

REQUEST FOR PROPOSAL (RFP)

for Tomato Stand Bridge Abutments

RFP# 482-25-01

ADDENDA

Prospective bidders are responsible for reviewing any published addenda regarding this bid at ebmud.com/business-center

CONTACT

Bert Mulchaey, Supervising Fisheries and Wildlife Biologist
(510) 287-2038
bert.mulchaey@ebmud.com

RESPONSE DUE

June 10, 2025
4:00 p.m. PST

SUBMIT ELECTRONICALLY TO*

Bert Mulchaey, Supervising Fisheries and Wildlife Biologist
(510) 287-2038
bert.mulchaey@ebmud.com

**Hardcopy proposals will not be accepted*

EAST BAY MUNICIPAL UTILITY DISTRICT

RFP for Tomato Stand Bridge Abutments RFP# 482-25-01

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I. STATEMENT OF WORK

A. SCOPE

It is the intent of these specifications, terms, and conditions to describe services to frame and pour bridge abutments and install associated H-piles.

East Bay Municipal Utility District (District) intends to award a one-year contract to the Proposer(s) who best meets the District's requirements.

The East Bay Municipal Utility District is completing a fish passage project on Pinole Creek. The project will improve fish access to upper Pinole Creek by replacing a corrugated metal culvert with a prefabricated channel spanning bridge. The site is on EBMUD's East Bay Watershed in Pinole Valley, and the site access is via Alhambra Valley Road. EBMUD is seeking a contractor to frame and pour reinforced concrete abutments and install associated H-piles for the prefabricated bridge. The site will be excavated to proper grade for the abutments by EBMUD and no significant excavation or backfilling will be required by the contractor.

B. PROPOSER QUALIFICATIONS

1. Proposer Minimum Qualifications

- a. Proposer, Proposer's principal, or Proposer's staff shall have been regularly engaged in the business of providing construction services for at least 3 years.
- b. Proposer shall possess all permits, licenses, and professional credentials necessary to perform services as specified under this RFP.

C. SPECIFIC REQUIREMENTS

The Tomato Stand Culvert is located on Pinole Creek within the EBMUD Pinole Creek Watershed in Contra Costa County. The site location is in unincorporated Contra Costa County approximately 3 miles east of the city of Pinole. The site is adjacent to Alhambra Valley Road which provides direct access to the site.

The site will be excavated to proper grade for the piles and abutments by EBMUD staff and no significant excavation or backfilling will be required by the contractor. EBMUD will complete all backfill after abutments are installed as well as placement and surfacing of the bridge.

The abutments and associated H-piles shall be installed according to the specifications and construction drawings attached as Exhibit F. The scope of work will include the installation of 8 H-piles (4 per abutment) and the framing and pouring of two cast-in-

place reinforced concrete abutments (approximately 20 x 3 x 7 ft). The project is somewhat remote and will require onsite pouring of concrete for the abutments. The contract will include the installation of the driven H-piles, the framing and pouring of the reinforced concrete abutments (including structural steel and bridge mounting bolts), and removal of all framing and materials once the concrete has cured. The costs for all materials required for the H-piles and abutments including piles, framing, concrete, steel reinforcement and other required materials shall be included in bidder's proposal. EBMUD will procure the bridge and the required mounting bolts for the bridge for installation in the abutments. Proposals should include the cost of installing the provided bolts in the poured abutments.

Project environmental permits have not yet been acquired but will require that the project be constructed in the dry season and that all construction be completed by October 15th, 2025. Based on these restrictions, framing and pouring of the footings must be completed by October 1st, 2025, so that EBMUD can complete site backfilling and channel work in advance of the October 15th deadline. Proposers should base their proposals on an expectation that abutments will be framed and poured over a 4-week period in September, after H-piles are driven. It is expected that the eastern abutment will be framed first followed by a pause for several days for EBMUD to complete excavation for the western abutment before framing of that abutment can proceed. EBMUD will consider alternatives to this staging of work provided that the framing and pouring of the abutments is completed in the required 4-week timeframe and proposed alternatives do not significantly increase costs.

Abutment construction must follow all requirements and protection measures spelled out in the project permits from the Army Corps of Engineers, the Water Board and the California Department of Fish and Wildlife that are expected to be received by August 2025.

D. DELIVERABLES

1. Two reinforced concrete abutments and 8 installed H-piles as designed.

II. CALENDAR OF EVENTS

EVENT	DATE/LOCATION	
RFP Issued	May 9, 2025	
MANDATORY Site Walk	May 29, 2025 10am	at: Tomato Stand Project Site
Response Due	June 10, 2025 by 4:00 p.m.	
Anticipated Contract Start Date	July 10, 2025	

Note: All dates are subject to change by District.

Proposers are responsible for reviewing <https://www.ebmud.com/business-center/requests-proposal-rfps/> for any published addenda. Hard copies of addenda will not be mailed out.

A. MANDATORY SITE WALK

Mandatory site walk will be held to:

1. Allow the District to discuss the scope of the project.
2. Provide Proposers an opportunity to view a site, receive documents, etc. necessary to respond to this RFP.
3. Provide an opportunity for Proposers to ask specific questions about the project and request RFP clarifications.
4. Provide the District with an opportunity to receive feedback regarding the project and RFP.

Contact the project manager Bert Mulchaey (bert.mulchaey@ebmud.com) via email by May 27, 2025 to RSVP for the mandatory site walk, to allow for adequate planning. All questions deemed to be pertinent by the District will be addressed in Addenda following the site walk.

*****In order to be eligible to submit a Proposal on this RFP**, a representative from the Proposer's company **MUST** attend site walk/Proposal conference and sign into confirm her/his attendance. If an RFP response is submitted by a company that was not in attendance at this meeting, its RFP response **WILL** be rejected*******

III. DISTRICT PROCEDURES, TERMS, AND CONDITIONS

A. RFP ACCEPTANCE AND AWARD

1. RFP responses will be evaluated by the Selection Committee and will be scored and ranked in accordance with the RFP section entitled "Evaluation Criteria/Selection Committee."
2. The Selection Committee will recommend award to the Proposer who, in its opinion, has submitted the RFP response that best serves the overall interests of the District. Award may not necessarily be made to the Proposer with the lowest overall cost.
3. The District reserves the right to award to a single or to multiple General or Professional Service Providers, dependent upon what is in the best interest of the District.
4. The District has the right to decline to award this contract or any part of it for any reason.
5. Any specifications, terms, or conditions issued by the District, or those included in the Proposer's submission, in relation to this RFP, may be incorporated into any purchase order or contract that may be awarded as a result of this RFP.
6. Award of contract. The District reserves the right to reject any or all proposals, to accept one part of a proposal and reject the other, unless the proposer stipulates to the contrary, and to waive minor technical defects and administrative errors, as the interest of the District may require. Award will be made, or proposals rejected by the District as soon as possible after proposals have been opened.

