGLY)

FILE NUMBER: 129-05
DESIGNED BY: JJ
DRAWN BY: CB/SS/DG
CHECKED BY:

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APP.
	1	**RECORD DRAWING**	**06/10/06**	

MAMMOTH COMMUNITY
WATER DISTRICT

WASTEWATER TREATMENT
PLANT UPGRADE - PHASE II

AERATION BASIN
SELECTOR ZONE BAFFLES

SCALE: AS SHOWN
DRAWING NUMBER: M209
SHEET NUMBER: 27 OF 33

DWG: \\mcwdsvr12\MCWD Engineering\Projects\Sewer Facilities\WWTP\Phase II\12905-X-AERATION-BASIN\12905-X-TBLK XREFS: 12905-X-AERATION-BASIN-SECT 12905-X-AERATION-BASIN-M209-R.dwg USER: rholt
DATE: Jun 16, 2026 5:02pm

18"ϕ Filtered Water (From Filters)

18"ϕ Secondary Effluent (To Filter Pumps)

18"-45° ELL

3/4" H.V.

Grating See Std. Det. (B/M-3)

Effluent Flow Meter See Sheet M-5 for Details

SECONDARY

CLARIFIERS

Drive Openings per Mfr.

Scrap Chain: (2) See Detail Sheet M-10

Effluent Launders See Detail (2/M-3)

Handrail @ Std. Spacing (Typ.) See Detail Sheet M-8

Skylight & Access Hatch

MECH. BLDG. See Sheets M-17 to 19

RAS Pump Rm (Below) See Sheet M-15

Cap

3/4" H.V. See Det. (1/M-16)

1" SAMPLE, PVC SCH 80

SLOPE @ 6%

12"ϕ Filtered Water ℄ El. 47.75

10"-45° ELL

4"ϕ Effluent Water ℄ Elev. 50.25

18"ϕ Balancing Line ℄ Elev. 46.25

1½" G.V. (Typ.)

Stop Gate Type "B" See Det. (4/M-9)

2" F.S. w/ Nozzles @ 4'-0" o.c., ℄ El. 53.25

Handrailing @ Std. Spacing (Typ.)

2½"ϕ Air

CHLORINE

2" ϕ E.W. ℄ El. 53.25

Grating ℄ & Downpipe No. 1

CONTACT TANK

1½"ϕ Flex. Airline

Grating, See Std. Detail (2/M-7)

℄ Downpipe No. 1

Floating Skimmer (Typ.)

16"x 12"x 5'-0" Weir @ 12'-0" o.c.

3/4" H.V.

Temp. Cap (Typ.)

3"ϕ Skimmings (2 cl.) (To Barminutor Channel)

Temp. Cap

4"ϕ EFF. WATER

18"ϕ Effluent (To Percolation Area)

PLAN

1/4" = 1'-0"

Collector Mechanism Drive

Slab El. 54.00

6"ϕ R.S. ℄ Elev. 50.75

1"ϕ E.W.

RAS PUMP RM. SEE SHT. M-15

MECH. BLDG. - PUMP ROOM

Opening per Manufacturers Specs

K.I.S. Elev. 51.10

Effluent Launders (Typ) See Detail (2/M-3)

Top of Weir Elev. 52.25

Idler Sprocket

Upper Flight Return Track Shall Be Adjustable Setting Top of Flight Between Elev. 51.25 and Elev. 51.45

Flight return rails (Furnished by Equipment Mfr.)

18"-45° ELL

18"ϕ Secondary Effluent ℄ Elev. 46.25

Front turn Shaft

El. 40.95

Elev. 40.25

20" Tee Rail - Set top 3/16" Above Conc. Surface

El. 38.00

18"ϕ to Filter Pumps ℄ El. 38.75 C.I. RAS

℄ Elev. 42.42

Elev. 31.25

18" Eq.

SECTION (A/—)

1/4" = 1'-0"

Handrail @ Std. Spacing (Typ.)

3"ϕ Skimmings ℄ El. 52.00

3"ϕ Air

2"ϕ F.S.

2"ϕ E.W.

Floating Skimmer

2"ϕ Air Lift See Det. (4/M-9)

Idler Sprocket

12" Skim Line

Back Turn Shaft

Elev. 49.25

18"ϕ Effluent (Not Shown in This View)

Top of Weir Elev. 51.70 16"ϕ R.B.E. 12" o.c., ℄ Elev. 49.50

1" SAMPLE

18"ϕ To R.A.S. Pump Reservoir ℄ Elev. 47.15

4" Effluent Water ℄ Elev. 47.50

Grating

8'-0" Stop Gate, Type "B" See Sht. M-9

3"ϕ Skimmings

Elev. 53.75

Floating Skimmer See Det. (5/M-9) (Typ.)

SECTION (C/—)

1/4" = 1'-0"

Fillet as req'd by Mfr.

Elev. 49.50

Effluent Flow Meter See Detail, Sheet M-5

Elev. 49.45

18"ϕ Sec. Effluent

Elev. 45.50

18"ϕ to Hatching Pond

SECTION (B/—)

1/4" = 1'-0"

REVISIONS			
No.	Date	Description	By

JOB NO. 200

Drawn b.c. Date 4/27.71

Chk'd DFP Date 7/30/71

RCE 13512 Date 7/30/71

Approved

MOLINA engineering consultants, inc.