B. EVALUATION CRITERIA/SELECTION COMMITTEE

All proposals will be evaluated by a Selection Committee. The Selection Committee may be composed of District staff and other parties that have expertise or experience in this type of procurement. The Selection Committee will select a Proposer in accordance with the evaluation criteria set forth in this RFP. The evaluation of the RFP responses shall be within the sole judgment and discretion of the Selection Committee.

The Selection Committee will evaluate each RFP response meeting the qualification requirements set forth in this RFP. Proposer should bear in mind that any RFP response that is unrealistic in terms of the technical or schedule commitments, or unrealistically high or low in cost, will be deemed reflective of an inherent lack of technical competence or indicative of a failure to comprehend the complexity and risk of the District's requirements as set forth in this RFP.

RFP responses will be evaluated and scored according to the Evaluation Criteria below and scored according to a zero to five-point scale. The scores for all Evaluation Criteria will then be added to arrive at a weighted score for each RFP response. An RFP response with a high weighted total will be ranked higher than one with a lesser-weighted total.

The Evaluation Criteria are as follows:

	Evaluation Criteria
A.	Cost: The points for Cost will be computed by dividing the amount of the lowest responsive RFP response received by each Proposer's total proposed cost. While not reflected in the Cost evaluation points, an evaluation may also be made of: 1. Reasonableness (i.e., does the proposed pricing accurately reflect the Proposer's effort to meet requirements and objectives?); 2. Realism (i.e., is the proposed cost appropriate to the nature of the products and services to be provided?); and 3. Affordability (i.e., the ability of the District to finance this project). Consideration of price in terms of overall affordability may be controlling in circumstances where two or more RFP responses are otherwise judged to be equal, or when a superior RFP response is at a price that the District cannot afford.
B.	Implementation Plan and Schedule: An evaluation will be made of the likelihood that the Proposer's implementation plan and schedule will meet the District's schedule. Additional credit will be given for the identification and planning for mitigation of schedule risks which the Proposer believes may adversely affect any portion of the District's schedule.
C.	Relevant Experience: RFP responses will be evaluated against the RFP specifications and the questions below: 1. Do the individuals assigned to the project have experience on similar projects? 2. Are résumés complete and do they demonstrate backgrounds that would be desirable for individuals engaged in the work the project requires? 3. How extensive is the applicable education and experience of the personnel designated to work on the project?

D.	References (See Exhibit A – RFP Response Packet): If a short list process is used for a solicitation, references are only performed on the shortlisted Proposers and the score for reference checks is not included in the preliminary short list score.
E.	Understanding of the Project: RFP responses will be evaluated against the RFP specifications and the questions below: 1. Has the Proposer demonstrated a thorough understanding of the purpose and scope of the project? 2. How well has the Proposer identified pertinent issues and potential problems related to the project? 3. Has the Proposer demonstrated that it understands the deliverables the District expects it to provide? 4. Has the Proposer demonstrated that it understands the District's time schedule and can meet it?
F.	Methodology: RFP responses will be evaluated against the RFP specifications and the questions below: 1. Does the methodology depict a logical approach to fulfilling the requirements of the RFP? 2. Does the methodology match and contribute to achieving the objectives set out in the RFP? 3. Does the methodology interface with the District's time schedule?
G.	Contract Equity Program: Proposer shall be eligible for SBE or DVBE preference points if they are a certified small business entity, as described in the guidelines contained in Exhibit A-Contract Equity Program, <u>and</u> they check the appropriate box, requesting preference, in Exhibit A-Proposer Information and Acceptance. Qualified DVBEs and/or SBEs will receive an additional 5 points to their total score.

C. PRICING

1. Prices quoted shall be firm for the first 12 months of any contract that may be awarded pursuant to this RFP.
2. All prices quoted shall be in United States dollars.
3. Price quotes shall include any and all payment incentives available to the District.
4. Proposers are advised that in the evaluation of cost, if applicable, it will be assumed that the unit price quoted is correct in the case of a discrepancy between the unit price and extended price.

5. Prevailing Wages:

All Contractors proposing on a public works project and all Subcontractors of any tier shall be registered with the State Department of Industrial Relations pursuant to Section 1725.5 of the Labor Code.

The Contractor shall post a copy of the general prevailing rate of per diem wages at the jobsite pursuant to Section 1773.2 of the Labor Code of the State of California.

Pursuant to the provisions of Division 2, Part 7, Chapter 1, Article 2, and any amendments thereof of the Labor Code of the State of California, the Contractor and any Subcontractor shall pay not less than the specified prevailing rate of wages to all workers employed in the execution of the contract.

The Contractor shall, as a penalty to the State or the District, forfeit Twenty-Five (\$25.00) Dollars for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing rates for any work or craft in which such worker is employed under the contract by the Contractor or by any Subcontractor. The difference between such stipulated prevailing wage rates and the amount paid to such worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor. The Contractor shall comply with the provisions of Section 1776 of the Labor Code of the State of California. For all classes of work not specified herein, the minimum wage shall be that specified for general laborer.

The specified wage rates are minimum rates only and the District will not consider and shall not be liable for any claims for additional compensation made by the Contractor because of payment by Contractor of any wage rate in excess of the general prevailing rates. All disputes in regard to the payment of wages in excess of those specified herein shall be adjusted by the Contractor at his own expense.

The holidays upon which such rates shall be paid shall be all holidays recognized in the collective bargaining agreement applicable to the particular craft, classification, or type of worker employed on the project.

D. NOTICE OF INTENT TO AWARD AND PROTESTS

At the conclusion of the RFP response evaluation process, all entities who submitted a proposal package will be notified in writing by e-mail or USPS mail with the name of the

Proposer being recommended for contract award. The document providing this notification is the Notice of Intent to Award.

Negotiations for a Consulting Services Agreement with a “not to exceed” contract price (for time and expenses) will be scheduled shortly after the Notice of Intent to Award. If an Agreement cannot be achieved, the District will proceed to negotiate with the next highest ranked Proposer.

Protests must be in writing and must be received no later than seven (7) workdays after the District issues the Notice of Intent to Award. The District will reject the protest as untimely if it is received after this specified time frame. Protests will be accepted from proposers or potential proposers only.

If the protest is mailed and not received by the District, the protesting party bears the burden of proof to submit evidence (e.g., certified mail receipt) that the protest was sent in a timely manner so that it would be received by the District within the RFP protest period.

Proposal protests must contain a detailed and complete written statement describing the reason(s) for protest. The protest must include the name and/or number of the proposal, the name of the firm protesting, and include a name, telephone number, email address and physical address of the protester. If a firm is representing the protester, they shall include their contact information in addition to that of the protesting firm.

Protests must be mailed, hand delivered, or emailed to the Manager of Purchasing, Mailstop 102, East Bay Municipal Utility District, 1010 Franklin St., Oakland, CA 94607 or P.O. Box 24055, Oakland, California 94623. Facsimile and electronic mail protests must be followed by a mailed or hand delivered identical copy of the protest and must arrive within the seven workday time limit. Any proposal protest filed with any other District office shall be forwarded immediately to the Manager of Purchasing.

In the event that the protest is denied, the protester can appeal the determination to the requesting organization’s Department Director. The appeal must be submitted to the Department Director no later than five workdays from the date which the protest determination was transmitted by the District, to the protesting party. The appeal shall focus on the points raised in the original protest, and no new points shall be raised in the appeal.

Such an appeal must be made in writing and must include all grounds for the appeal and copies of the original protest and the District’s response. The proposal protester must also send the Purchasing Division a copy of all materials sent to the Department Director.

The Department Director will make a determination of the appeal and respond to the protester by certified mail in a timely manner. If the appeal is denied, the letter will include the date, time, and location of the Board of Directors meeting at which staff will make a recommendation for award and inform the protester it may request to address the Board of Directors at that meeting.

The District may transmit copies of the protest and any attached documentation to all other parties who may be affected by the outcome of the protest. The decision of the District as to the validity of any protest is final. This District's final decision will be transmitted to all affected parties in a timely manner.

E. WARRANTY

1. Proposer expressly warrants that all goods and services to be furnished pursuant to any contract awarded it arising from the Proposal will conform to the descriptions and specifications contained herein and in supplier catalogs, product brochures, and other representations, depictions, or models, and will be free from defects, of merchantable quality, good material, and workmanship. Proposer expressly warrants that all goods and services to be furnished pursuant to such award will be fit and sufficient for the purpose(s) intended. This warranty shall survive any inspections, delivery, acceptance, payment, or contract termination for any reason, by the District. Proposer warrants that all work and services furnished hereunder shall be guaranteed for a period of one year from the date of acceptance by the District.

F. INVOICING

1. Following the District's acceptance of product(s) meeting all specified requirements, and/or the complete and satisfactory performance of services, the District will render payment within thirty (30) days of receipt of a correct invoice.
2. The District will notify the General or Professional Service Provider of any invoice adjustments required.
3. Invoices shall contain, at a minimum, District purchase order number, invoice number, remit to address, and itemized services description.
4. The District will pay General or Professional Service Provider in an amount not to exceed the negotiated amount(s) which will be referenced in the agreement signed by both parties.

G. BONDS

1. The successful Proposer will be required to post and maintain a performance and payment bond for 100 percent (100%) of the total contract amount with the District. Bonds must be on District forms attached to this RFP as **Exhibit E - Bond Forms**.

IV. RFP RESPONSE SUBMITTAL INSTRUCTIONS AND INFORMATION

A. DISTRICT CONTACTS

All contact during the competitive process is to be through the contact listed on the first page of this RFP. The following persons are to be contacted only for the purposes specified below:

FOR INFORMATION REGARDING TECHNICAL SPECIFICATIONS:

Attn: Bert Mulchaey, Supervising Fisheries and Wildlife Biologist
EBMUD Fisheries and Wildlife Division
E-Mail: bert.mulchaey@ebmud.com
PHONE: (510) 287-2038

FOR INFORMATION ON THE CONTRACT EQUITY PROGRAM:

Attn: Contract Equity Office
PHONE: (510) 287-0114

AFTER AWARD:

Attn: Bert Mulchaey, Supervising Fisheries and Wildlife Biologist
EBMUD Fisheries and Wildlife Division
E-Mail: bert.mulchaey@ebmud.com
PHONE: (510) 287-2038

B. SUBMITTAL OF RFP RESPONSE

1. At this time, no hardcopy proposals will be accepted. Upload your RFP response in pdf format and prior to the bid due date/time RFP submittals, in their entirety, shall be emailed to bert.mulchaey@ebmud.com. The District's email has limitations on attachment size. Make sure your response is less than 25 megabytes. If the file exceeds the limit, you will need to send multiple emails. Proposers are solely responsible for ensuring timely delivery of the proposals. The District shall not be responsible for any issues related to transfer of files through email. You may call at (510)287-2038 to check receipt of the proposal.

2. All costs required for the preparation and submission of an RFP response shall be borne by the Proposer.
3. California Government Code Section 4552: In submitting an RFP response to a public purchasing body, the Proposer offers and agrees that if the RFP response is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2, commencing with Section 16700, of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the Proposer for sale to the purchasing body pursuant to the RFP response. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the Proposer.
4. Proposer expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms “claim” and “knowingly” are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act.
5. The RFP response shall remain open to acceptance and is irrevocable for a period of one hundred eighty (180) days, unless otherwise specified in the RFP documents.
6. It is understood that the District reserves the right to reject any or all RFP responses.

C. RESPONSE FORMAT

1. **Proposers shall not modify the existing text for any part of Exhibits A, B, C, D, E, or F or qualify their RFP responses. The proposal form in Exhibit A can be modified to accurately indicate quoted labor or project costs as long as all the pertinent information is present.**
2. RFP responses, in whole or in part, are NOT to be marked confidential or proprietary. The District may refuse to consider any RFP response or part thereof so marked. RFP responses submitted in response to this RFP may be subject to public disclosure. The District shall not be liable in any way for disclosure of any such records.



EXHIBIT A
RFP RESPONSE PACKET
RFP For – Tomato Stand Bridge Abutments RFP# 482-25-01

To: The EAST BAY MUNICIPAL UTILITY District (“District”)

From: _____
(Official Name of Proposer)

RFP RESPONSE PACKET GUIDELINES

- **SUBMITTAL SHALL CONTAIN THE FOLLOWING:**
 - **EXHIBIT A – RFP RESPONSE PACKET**
 - **INCLUDING ALL REQUIRED DOCUMENTATION AS DESCRIBED IN “EXHIBIT A-REQUIRED DOCUMENTATION AND SUBMITTALS”**
- **PROPOSERS THAT DO NOT COMPLY WITH THE REQUIREMENTS, AND/OR SUBMIT AN INCOMPLETE RFP RESPONSE MAY BE SUBJECT TO DISQUALIFICATION AND THEIR RFP RESPONSE REJECTED IN WHOLE.**
- **IF PROPOSERS ARE MAKING ANY CLARIFICATIONS AND/OR AMENDMENTS, OR TAKING EXCEPTION TO ANY PART OF THIS RFP, THESE MUST BE SUBMITTED IN THE EXCEPTIONS, CLARIFICATIONS, AND AMENDMENTS SECTION OF THIS EXHIBIT A – RFP RESPONSE PACKET. THE DISTRICT, AT ITS SOLE DISCRETION, MAY ACCEPT AMENDMENTS/EXCEPTIONS, OR MAY DEEM THEM TO BE UNACCEPTABLE, THEREBY RENDERING THE RFP RESPONSE DISQUALIFIED.**
- **PROPOSERS SHALL NOT MODIFY DISTRICT LANGUAGE IN ANY PART OF THIS RFP OR ITS EXHIBITS, NOR SHALL THEY QUALIFY THEIR RFP RESPONSE BY INSERTING THEIR OWN LANGUAGE OR FALSE CLAIMS IN THEIR RESPONSE. ANY EXCEPTIONS AND CLARIFICATIONS MUST BE PLACED IN THE “EXCEPTIONS/ CLARIFICATIONS” PAGE, NOT BURIED IN THE PROPOSAL ITSELF.**