PLANNING • ENVIRONMENTAL SYSTEMS • RESEARCH

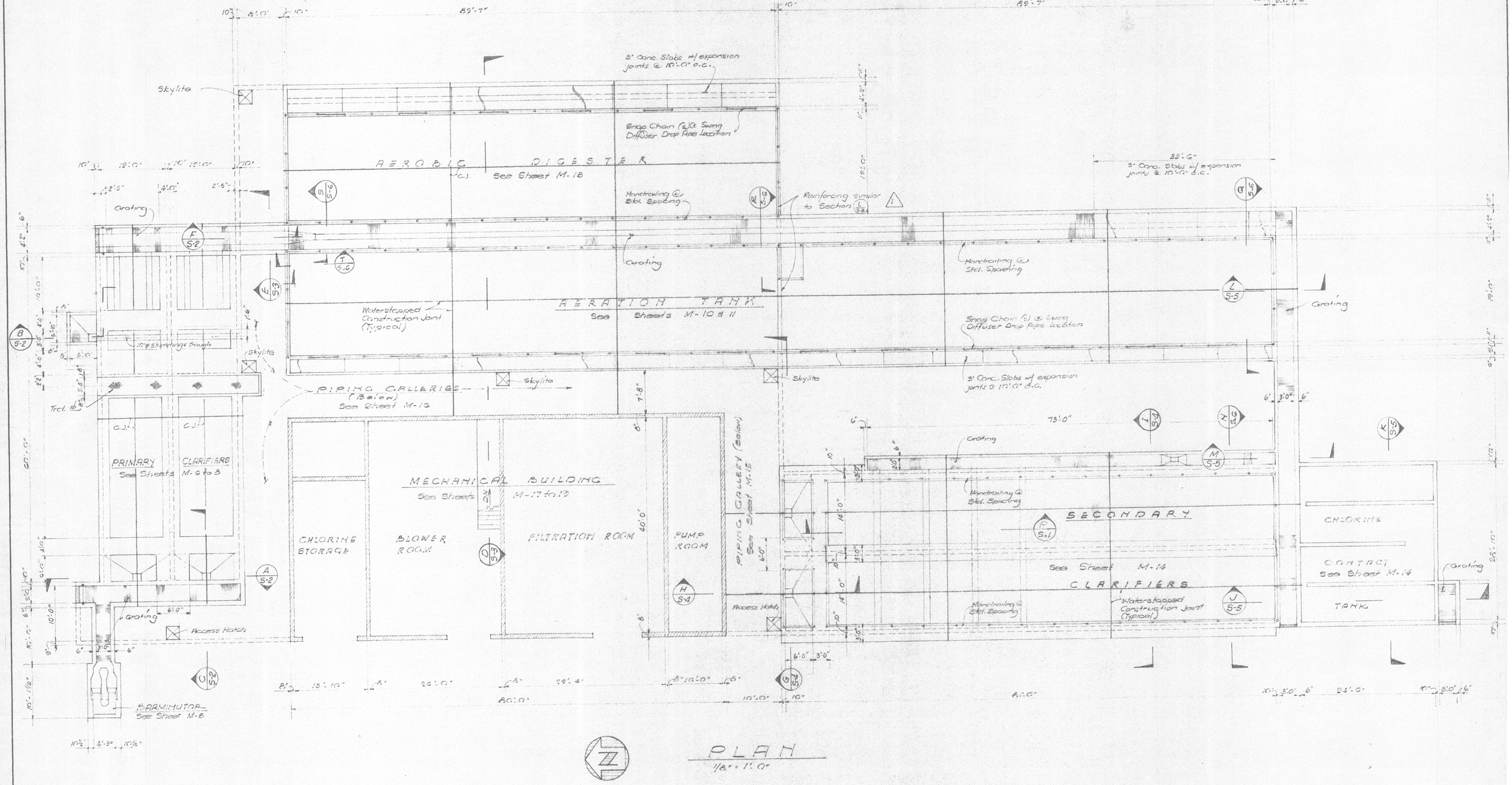
West Covina, California

MAMMOTH COUNTY WATER DISTRICT

SECONDARY CLARIFIERS - PLAN & SECTION

SHEET M-14 OF 19

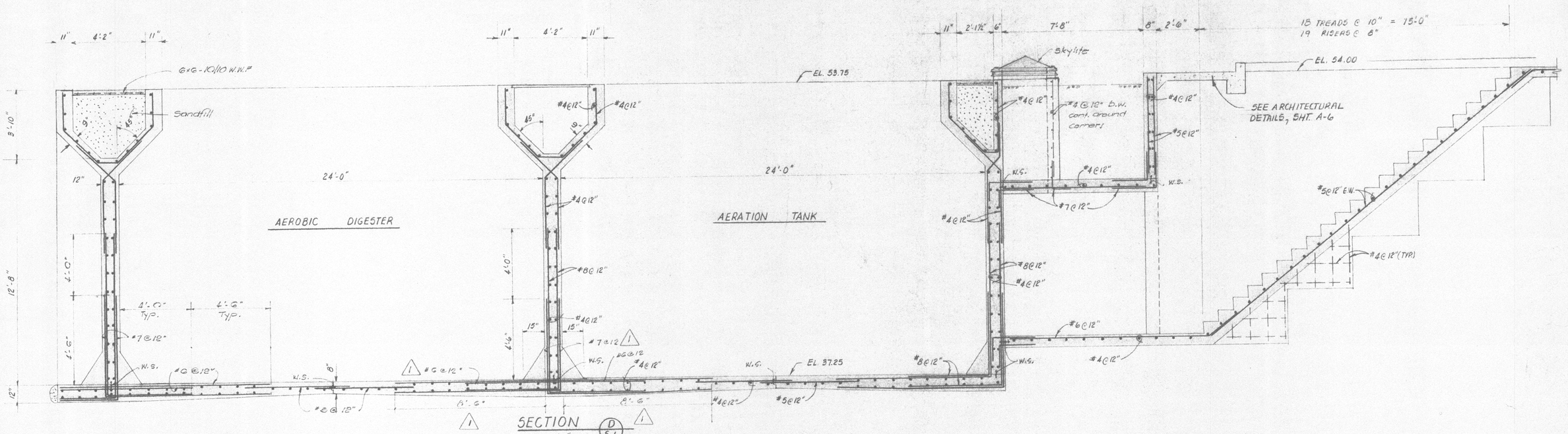
DIETZGEN POST-CLEARPRINT 1020



PLAN

1/8" = 1'-0"

REVISIONS				JOB NO. 200			MOLINA engineering consultants, inc.	MAMMOTH COUNTY WATER DISTRICT	SHEET S-1
No.	Date	Description	By	Drawn BC	Date 4-25-71		PLANNING • ENVIRONMENTAL SYSTEMS • RESEARCH	STRUCTURAL PLAN	OF 7
1	11/10/71	Revised per Addendum No.1	BC	Chk'd DFP	Date 7/30/71	RCE 18512 Date 7/30/71 Approved			



REVISIONS			
No.	Date	Description	By
1	11/29/71	Revised per addendum No 2	BC

JOB NO. 1200
Drawn UNO Date 4/27/71
Chk'd DFP Date 7/30/71
RCE 13512 Date 7/30/71
Approved

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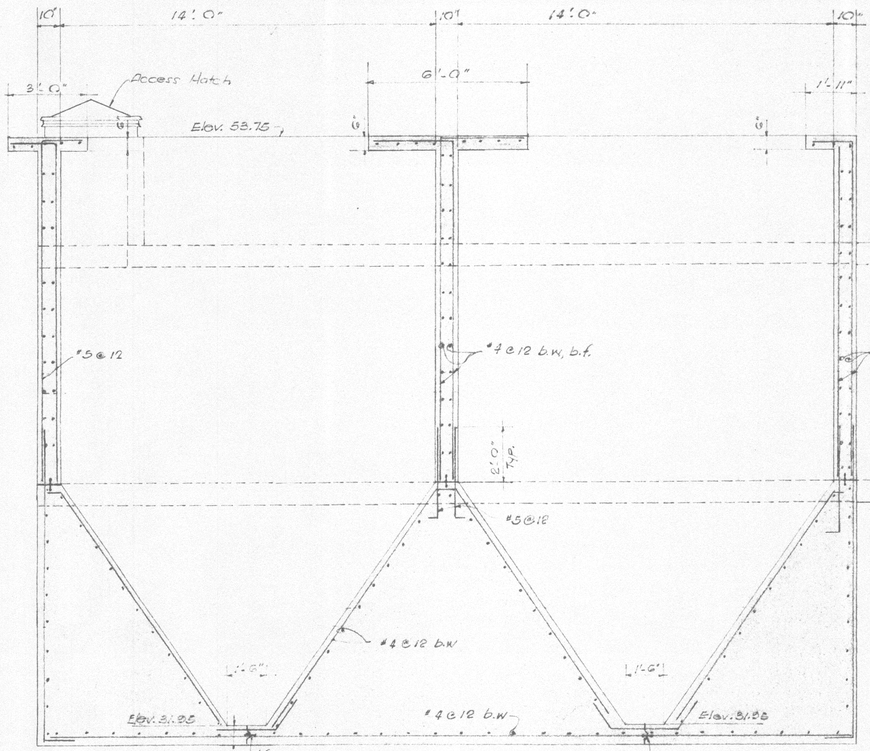
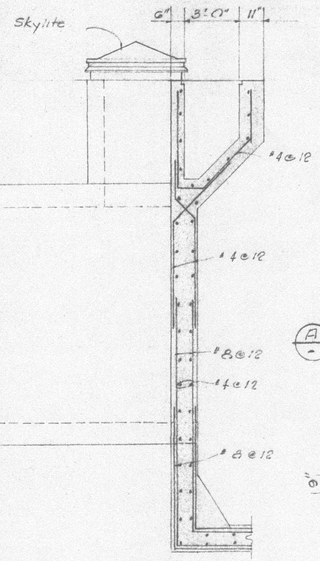
PLANNING • ENVIRONMENTAL SYSTEMS • RESEARCH
West Covina, California (213) 339-1291