PROPOSER INFORMATION AND ACCEPTANCE

1. The undersigned declares that all RFP documents, including, without limitation, the RFP, Addenda, and Exhibits, have been read and that the terms, conditions, certifications, and requirements are agreed to.
2. The undersigned is authorized to offer, and agrees to furnish, the articles and services specified in accordance with the RFP documents.
3. The undersigned acknowledges acceptance of all addenda related to this RFP. List Addenda for this RFP on the line below:

Addendum #	Date

4. The undersigned hereby certifies to the District that all representations, certifications, and statements made by the Proposer, as set forth in this RFP Response Packet and attachments, are true and correct and are made under penalty of perjury pursuant to the laws of California.
5. The undersigned acknowledges that the Proposer is, and will be, in good standing in the State of California, with all the necessary licenses, permits, certifications, approvals, and authorizations necessary to perform all obligations in connection with this RFP and associated RFP documents.
6. It is the responsibility of each Proposer to be familiar with all of the specifications, terms, and conditions and, if applicable, the site condition. By the submission of an RFP response, the Proposer certifies that if awarded a contract it will make no claim against the District based upon ignorance of conditions or misunderstanding of the specifications.
7. Patent indemnity: General or Professional Service Providers who do business with the District shall hold the District, its Directors, officers, agents, and employees harmless from liability of any nature or kind, including cost and expenses, for infringement or use of any patent, copyright or other proprietary right, secret process, patented or unpatented invention, article, or appliance furnished or used in connection with the contract or purchase order.
8. Insurance certificates are not required at the time of submission. However, by signing Exhibit A – RFP Response Packet, the Proposer agrees to meet the minimum insurance requirements stated in the RFP. This documentation must be provided to the District prior to execution of an agreement by the District

and shall include an insurance certificate which meets the minimum insurance requirements, as stated in the RFP.

9. The undersigned acknowledges that RFP responses, in whole or in part, are NOT to be marked confidential or proprietary. The District may refuse to consider any RFP response or part thereof so marked. RFP responses submitted in response to this RFP may be subject to public disclosure. The District shall not be liable in any way for disclosure of any such records.
10. The undersigned Proposer hereby submits this RFP response and binds itself to the District. The RFP, subsequent Addenda, Proposers Response Packet, and any attachments, shall be used to form the basis of a Contract, which once executed shall take precedence.
11. The undersigned acknowledges **ONE** of the following (please check only one box)*:
- ☐ Proposer is not an SBE nor a DVBE and is ineligible for any Proposal preference; **OR**
- ☐ Proposer is an SBE or DVBE as described in the Contract Equity Program (CEP) and Equal Employment Opportunity (EEO) Guidelines, and has completed the CEP and EEO forms at the hyperlink contained in the CEP and EEO section of this Exhibit A.

*If no box is checked it will be assumed that the Proposer is ineligible for Proposal preference, and none will be given. For additional information on SBE/DVBE Proposal preference please refer to the Contract Equity Program and Equal Employment Opportunity Guidelines at the above referenced hyperlink.

Official Name of Proposer (exactly as it appears on Proposer's corporate seal and invoice): _____

Street Address Line 1: _____

Street Address Line 2: _____

City: _____ State: _____ Zip Code: _____

Webpage: _____

Type of Entity / Organizational Structure (check one):

☐ Corporation

☐ Joint Venture

☐ Limited Liability Partnership

☐ Partnership

☐ Limited Liability Corporation

☐ Non-Profit / Church

☐ Other: _____

Jurisdiction of Organization Structure: _____

Date of Organization Structure: _____

Federal Tax Identification Number: _____

Department of Industrial Relations (DIR) Registration Number: _____

Primary Contact Information:

Name / Title: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____

Street Address Line 1: _____

City: _____ State: _____ Zip Code: _____

Does proposer or any employee/representative/service provider have any relatives currently employed with EBMUD? (This does not impact award of a qualified proposal; required reporting purposes only.)

☐ YES ☐ NO

If so, please list :

CONTRACTOR OR CONTRACTOR EMPLOYEE FIRST AND LAST NAME	DISTRICT EMPLOYEE FIRST AND LAST NAME	RELATIONSHIP

SIGNATURE: _____

Name and Title of Signer (printed): _____

Dated this _____ day of _____ 20_____



PROPOSAL FORM

Cost shall be submitted on this Proposal Form as is. The prices quoted shall not include Sales Tax or Use Tax; said tax, wherever applicable, will be paid by the District to the General or Professional Service Provider, if licensed to collect, or otherwise directly to the State.

No alterations or changes of any kind to the Proposal Form(s) are permitted. Proposer can submit tables of their own design but only as a supplement to the information required in the form below. RFP responses that do not comply may be subject to rejection in total. The cost quoted below shall be the cost the District will pay for the term of any contract that is a result of this RFP process.

Quantities listed herein are annual estimates based on past usage and are not to be construed as a commitment. No minimum or maximum is guaranteed or implied.

Description	Unit of Measure	Estimated Quantity	Unit Cost	Extended Cost
Senior Consultant (modify as needed to reflect personnel)	hour		\$	\$
Junior consultant (modify as needed to reflect personnel)	hour		\$	\$
TOTAL COST				\$



REQUIRED DOCUMENTATION AND SUBMITTALS

All of the specific documentation listed below is required to be submitted with the Exhibit A – RFP Response Packet. Proposers shall submit all documentation, in the order listed below, and clearly label each section of the RFP response with the appropriate title (i.e., Table of Contents, Letter of Transmittal, Key Personnel, etc.).

1. **Letter of Transmittal**: RFP response shall include a description of the Proposer's capabilities and approach in providing its services to the District, and provide a brief synopsis of the highlights of the RFP response and overall benefits to the District. This synopsis should not exceed three (3) pages in length and should be easily understood.
2. **Key Personnel**: RFP response shall include a complete list of all key personnel associated with the RFP. This list must include all key personnel who will provide services/training to District staff and all key personnel who will provide maintenance and support services. For each person on the list, the following information shall be included:
 - (a) The person's relationship with the Proposer, including job title and years of employment with the Proposer;
 - (b) The role that the person will play in connection with the RFP;
 - (c) The person's telephone number, fax number, and e-mail address;
 - (d) The person's educational background; and
 - (e) The person's relevant experience, certifications, and/or merits
3. **Description of the Proposed Services**: RFP response shall include a description of the terms and conditions of services to be provided during the contract term including response times. The description shall contain a basis of estimate for services including its scheduled start and completion dates, the number of Proposer's and District personnel involved, and the number of hours scheduled for each person. The description shall identify spare or replacement parts that will be required in performing maintenance services, the anticipated location(s) of the spare parts, and how quickly the parts shall be available for repairs. Finally, the description must: (1) specify how the services in the RFP response will meet or exceed the requirements of the District; (2) explain any special resources or approaches that make the services of the Proposer particularly advantageous to the District; and (3) identify any limitations or restrictions of the Proposer in providing the services that the District should be aware of in evaluating its RFP response to this RFP.
4. **Implementation Plan and Schedule**: The RFP response shall include an implementation plan and schedule. The plan shall include a detailed schedule indicating how the Proposer will ensure adherence to the timetables for the final services.

5. **Sustainability Statement:** Contractors shall submit a statement regarding any sustainable, environmental or socially responsible initiatives or practices that they or their suppliers engage in. This information can be in relation to the specific services or work products solicited via this RFP, or in relation to the manufacture, delivery, or business practices of your firm.
6. **References:**
- (a) Proposers must use the templates in the “References” section of this Exhibit A – RFP Response Packet to provide references.
 - (b) References should have similar scope, volume, and requirements to those outlined in these specifications, terms, and conditions.
 - Proposers must verify the contact information for all references provided is current and valid.
 - Proposers are strongly encouraged to notify all references that the District may be contacting them to obtain a reference.
 - (c) The District may contact some or all of the references provided in order to determine Proposer’s performance record on work similar to that described in this RFP. The District reserves the right to contact references other than those provided in the RFP response and to use the information gained from them in the evaluation process.
7. **Exceptions, Clarifications, Amendments:**
- (a) The RFP response shall include a separate section calling out all clarifications, exceptions, and amendments, if any, to the RFP and associated RFP documents, which shall be submitted with the proposer’s RFP response using the template in the “Exceptions, Clarifications, Amendments” section of this Exhibit A – RFP Response Packet.
 - (b) **THE DISTRICT IS UNDER NO OBLIGATION TO ACCEPT ANY EXCEPTIONS, AND SUCH EXCEPTIONS MAY BE A BASIS FOR RFP RESPONSE DISQUALIFICATION.**
8. **Contract Equity Program:**
- (a) Every proposer must fill out, sign, and submit the appropriate sections of the Contract Equity Program and Equal Employment Opportunity documents located at the hyperlink contained in the last page of this Exhibit A. Special attention should be given to completing Form P-25, "Employment Data and Certification". Any proposer needing assistance in completing these forms should contact the District's Contract Equity Office at (510) 287-0114 prior to submitting an RFP response.



REFERENCES
RFP For - Tomato Stand Bridge Abutments RFP# 482-25-01

Proposer Name: _____

Proposer must provide a minimum of 3 references.

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	



EXCEPTIONS, CLARIFICATIONS, AMENDMENTS
RFP For - Tomato Stand Bridge Abutments RFP# 482-25-01

Proposer Name: _____

List below requests for clarifications, exceptions, and amendments, if any, to the RFP and associated RFP documents, and submit with your RFP response.

The District is under no obligation to accept any exceptions and such exceptions may be a basis for RFP response disqualification.

Reference to:			Description
Page No.	Section	Item No.	
p. 23	D	1.c.	Proposer takes exception to...

*Print additional pages as necessary



CONTRACT EQUITY PROGRAM & EQUAL EMPLOYMENT OPPORTUNITY

The District's Board of Directors adopted the Contract Equity Program (CEP) to enhance equal opportunities for business owners of all races, ethnicities, and genders who are interested in doing business with the District. The program has contracting objectives, serving as the minimum level of expected contract participation for the three availability groups: white-men owned businesses, white-women owned businesses, and ethnic minority owned businesses. The contracting objectives apply to all contracts that are determined to have subcontracting opportunities, and to all General or Professional Service Providers regardless of their race, gender, or ethnicity.

All Contractors and their subcontractors performing work for the District must be Equal Employment Opportunity (EEO) employers and shall be bound by all laws prohibiting discrimination in employment. There shall be no discrimination against any person, or group of persons, on account of race, color, religion, creed, national origin, ancestry, gender including gender identity or expression, age, marital or domestic partnership status, mental disability, physical disability (including HIV and AIDS), medical condition (including genetic characteristics or cancer), genetic information, or sexual orientation.

Contractor and its subcontractors shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity, or national origin in the performance of this contract. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability.

All Contractors shall include the nondiscrimination provisions above in all subcontracts. Please include the required completed forms with your proposal. Non-compliance with the Guidelines may deem a proposal non-responsive, and therefore, ineligible for contract award. Your firm is responsible for:

- 1) Reading and understanding the CEP guidelines.
- 2) Filling out and submitting with your proposal the appropriate forms.

The CEP guidelines and forms can be downloaded from the District website at the following link:
<https://www.ebmud.com/business-center/contract-equity-program>

If you have questions regarding the Contract Equity Program, please call (510) 287-0114.



EXHIBIT B INSURANCE REQUIREMENTS

CONTRACTOR/COMPANY NAME: _____

PROPOSER shall take out and maintain during the life of the Agreement all insurance required and PROPOSER shall not commence work until such insurance has been approved by DISTRICT. The proof of insurance shall be on forms provided by DISTRICT directly following these Insurance Requirements.

PROPOSERS are not required to submit completed insurance verification documents with their bid but will be required to submit them upon notification of award. By signing Exhibit A – RFP Response Packet, the BIDDER agrees to meet the minimum insurance requirements stated in the RFP.

The following provisions are applicable to all required insurance:

- A. Prior to the beginning of and throughout the duration of Services, and for any additional period of time as specified below, CONTRACTOR shall, at its sole cost and expense, maintain insurance in conformance with the requirements set forth below.
- B. CONTRACTOR shall provide Verification of Insurance as required by this Agreement by providing the completed Verification of Insurance as requested below by signing and submitting Exhibit B (“Insurance Requirements”) to the DISTRICT. The Insurance Requirements may be signed by the insurance broker or the insurance broker’s agent (Insurance Broker/Agent) for the CONTRACTOR, or by an officer of the CONTRACTOR (Officer), or by the CONTRACTOR’s risk manager (Risk Manager). The Notice to Proceed shall not be issued, and CONTRACTOR shall not commence Services until a signed Verification of Insurance evidencing the specific coverages and limits required by this Agreement has been received by the DISTRICT.
- C. CONTRACTOR shall carry and maintain the minimum insurance requirements as defined in this Agreement. CONTRACTOR shall require any contractor/subcontractor to carry and maintain the minimum insurance required in this Agreement to the extent the insurance applies to the scope of the services to be performed by contractor/subcontractor.
- D. Receipt of a signed Verification of Insurance by the DISTRICT shall not relieve CONTRACTOR of any of the insurance requirements, nor decrease liability of CONTRACTOR.
- E. Insurance must be maintained, and an updated Verification of Insurance must be provided to the DISTRICT before the expiration of insurance by having the Insurance Broker/Agent, Officer, or Risk Manager update, sign and return the Insurance Requirements to the DISTRICT’s contract manager. The updated Insurance Requirements shall become a part of the Agreement but shall not require a change order to the Agreement. It is the CONTRACTOR’s sole responsibility to provide or to ensure that an updated Verification of Insurance is provided to the DISTRICT. The DISTRICT has no obligation to solicit, remind, prompt, request, seek, or otherwise obtain any updated Verification of Insurance, and any actual or alleged failure on the part of the DISTRICT to obtain any updated Verification of Insurance under this Agreement shall not in any way be construed to be a waiver of any right or remedy of the DISTRICT, in this or any regard.