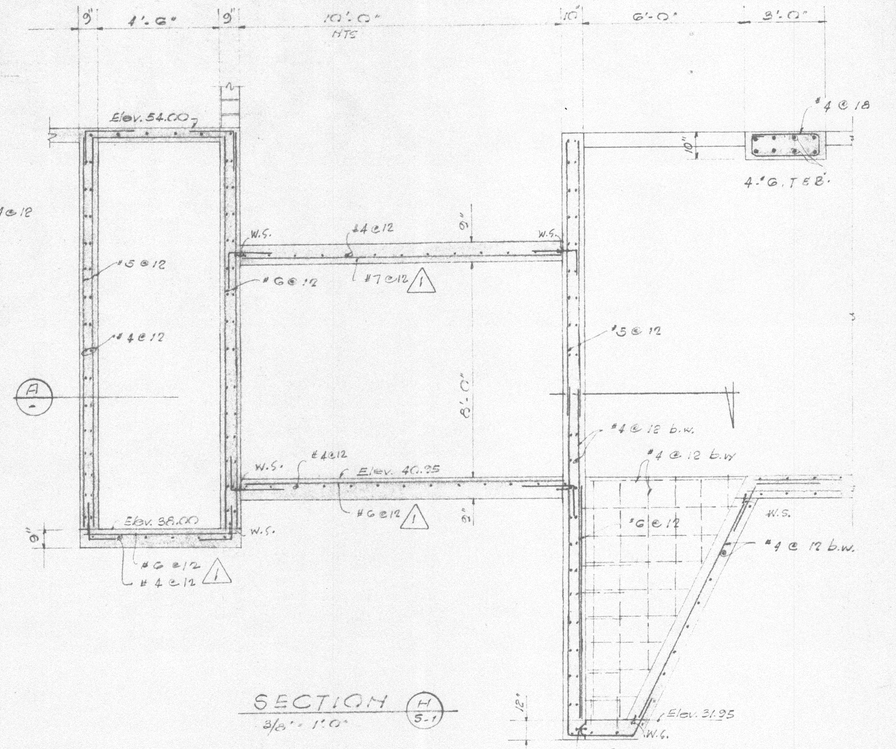
MAMMOTH COUNTY WATER DISTRICT
AERATION TANK - STRUCTURAL SECTIONS

SHEET 5-3
OF 7

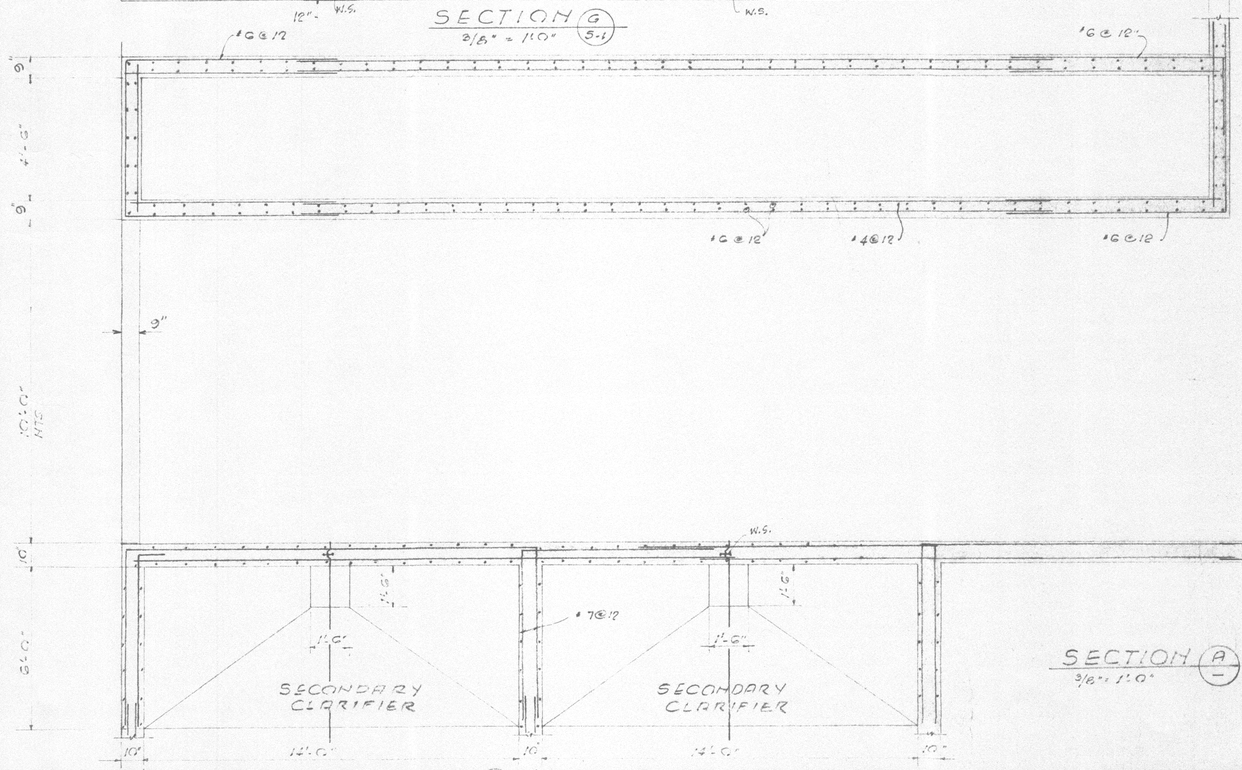


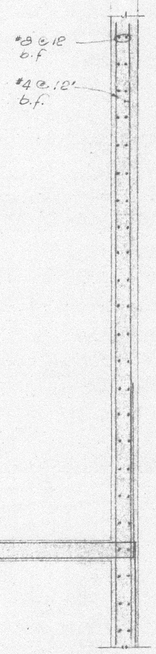
SECTION (G) 5-1
3/8" = 1'-0"



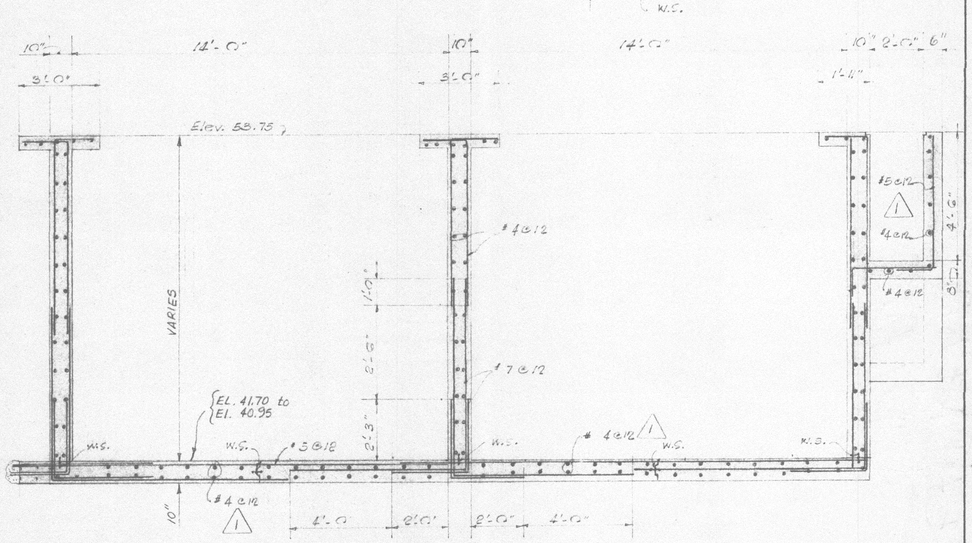


SECTION (H) 5-1
3/8" = 1'-0"





SECTION (A) —
3/8" = 1'-0"



SECTION (I) 5-1
3/8" = 1'-0"

REVISIONS			
No.	Date	Description	By
1	11/10/71	Revised per addendum No. 2	BC

JOB NO. 200
Drawn B.C. Date 4/30/71
Chk'd ALE Date

RCE 13512 Date 7/30/71
Approved

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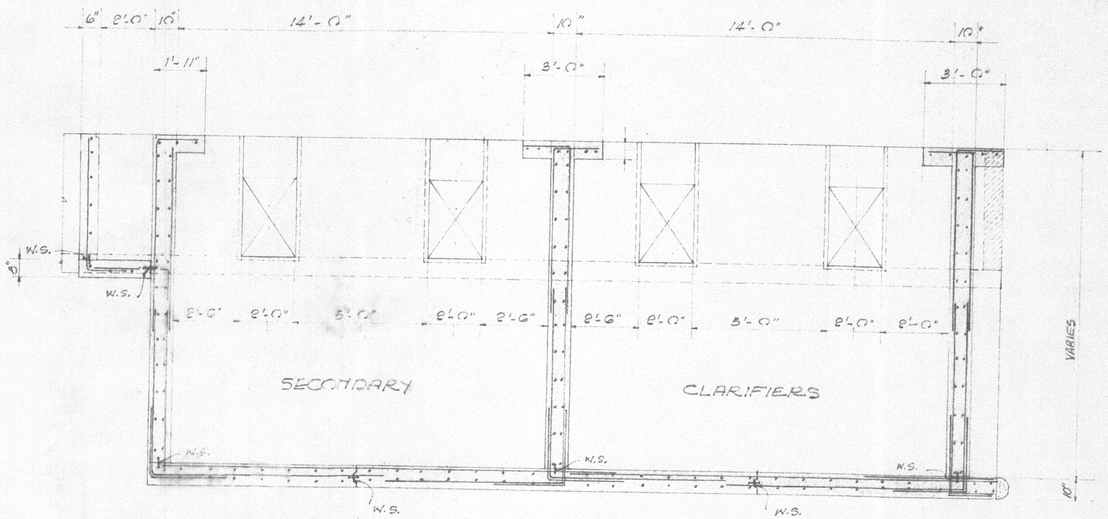
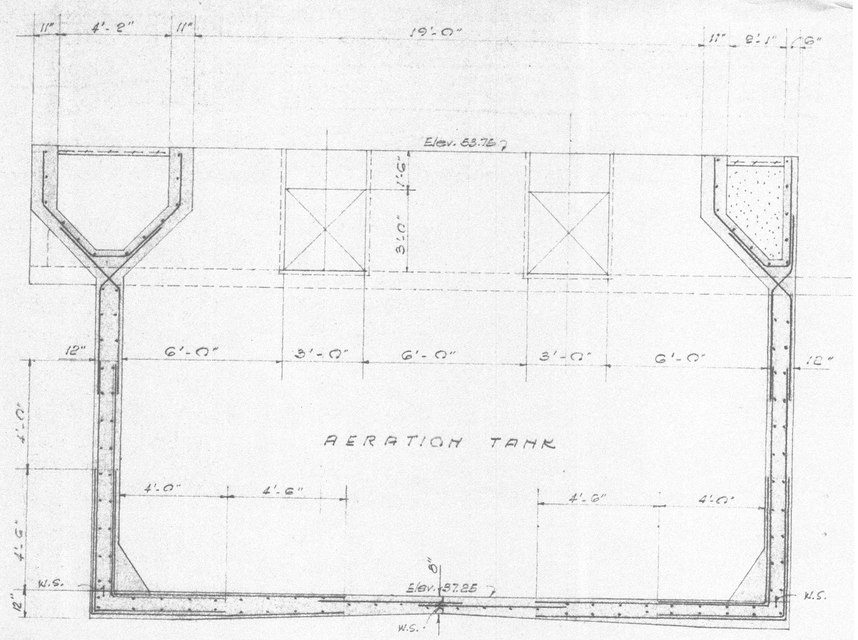
MAMMOTH COUNTY WATER DISTRICT
SECONDARY CLARIFIERS - STRUCTURAL SECTIONS