- F. The insurance required hereunder may be obtained by a combination of primary, excess and/or umbrella insurance, and all coverages shall be at least as broad as the requirements listed in this Agreement.
- G. Any deductibles, self-insurance, or self-insured retentions (SIRs) applicable to the required insurance coverage must be declared to and accepted by the DISTRICT.
- H. At the option and request of the DISTRICT, CONTRACTOR shall provide documentation of its financial ability to pay the deductible, self-insurance, or SIR.
- I. CONTRACTOR is responsible for the payment of any deductibles or SIRs pertaining to the policies required under this Agreement. In the event CONTRACTOR is unable to pay the required SIR, CONTRACTOR agrees that such SIR may be satisfied, in whole or in part, by the DISTRICT as the additional insured at the DISTRICT's sole and absolute discretion, unless to do so would terminate or void the policy(ies).
- J. Unless otherwise accepted by the DISTRICT, all required insurance must be placed with insurers with a current A.M. Best's rating of no less than A- V.
- K. CONTRACTOR shall defend the DISTRICT and pay any damages as a result of failure to provide the waiver of subrogation from the insurance carrier required by this Agreement.
- L. For any coverage that is provided on a claims-made coverage form (which type of form is permitted only where specified), the retroactive date must be shown, must be before the date of this Agreement, and must be before the beginning of any Services related to this Agreement.
- M. For all claims-made policies the updated Verification of Insurance must be provided to the DISTRICT for at least three (3) years after expiration or termination of this Agreement.
- N. If claims-made coverage is canceled or is non-renewed and if the claims-made coverage is not replaced with another claims-made policy form with a retroactive date prior to the effective date of this Agreement and prior to the start of any Services related to this Agreement, CONTRACTOR must purchase an extended reporting period for a minimum of three (3) years after expiration or termination of the Agreement.
- O. In the event of a claim or suit, and upon request by the DISTRICT, CONTRACTOR agrees to provide a copy of the pertinent policy(ies) within 10 days of such request to the DISTRICT for review. Any actual or alleged failure on the part of the DISTRICT to request a copy of the pertinent policy(ies) shall not in any way be construed to be a waiver of any right or remedy of the DISTRICT, in this or any regard. Additionally, the DISTRICT may, at any time during CONTRACTOR's performance under this Agreement, request a copy of the Declarations pages and Schedule of Forms and Endorsements of any policy required to be maintained by CONTRACTOR hereunder, whether or not a suit or claim has been filed. Premium details may be redacted from any such documents requested.
- P. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained herein.
- Q. Where additional insured coverage is required, the additional insured coverage shall be primary and non-contributory and will not seek contribution from the DISTRICT's insurance or self-insurance.

- R. CONTRACTOR agrees to provide immediate Notice to the DISTRICT of any loss or claim against CONTRACTOR arising out of, pertaining to, or in any way relating to this Agreement or to Services performed under this Agreement. The DISTRICT assumes no obligation or liability by such Notice but has the right (but not the duty) to monitor the handling of any such claim(s) if the claim(s) is likely to involve the DISTRICT.
- S. It is the obligation of the CONTRACTOR to ensure all contractors/subcontractors performing services under this Agreement maintain the necessary coverages and limits. CONTRACTOR shall ensure that all contractors/subcontractors agree to the same indemnity obligation that CONTRACTOR agrees to in this Agreement based on the nature and scope of services being performed by each contractor/subcontractor. CONTRACTOR shall require that each contractor/subcontractor include the DISTRICT, its directors, officers, and employees as additional insureds on its liability policy(ies) (excepting Professional Liability and Workers' Compensation) for all ongoing and completed operations with coverage as broad as required of CONTRACTOR under this Agreement. Failure or inability to secure fully adequate insurance shall in no way relieve the CONTRACTOR or all contractors/subcontractors of the responsibility for its own acts or the acts of any contractors/subcontractors or any employees or agents of either. All contractors/subcontractors are to waive subrogation against the DISTRICT on all policies. CONTRACTOR shall be responsible for maintaining records evidencing contractors'/subcontractors' compliance with the necessary insurance coverages and limits, and such records shall be made available to the DISTRICT within 10 days upon request.
- T. It is CONTRACTOR's responsibility to ensure its compliance with the insurance requirements. Any actual or alleged failure on the part of the DISTRICT to obtain proof of insurance required under this Agreement shall not in any way be construed to be a waiver of any right or remedy of the DISTRICT, in this or any regard.
- U. Notice of Cancellation/Non-Renewal/Material Reduction. The insurance requirements hereunder are mandatory, and the DISTRICT may, at its sole and absolute discretion, terminate the services provided by CONTRACTOR, should CONTRACTOR breach its obligations to maintain the required coverage and limits set forth in this Agreement. No coverage required hereunder shall be cancelled, non-renewed or materially reduced in coverage or limits without the DISTRICT being provided at least thirty (30) days prior written notice, other than cancellation for the non-payment of premiums, in which event the DISTRICT shall be provided ten (10) days prior written notice. Replacement of coverage with another policy or insurer, without any lapse in coverage or any reduction of the stated requirements does not require notice beyond submission to the DISTRICT of an updated Verification of Insurance which shall be met by having the Insurance Broker/ Agent, or Officer, or Risk Manager update, sign and return the Insurance Requirements.

I. Workers' Compensation and Employer's Liability Insurance Coverage

- A. Workers' Compensation insurance including Employer's Liability insurance with minimum limits as follows:
- Coverage A. Statutory Benefits Limits
- Coverage B. Employer's Liability of not less than:
- | | |
|----------------------------|---------------------------|
| Bodily Injury by accident: | \$1,000,000 each accident |
| Bodily Injury by disease: | \$1,000,000 each employee |
| Bodily Injury by disease: | \$1,000,000 policy limit |

- B. If there is an onsite exposure of injury to CONTRACTOR, and/or contractor/subcontractor's employees under the U.S. Longshore and Harbor Workers' Compensation Act, the Jones Act, or under laws, regulations or statutes applicable to maritime employees, coverage is required for such injuries or claims.
- C. If CONTRACTOR is exempt from carrying Workers' Compensation Insurance, CONTRACTOR must return the completed Verification of Insurance confirming that CONTRACTOR has no employees and is exempt from the State of California Workers' Compensation requirements.
- D. If CONTRACTOR is self-insured with respect to Workers' Compensation coverage, CONTRACTOR shall provide to the DISTRICT a Certificate of Consent to Self-Insure from the California Department of Industrial Relations. Such self-insurance shall meet the minimum limit requirements and shall waive subrogation rights in favor of the DISTRICT as stated below in section "E."
- E. Waiver of Subrogation. Workers' Compensation policies, including any applicable excess and umbrella insurance, must contain a waiver of subrogation endorsement providing that CONTRACTOR and each insurer waive any and all rights of recovery by subrogation, or otherwise, against the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers. CONTRACTOR shall defend and pay any and all damages, fees, and costs, of any kind arising out of, pertaining to, or in any way relating to CONTRACTOR's failure to provide waiver of subrogation from the insurance carrier.

Verification of Workers' Compensation and Employer's Liability Insurance Coverage

☐ By checking the box and signing below, I hereby verify that the CONTRACTOR is exempt from the State of California's requirement to carry Workers' Compensation insurance.

As the CONTRACTOR's Insurance Broker/Agent, Officer, or Risk Manager, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Workers' Compensation insurance as required by this Agreement, including the relevant provisions applicable to all required insurance.

Self-Insured Retention: Amount: \$ _____

Policy Limit: \$ _____

Policy Number: _____

Policy Period: from _____ to _____

Insurance Carrier Name: _____

Insurance Broker/Agent or Officer or Risk Manager - Print Name: _____

Insurance Broker/Agent or Officer or Risk Manager's Signature: _____

II. Commercial General Liability Insurance (“CGL”) Coverage

- A. CONTRACTOR’s insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements. CGL insurance with minimum per occurrence and aggregate limits as follows:
 - Bodily Injury and Property Damage \$2,000,000 per occurrence & aggregate
 - Personal Injury/Advertising Injury \$2,000,000 per occurrence & aggregate
 - Products/Completed Operations \$2,000,000 per occurrence & aggregate
- D. Coverage must be on an occurrence basis and be as broad as Insurance Services Office (ISO) form CG 00 01.
- E. Coverage for Products, and Completed Operations, and Ongoing Operations must be included in the insurance policies and shall not contain any “prior work” coverage limitation or exclusion applicable to any Services performed by CONTRACTOR and/or contractor/subcontractor under this Agreement.
- F. There will be no exclusion for explosions, collapse, or underground liability (XCU).
- G. Insurance policies and Additional Insured Endorsement(s) shall not exclude liability and damages to work arising out of, pertaining to, or in any way relating to services performed by contractor/subcontractor on CONTRACTOR’s behalf.
- H. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONTRACTOR under this Agreement as an “insured contract.”
- I. Waiver of Subrogation. The policy shall be endorsed to include a Waiver of Subrogation ensuring that the CONTRACTOR and its insurer(s) waive any rights of recovery by subrogation, or otherwise, against the DISTRICT, its directors, board, and committee members, officers, officials, agents, volunteers, and employees. CONTRACTOR shall defend and pay any and all damages, fees, and costs, of any kind, arising out of, pertaining to, or in any way resulting from CONTRACTOR’s failure to provide the waiver of subrogation from its insurance carrier(s).
- J. Independent Contractor’s Liability shall not limit coverage for liability and/or damages arising out of, pertaining to, or in any way resulting from Services provided under this Agreement.
- K. To the fullest extent permitted by law, the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers must be covered as Additional Insureds on a primary and noncontributory basis on all underlying, excess and umbrella policies that shall be evidenced in each case by an endorsement. Coverage for the Additional Insureds must be as broad as ISO forms CG 20 10 (ongoing operations) and CG 20 37 (completed

operations) for liability arising in whole, or in part, from work performed by or on behalf of CONTRACTOR, or in any way related to Services performed under this Agreement.

- L. A severability of interest provision must apply for all the Additional Insureds, ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the policies' limit(s).

Verification of Commercial General Liability (CGL) Insurance Coverage

As the CONTRACTOR'S Insurance Broker/Agent, Officer, or Risk Manager, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Commercial General Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance:

Self-Insured Retention: Amount: \$ _____

Policy Limit: \$ _____

Policy Number: _____

Policy Period: from _____ **to** _____

Insurance Carrier Name: _____

Insurance Broker/Agent or Officer or Risk Manager - Print Name: _____

Insurance Broker/Agent or Officer or Risk Manager's Signature: _____

III. Business Auto Liability Insurance Coverage

- A. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements. Auto insurance with minimum coverage and limits as follows:
Each Occurrence Limit (per accident) and in the Aggregate: \$2,000,000
Bodily Injury and Property Damage: \$2,000,000
- D. Coverage must include either "owned, non-owned, and hired" autos or "any" automobile. This provision ensures the policy covers losses arising out of use of company-owned vehicles ("owned autos"), employee's personal autos ("non-owned autos" meaning not owned by company/insured) or autos that are rented or leased ("hired autos").

- E. If CONTRACTOR is transporting hazardous materials or contaminants, evidence of the Motor Carrier Act Endorsement-hazardous materials clean-up (MCS-90, or its equivalent) must be provided.
- F. If CONTRACTOR's Scope of Services under this Agreement exposes a potential pollution liability risk related to transport of potential pollutants, seepage, release, escape or discharge of any nature (threatened or actual) of pollutants into the environment arising out of, pertaining to, or in any way related to CONTRACTOR's and/or contractor's/subcontractor's performance under this Agreement, then Auto Liability Insurance policies must be endorsed to include Transportation Pollution Liability insurance. Alternatively, coverage may be provided under the CONTRACTOR's Pollution Liability Policies if such policy has no exclusions that would restrict coverage under this Agreement. Coverage shall also include leakage of fuel or other "pollutants" needed for the normal functioning of covered autos.
- G. To the fullest extent permitted by law, the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers must be covered as Additional Insureds on a primary and noncontributory basis on all underlying and excess and umbrella policies.
- H. A severability of interest provision must apply for all the Additional Insureds, ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the insurer's limits of liability.

Verification of Business Auto Liability Insurance Coverage

As the CONTRACTOR'S Insurance Broker/Agent, Officer, or Risk Manager, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Business Automobile Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance:

Self-Insured Retention: Amount: \$ _____

Policy Limit: \$ _____

Policy Number: _____

Policy Period: from _____ **to** _____

Insurance Carrier Name: _____

Insurance Broker/Agent or Officer or Risk Manager – Print Name: _____

Insurance Broker/Agent or Officer or Risk Manager's Signature: _____

IV. Pollution Liability Insurance Coverage

- A. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these

insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.

C. Minimum Requirements: Pollution Liability Insurance with minimum limits, as follows:

Each Claim or Occurrence Limit: \$2,000,000
Aggregate Limit: \$2,000,000

D. Coverage must be included for bodily injury and property damage, including coverage for loss of use and/or diminution in property value, and for clean-up costs arising out of, pertaining to, or in any way related to the actual, alleged or threatened discharge, dispersal, seepage, migration, release or escape of contaminants or pollutants, arising out of, pertaining to, or in any way resulting from any Services performed by CONTRACTOR under this Agreement; including any transportation of hazardous wastes, hazardous materials, or contaminants.