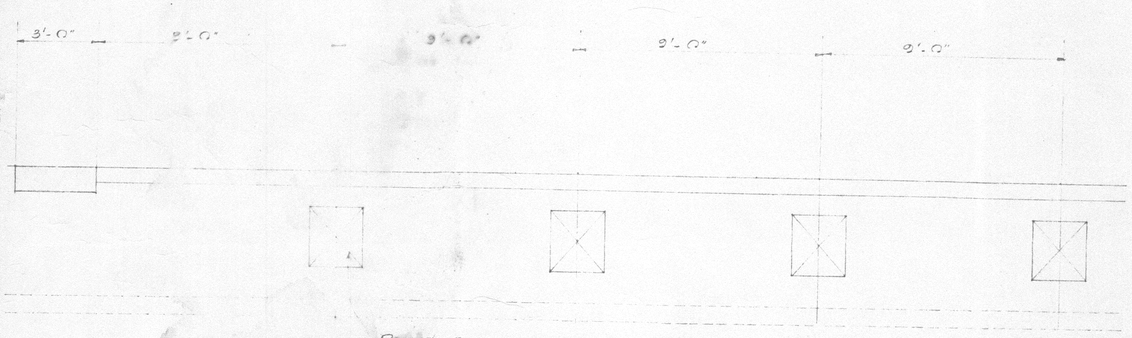
SHEET S-4 OF 7



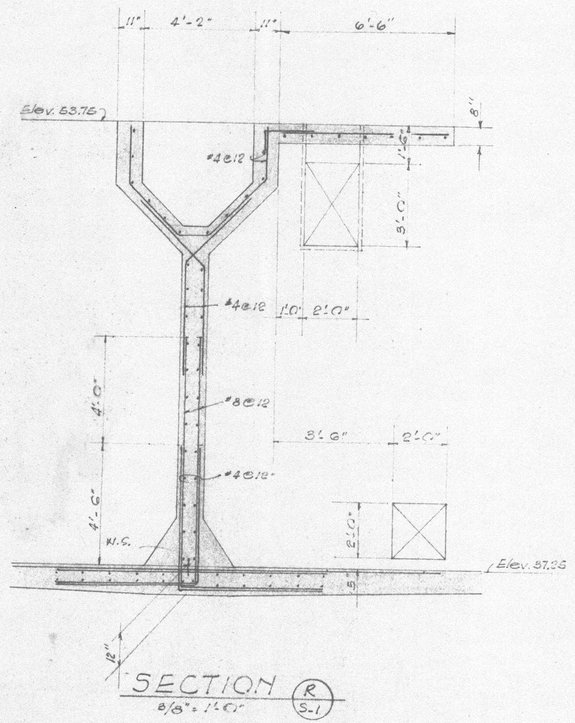
SECTION (N) S-1
3/8" = 1'-0"



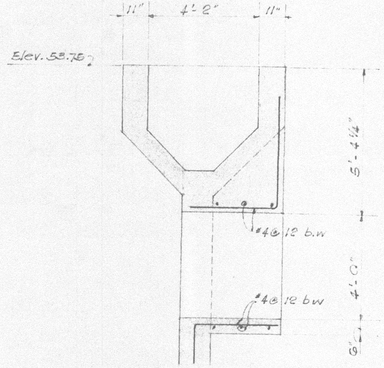
SECTION (Q) S-1
3/8" = 1'-0"



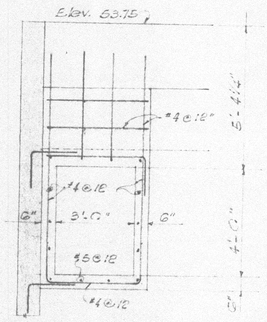
SECTION (P) S-1
3/8" = 1'-0"



SECTION (R) S-1
3/8" = 1'-0"



SECTION (S) S-1
3/8" = 1'-0"



SECTION (T) S-1
3/8" = 1'-0"

REVISIONS				JOB NO. 67.10		RCE 13015	
No.	Date	Description	By	Drawn BWC Date		Approved	Date
				Chk'd ACS Date			

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[illegible] California [illegible] (213) 337-1241

MAMMOTH COUNTY WATER DISTRICT
AERATION TANK & SECONDARY CLARIFIERS - STRUCTURAL SECTIO

NOTES:

1. PORTIONS OF EXIST. HANDRAILING MUST BE REMOVED AS INDICATED. ADD NEW POSTS AT EACH BREAK.
2. ◇ INDICATES SLIDE GATE, SEE DWG S6.
3. ALUM C8 x 5.789 GRATING END SUPPORTS SIM TO DET D/S5.
4. CONNECT WITH ALUM CLIP L4 x 4 x 1/4 AND 2 - 5/8" SST BOLTS IN EA. LEG TYP.

PRIMARY SLUDGE GALLERY

PRIMARY CLARIFIER 1

PRIMARY CLARIFIER 2

PRIMARY CLARIFIER 3

PRIMARY CLARIFIER 4

EDGE OF 14"ø HOLE

1/2"

1" CLEARANCE BET. STRUCTURES

BACKER ROD

SEALANT

ALL AROUND 14"ø HOLE

12'-0

CUT 1'-2 ø HOLES IN EXIST WALLS @ ℄ EL 7651.80. SEE NOTE M9/S1.

6 S302

7 S302

SLIDE GATES IN NEW SLOT IN TOP OF CONC WALL. TYP OF 10 SEE NOTE M9/S1 & DET A/S302 REVERSED

EXISTING MECHANICAL BUILDING

MOVE EXISTING HANDRAILING OR PROVIDE NEW SIDE-MTD H.R. TO MATCH EXIST.

5 S302

14"ø SKIMMER SEE MECH DWGS

CUT 1'-2 ø HOLE IN EXIST WALL @ ℄ EL 7651.80. SEE NOTE M9/S1.

SEE NOTE 1, TYP.

NEW HANDRAILING TO MATCH EXIST

MOVE EXIST HANDRAILING OR PROVIDE NEW SIDE-MTD TO MATCH EXIST

10'-0 SPACING MAX TO CLR SLIDE GATES

EXISTING SLOTS

NEW HANDRAILING TO MATCH EXIST.

12"ø SKIMMER SEE MECH DWGS

CUT 12 3/4" ø HOLE IN EXIST WALL ℄ EL 7651.88. SEE NOTE M9/S1.

3 S302

2 S302

1 S302

TYPE "D" GRAT'G TYP SEE DET B/S5

EXP. JOINT SEE DET F/S3

4 S302

SEE NOTE 1, TYP

10"ø SKIMMER SEE MECH DWGS

LAUNDER AND SUPPORT, TYP SEE DWG M303

GRATING END SUPPORT TYP SIM. TO DET D/S5

NEW HANDRAILING TO MATCH EXIST.

FOR CONTINUATION SEE DWG S201

SEE NOTE 3

SEE NOTE 4

CUT 10 3/4" ø HOLE IN EXIST WALL ℄ EL 7651.96. SEE NOTE M9/S1

NEW HANDRAILING TO MATCH EXIST.

TYP WALL OPNG SEE DET A & B/S302

DIFFUSER AT 4'-0 O.C. TYP, SEE MECH DWGS

3'-0 TO ℄ DIFFUSER, TYP

CUT 3" ø HOLE INV EL 7650.03 SEE NOTE M9/S1

CUT SLOT IN EXIST. WALKWAY TO SUIT EQUIP. SEE MECH DWGS, TYP OF 3 AND SEE SECT 5/S302

REMOVE EXISTING AND CONSTRUCT NEW WALKWAYS SEE NOTES M3 & M4/S1 TYP 10 PLACES

DRILL & GROUT #4@16 5" INTO EXIST STRUCTURE

8"ø SKIMMER. SEE MECH DWGS

SEE NOTE 1, TYP

SEE NOTE 1, TYP

EXISTING SKYLIGHT TO REMAIN

PRIMARY INFLUENT CHANNEL

PRIMARY EFFLUENT CHANNEL

℄ 12"SQ OPNGS W/TYPE'A" GRAT'G, SEE DET B/S5

PLAN

SCALE: 3/16" = 1'-0

BROWN AND CALDWELL	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	REVISIONS					
PASADENA, CALIFORNIA	FILE 4788	ZONE	REV.	DESCRIPTION	BY	DATE	APP.
SUBMITTED: Project Manager DATE: 12-26-90	DRAWN FRP/DKS		1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM
APPROVED: Brown and Caldwell DATE: 12-27-90	DESIGNED PAS						
APPROVED: DATE:	CHECKED PAS						
	CHECKED RMF						

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL A. SCHULTE NO. 2251 Exp. 3-31-93 STATE OF CALIFORNIA

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES WASTEWATER TREATMENT PLANT EXPANSION - PHASE II

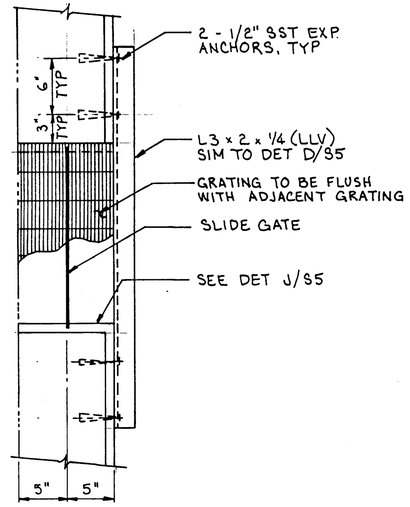
PRIMARY CLARIFIERS

PLAN

DRAWING NUMBER ⚠S301

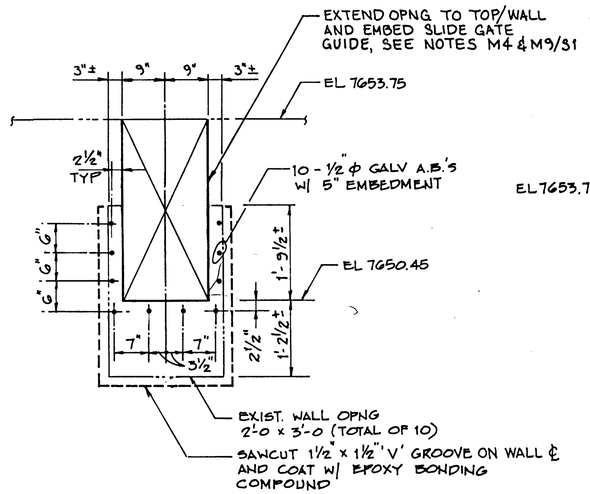
SHEET NUMBER 55

DIETERICH-POST

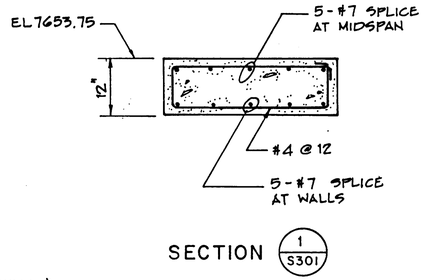


DETAIL (A / S301)

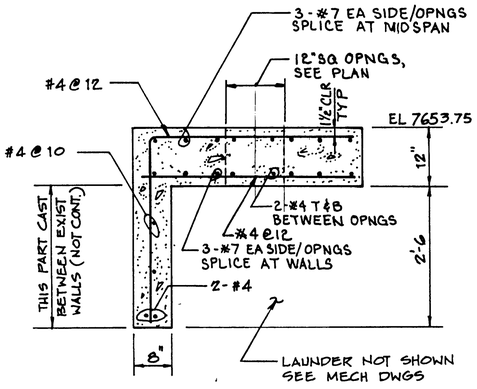
SCALE: 1-1/2"=1'-0



DETAIL (B / S301)



SECTION (1 / S301)



SECTION (2 / S301)

NOTE:

EXISTING CONC SURFACES INSIDE THE INFLUENT CHANNEL SHALL BE CLEANED AND THE WALL MADE SMOOTH WITH DRYPACK GROUT (SEE SPECS) TO SUIT THE COATING MFR AND ALL FINISHED INSIDE SURFACES SHALL RECEIVE WATERPROOFING COATING.

SECTION (3 / S301)

SCALE: 1/2" = 1'-0

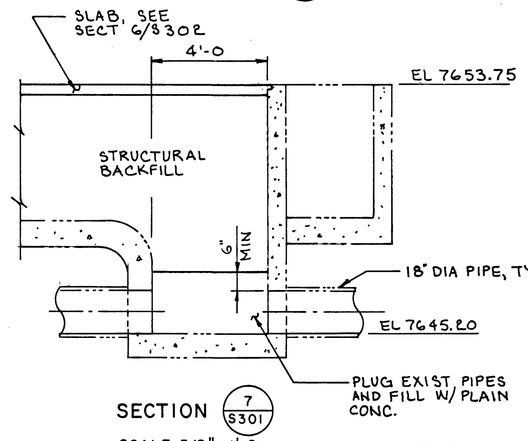
SECTION (4 / S301)

SCALE: 1/2" = 1'-0

SECTION (5 / S301)

SECTION (6 / S301)

SCALE: 1/2" = 1'-0



SECTION (7 / S301)

SCALE: 3/8" = 1'-0

SCALE: 3/4" = 1'-0 EXCEPT AS NOTED

11162

BROWN AND CALDWELL
PASADENA, CALIFORNIA

SUBMITTED: Project Manager DATE: 12-26-90
APPROVED: Brown and Caldwell DATE: 12-27-90
APPROVED: DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN FRP/DKS
DESIGNED PAS
CHECKED PAS
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL A. SCHULTE — NO. 2251 Exp. 3-31-93 — STRUCTURAL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

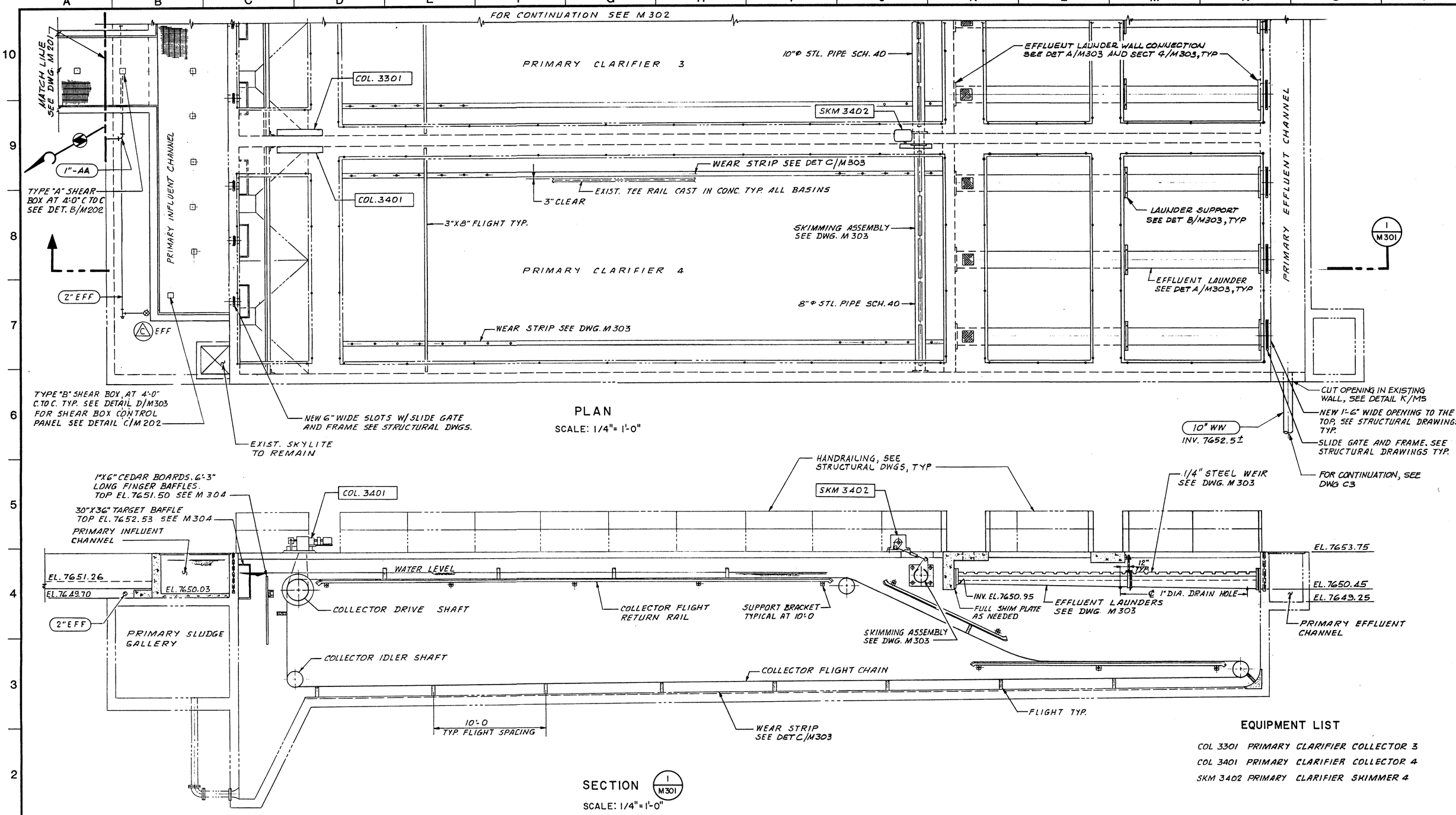
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION - PHASE II

PRIMARY CLARIFIERS

SECTIONS AND DETAILS

DRAWING NUMBER ⚠S302
SHEET NUMBER 56

DIETERICH-POST 330238



PLAN

SCALE: 1/4"= 1'-0"

SECTION I/M301

SCALE: 1/4"= 1'-0"

EQUIPMENT LIST

COL 3301 PRIMARY CLARIFIER COLLECTOR 3

COL 3401 PRIMARY CLARIFIER COLLECTOR 4

SKM 3402 PRIMARY CLARIFIER SKIMMER 4

11176

BROWN AND CALDWELL

SUBMITTED: Project Manager DATE: 12-26-91

APPROVED: Brown and Caldwell DATE: 12-27-90

APPROVED: DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788

DRAWN P.H

DESIGNED CJK

CHECKED CJK

CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK No. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY KUO No. 41588 Exp. 12-31-91 CIVIL STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM No. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES WASTEWATER TREATMENT PLANT EXPANSION—PHASE II

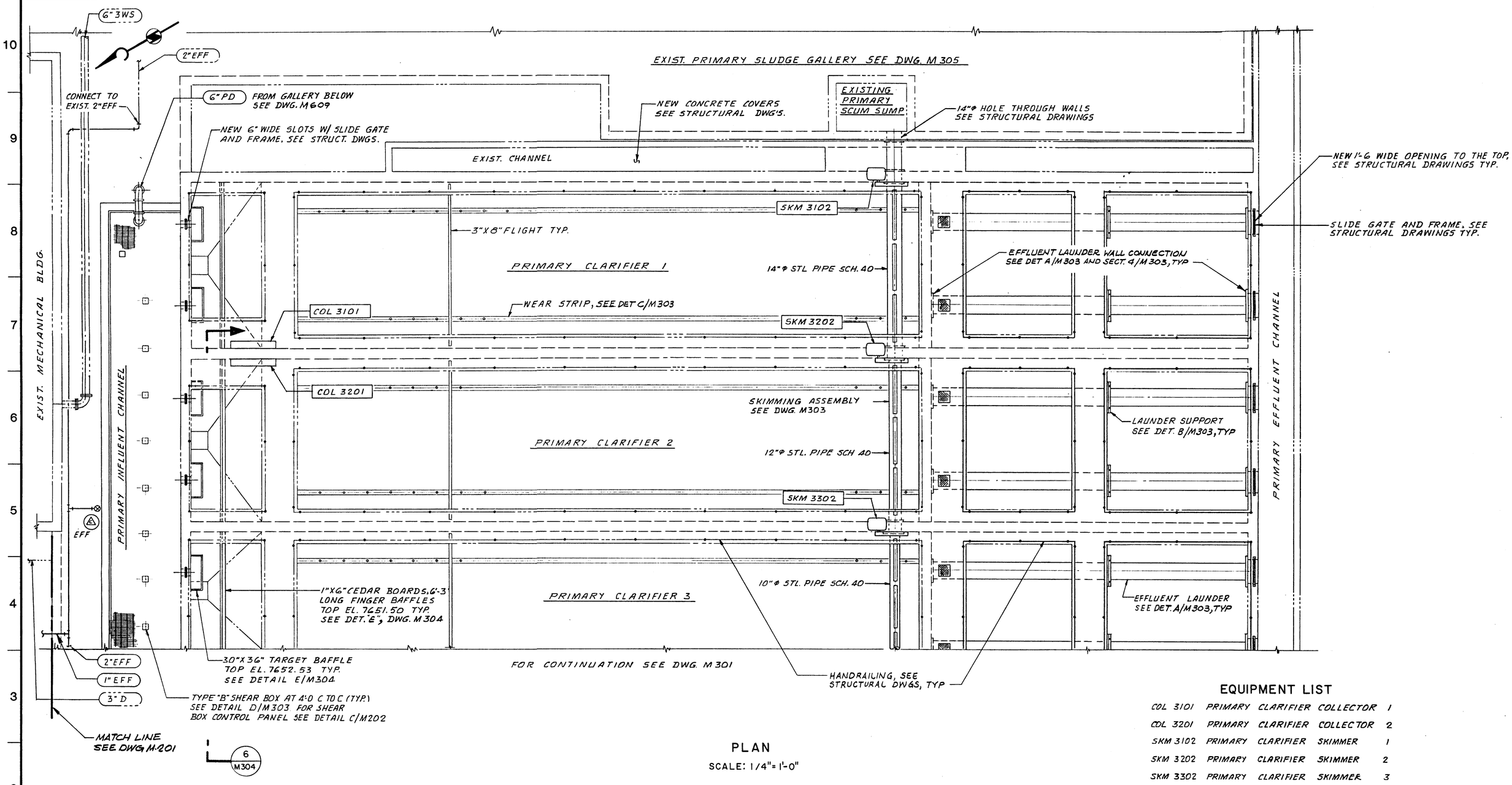
PRIMARY CLARIFIERS

PLAN, SECTION AND EQUIPMENT LIST

DRAWING NUMBER ⚠M 301A

SHEET NUMBER 89

DIETERICH-POST



PLAN

SCALE: 1/4" = 1'-0"

EQUIPMENT LIST

COL 3101	PRIMARY	CLARIFIER	COLLECTOR	1
COL 3201	PRIMARY	CLARIFIER	COLLECTOR	2
SKM 3102	PRIMARY	CLARIFIER	SKIMMER	1
SKM 3202	PRIMARY	CLARIFIER	SKIMMER	2
SKM 3302	PRIMARY	CLARIFIER	SKIMMER	3

11177

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90

APPROVED: _____ Brown and Caldwell DATE: 12-27-90

APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER AZHAR M. MALIK NO. C040370 Exp. 3-31-91 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CHING-JEY KUO No. 19389 Exp. 12-31-91 CIVIL STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

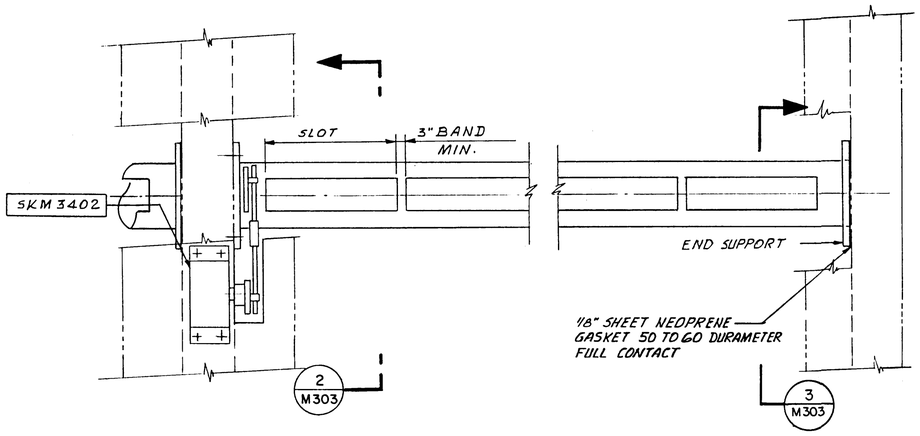
PRIMARY CLARIFIERS

PLAN AND EQUIPMENT LIST

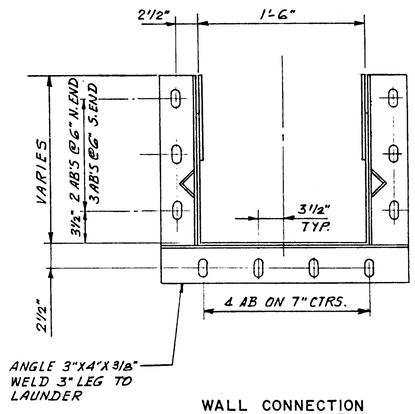
DRAWING NUMBER 1M 302

SHEET NUMBER 90

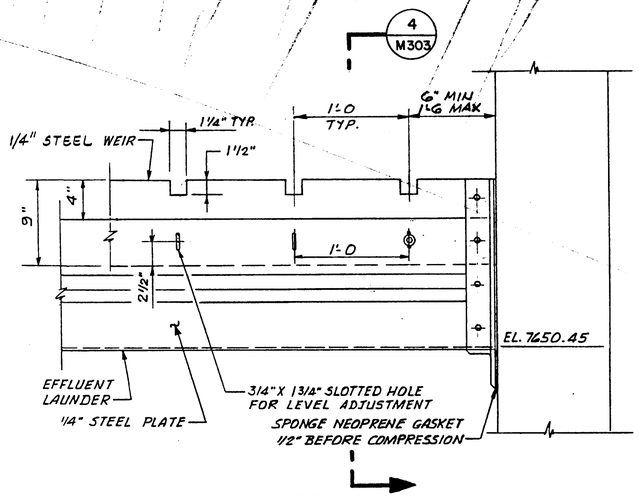
112848 DIETERICH-POST



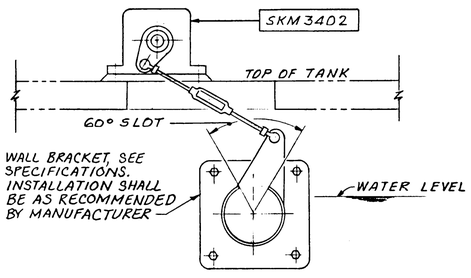
SKIMMING ASSEMBLY
PLAN
SCALE: 3/4"= 1'-0"



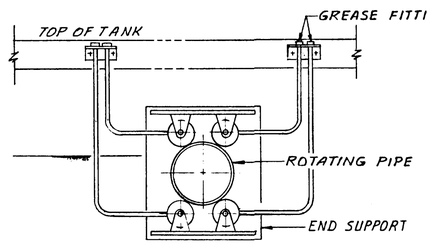
WALL CONNECTION
SECTION 4 M303
SCALE: 1 1/2"= 1'-0"



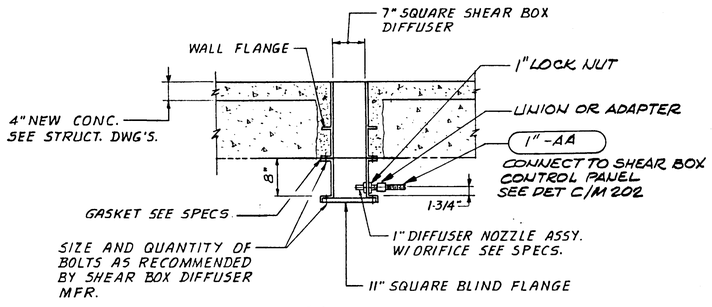
EFFLUENT LAUNDER
DETAIL A M301 A M302
SCALE: 1 1/2"= 1'-0"



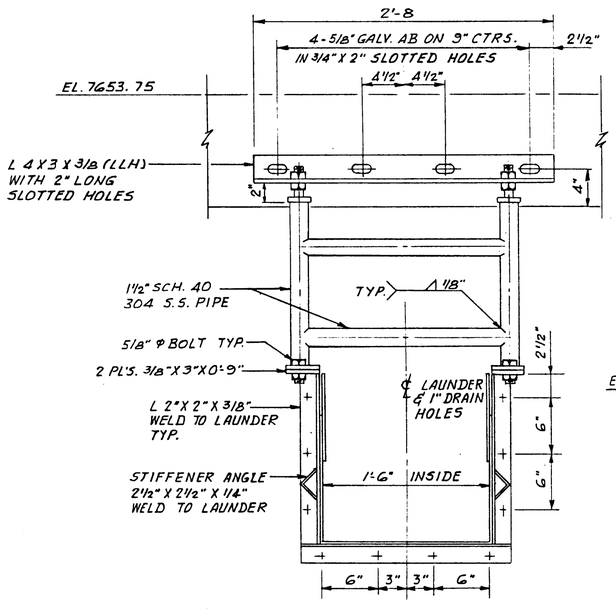
SECTION 2 M303
SCALE: 3/4"= 1'-0"



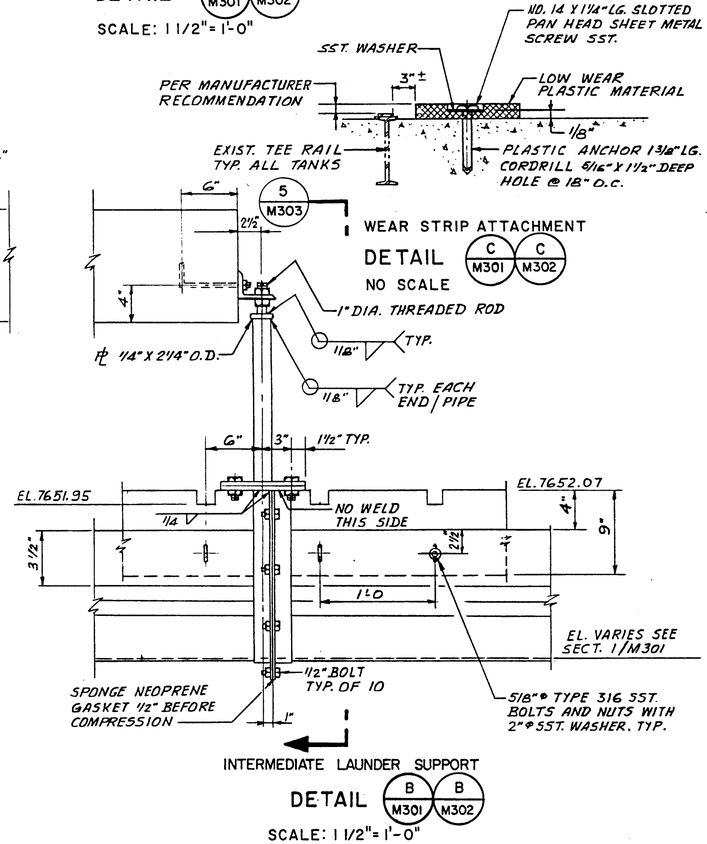
SECTION 3 M303
SCALE: 3/4"= 1'-0



TYPE "B" SHEAR BOX
(CAST-IN TYPE WITH BOTTOM ACCESS)
DETAIL D M301
NOT TO SCALE



SECTION 5 M303
SCALE: 1 1/2"= 1'-0"



111178

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90
APPROVED: _____ Brown and Caldwell DATE: 12-27-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN P.H
DESIGNED C.J.K
CHECKED C.J.K
CHECKED R.M.F

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — JOYING-JEY KUO — No. 18889 Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM No. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

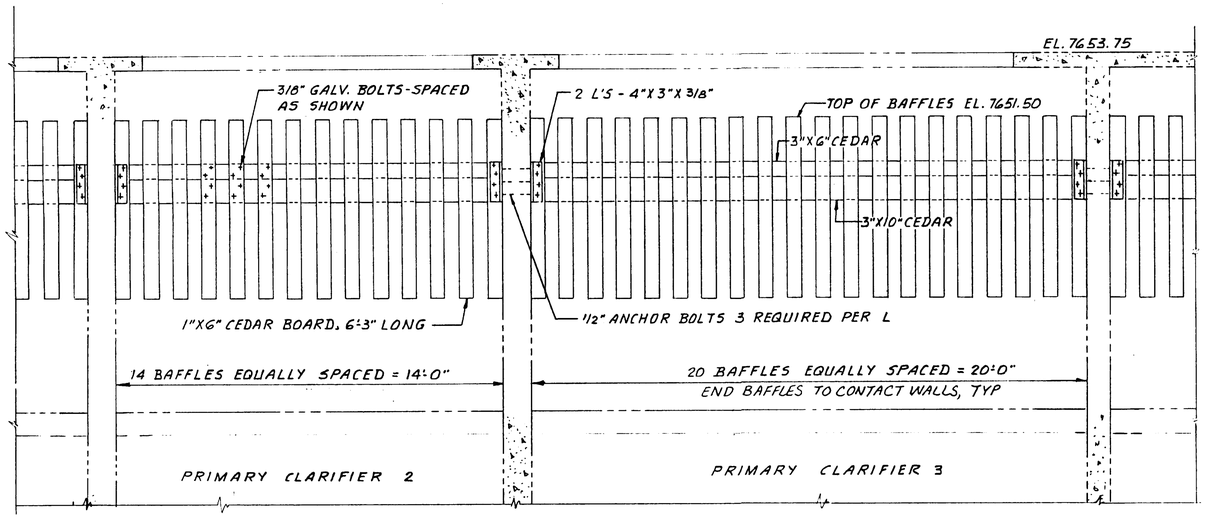
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

PRIMARY CLARIFIERS

PLAN, SECTIONS, AND DETAILS

DRAWING NUMBER 1 M303
SHEET NUMBER 91

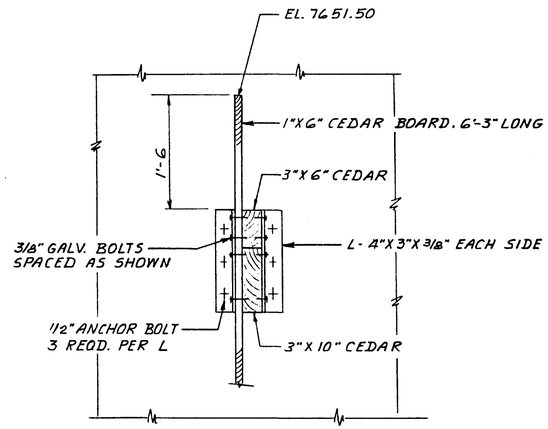
DIETERICH-POST



FINGER BAFFLE

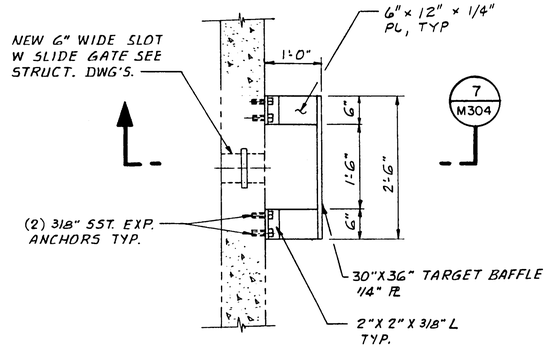
SECTION 6/M302

SCALE: 3/8"=1'-0



DETAIL E/M304 E/M302

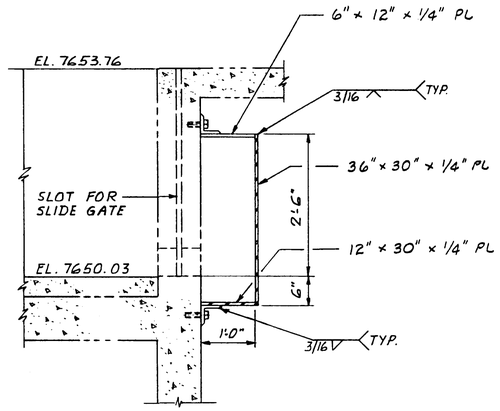
SCALE: 1"=1'-0



TARGET BAFFLE PLAN

DETAIL F/M302

SCALE: 3/4"=1'-0



SECTION 7/M304

SCALE: 3/4"=1'-0

11179

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 12-26-90

APPROVED: _____ Brown and Caldwell DATE: 12-27-90

APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED CJK
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — ALMAR M. MALIK — NO. C040370 Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — CHING-JEY KUO — No. 41389 Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PCM NO. 11 - NEW DRAWING	CJK	8/91	AMM

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE II

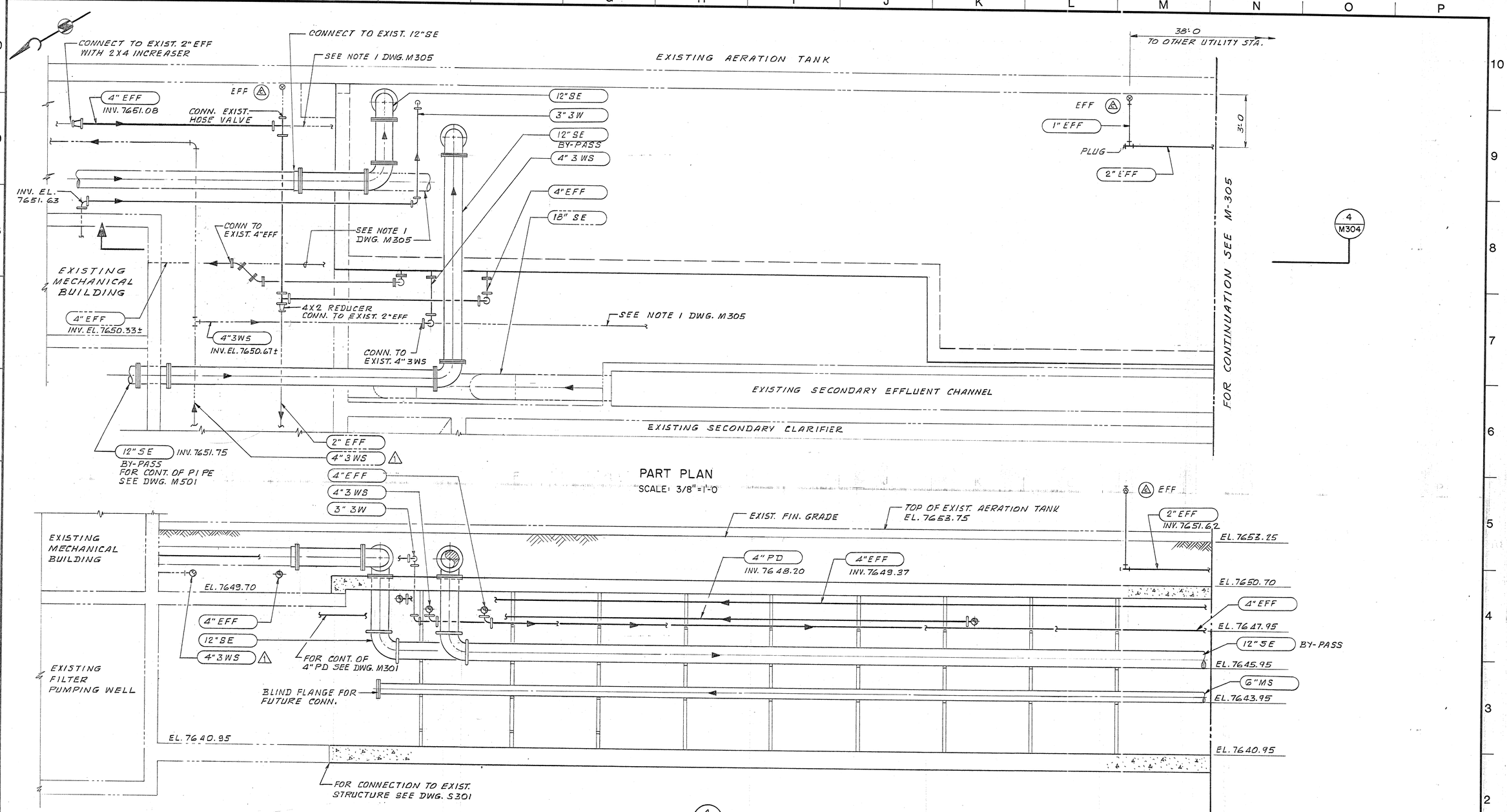
PRIMARY CLARIFIERS

SECTIONS AND DETAILS

DRAWING NUMBER M 304 1

SHEET NUMBER 92

137780 DIETERICH-POST



PART PLAN
SCALE: 3/8"=1'-0

SECTION 4 M304
SCALE: 3/8"=1'-0

RECORD DRAWING
BY _____ DATE 7-6-93
THIS RECORD DRAWING WAS PREPARED USING INFORMATION REPORTED TO BROWN AND CALDWELL AND CONTAINS ONLY THE STANDARD AND CUSTOMARY LEVEL OF DETAIL. THE INFORMATION WAS NOT INDEPENDENTLY FIELD VERIFIED. THERE IS NO ONGOING PROGRAM TO UPDATE THE DRAWINGS TO REFLECT CHANGES SUBSEQUENT TO THE DATE INDICATED. THEREFORE, THIS DRAWING CANNOT BE RELIED UPON AS AN EXACT REPRESENTATION OF ACTUAL CONDITIONS.

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 4-30-90
APPROVED: _____ Brown and Caldwell DATE: 4-30-90
APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED AMM
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — No. C040370 — Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — CHING-JEY KUO — No. 119389 — Exp. _____ — STATE OF CALIFORNIA

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	FIELD CHANGE	AG	11/92	CJK

MAMMOTH COUNTY WATER DISTRICT

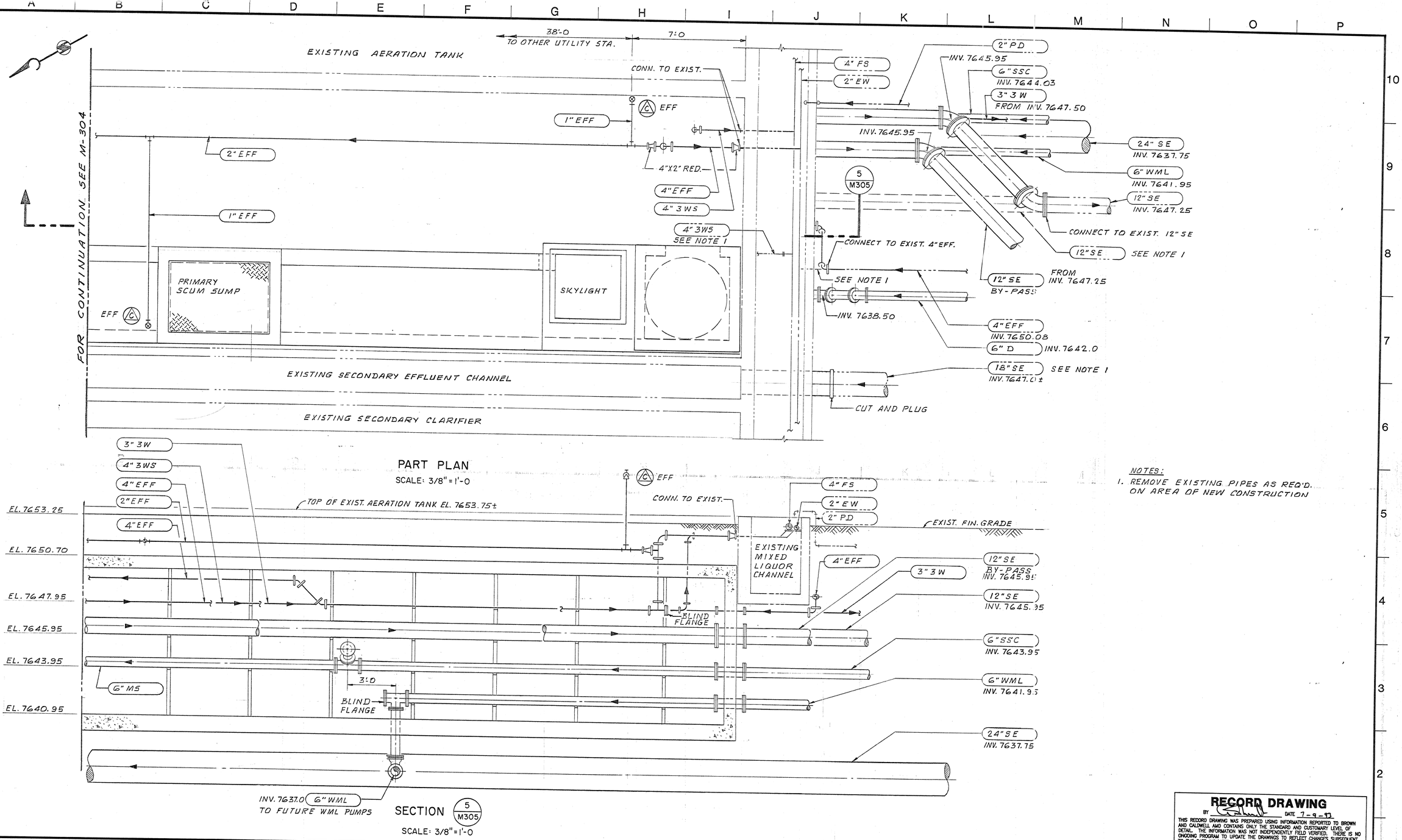
MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

SECONDARY SLUDGE GALLERY

PART PLAN 1 AT GRADE AND SECTION

DRAWING NUMBER M304
SHEET NUMBER

112545
DIETERICH-POST



PART PLAN

SCALE: 3/8" = 1'-0

SECTION

5
M305

SCALE: 3/8" = 1'-0

NOTES:

1. REMOVE EXISTING PIPES AS REQ'D. ON AREA OF NEW CONSTRUCTION

RECORD DRAWING

BY _____ DATE 7-9-97

THIS RECORD DRAWING WAS PREPARED USING INFORMATION REPORTED TO BROWN AND CALDWELL AND CONTAINS ONLY THE STANDARD AND CUSTOMARY LEVEL OF DETAIL. THE INFORMATION WAS NOT INDEPENDENTLY FIELD VERIFIED. THERE IS NO ONGOING PROGRAM TO UPDATE THE DRAWINGS TO REFLECT CHANGES SUBSEQUENT TO THE DATE INDICATED. THEREFORE, THIS DRAWING CANNOT BE RELIED UPON AS AN EXACT REPRESENTATION OF ACTUAL CONDITIONS.

BROWN AND CALDWELL

SUBMITTED: _____ Project Manager DATE: 4-7-90

APPROVED: _____ Brown and Caldwell DATE: 4-30-90

APPROVED: _____ DATE: _____

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)

FILE 4788
DRAWN PH
DESIGNED CJK
CHECKED AMM
CHECKED RMF

REGISTERED PROFESSIONAL ENGINEER — AZHAR M. MALIK — No. C040370 — Exp. 3-31-91 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — CHING-JEY KUO — No. 119389 — Exp. 12-31-91 — CIVIL — STATE OF CALIFORNIA

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

MAMMOTH COUNTY WATER DISTRICT

MAMMOTH LAKES
WASTEWATER TREATMENT PLANT
EXPANSION—PHASE I

SECONDARY SLUDGE GALLERY

PART PLAN 2 AT GRADE AND SECTION

DRAWING NUMBER M305

SHEET NUMBER

DIETERICH-POST 152845