E. If Coverage is written on a claims-made form, the following shall apply:

1. The retroactive date must be shown and must be before the date of the Agreement or the beginning of the Services.
2. Insurance must be maintained, and evidence of insurance must be provided for a minimum of three (3) years after completion of the Services.
3. If coverage is canceled or non-renewed and not replaced with another claims-made policy form with a retroactive date prior to the effective date of the Agreement, CONTRACTOR must purchase an extended reporting period for a minimum of three (3) years after completion of the Services.

F. Insurance written on a claims-made basis shall include prior acts coverage sufficient to cover the services provided by CONTRACTOR under this Agreement.

Verification of Pollution Liability Insurance Coverage

As the CONTRACTOR'S Insurance Broker/Agent, Officer, or Risk Manager, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Pollution Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance.

Self-Insured Retention: Amount: \$ _____

Policy Limit: \$ _____

Policy Number: _____

Policy Period: from _____ **to** _____

Insurance Carrier Name: _____

Insurance Broker/Agent or Officer or Risk Manager - Print Name: _____

Insurance Broker/Agent or Officer or Risk Manager's Signature: _____

V. Excess and/or Umbrella Liability Insurance Coverage (Optional – See Paragraph A below)

- A. The insurance requirements set forth above may be satisfied by a combination of primary and excess or umbrella policies. Where excess or umbrella policies are used the following shall apply:
- B. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- C. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- D. Minimum Requirements: It is expressly understood by the parties that CONTRACTOR's Excess and/or Umbrella Liability policies shall, at minimum, comply with all insurance requirements set forth within this Agreement, and shall be at least as broad as coverage required of the underlying policies required herein.
 - 1. Coverage for Products, Completed Operations, and Ongoing Operations must be included in the insurance policies and shall not contain any "prior work" coverage limitation or exclusion applicable to any Services performed under this Agreement and, if it is a claims-made policy, it must be maintained for a minimum of three (3) years following final completion of the Services.
 - 2. There will be no exclusion for explosions, collapse, or underground damage (XCU).
 - 3. Insurance policies and Additional Insured Endorsements shall not exclude coverage for liability and damages from services performed by contractor/subcontractor on CONTRACTOR's behalf.
 - 4. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONTRACTOR under this Agreement as an "insured contract."
 - 5. Independent Contractor's Liability shall not limit coverage for liability and/or damage arising out of, pertaining to, or in any way related to Services provided under this Agreement.
 - 6. To the fullest extent permitted by law, the DISTRICT, its directors, officers, officials, agents, volunteers, and employees must be covered as Additional Insureds on a primary and noncontributory basis on all excess and umbrella policies. The Additional Insureds must be covered for liability arising in whole or in part from any premises, Products, Ongoing Operations, and Completed Operations by or on behalf of CONTRACTOR, in any way related to Services performed under this Agreement.
 - 7. A severability of interest provision must apply for all the Additional Insureds, ensuring that the CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the policy's limits.
 - 8. CONTRACTOR and its excess and/or umbrella Liability insurance coverage must waive any rights of subrogation against the DISTRICT, its directors, officers, officials, employees, agents,

and volunteers, and CONTRACTOR shall defend and pay any damages as a result of failure to provide the waiver of subrogation from the insurance carrier(s).

Verification of Excess and/or Umbrella Liability Insurance Coverage

As the CONTRACTOR'S Insurance Broker/Agent, Officer, or Risk Manager, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Excess and/or Umbrella Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance.

Excess/Umbrella Limits: Amount \$ _____

Policy Limit: \$ _____

Policy Number: _____

Policy Period from _____ **to** _____

Insurance Carrier Name: _____

Underlying Policy(ies) listed above to which Excess/Umbrella applies:

Insurance Broker/Agent or Officer or Risk Manager - Print Name: _____

Insurance Broker/Agent or Officer or Risk Manager's Signatu

EXHIBIT C

GENERAL REQUIREMENTS

GENERAL REQUIREMENTS

Effective: June 9, 2021

Supersedes: September 1, 2020

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1. DEFINITIONS

The following terms shall be given the meaning shown, unless context requires otherwise, or a unique meaning is otherwise specified.

- a. **"Change Order"** A Change Order is a written instrument used for modifying the contract with regards to the scope of Work, contract sum, and/or Contract Time. An approved Change Order is a Change Order signed by the District. An executed Change Order is a Change Order signed by both the District and the Contractor.
- b. **"Contract"** means the agreement between the District and Contractor as memorialized in the Contract Documents.

- c. **“Business Entity”** means any individual, business, partnership, joint venture, corporation, sole proprietorship, or other private legal entity recognized by statute.
- d. **“Buyer”** means the District’s authorized contracting official.
- e. **“Contract Documents”** comprise the entire agreement between the District and the Contractor and can include the District’s contract form if used, any purchase order, RFP, RFQ or Contractor response packet, and any addenda, appendices and District approved changes or amendments. The Contract Documents are intended to be complementary and include all items necessary for the Contractor’s proper execution and completion of the Work. Any part of the Work not shown or mentioned in the Contract Documents that is reasonably implied or is necessary or usual for proper performance of the Work, shall be provided by the Contractor at its expense.
- f. **“Contractor”** means the Business Entity with whom the District enters into a contractual agreement. Contractor shall be synonymous with “supplier”, “vendor”, “consultant” or other similar term.
- g. **“Day”** unless otherwise specified, days are calendar days, measured from midnight to the next midnight.
- h. **“District”** means the East Bay Municipal Utility District, its employees acting within the scope of their authority, and its authorized representatives.
- i. **“Goods”** means off the shelf software and all types of tangible personal property, including but not limited to materials, supplies, and equipment.
- j. **“Project Manager”** shall be the District designated individual responsible for administering and interpreting the terms and conditions of the Contract Documents, for matters relating to the Contractor’s performance under the Contract with the District, and for liaison and coordination between the District and Contractor.
- k. **“Work”** means all labor, tasks, materials, supplies, and equipment required to properly fulfill the Contractor’s obligations as required in the Contract Documents.
- l. **“Work Day”** Unless otherwise specified, work day includes all days of the year except Saturdays, Sundays and District holidays.

2. BOND

- a. When required in the District’s bid or proposal solicitation documents, the Contractor to whom award is made shall furnish a good and approved faithful performance bond and/or payment bond within ten business days after receiving the forms for execution.
- b. The bonds shall be executed by a sufficient, admitted surety insurer (i.e.: as listed on website <https://www.cslb.ca.gov/OnlineServices/InsuranceSearch/INSRequest.aspx>) admitted to transact such business in California by the California Department of Insurance. After acceptance of the bond(s) by the District, a copy of the bond(s) will be returned to the Contractor.
- c. If, during the continuance of the Contract, any of the sureties, in the opinion of the District, are or become irresponsible, the District may require other or additional sureties, which the Contractor shall furnish to the satisfaction of the District within ten

days after notice. If the Contractor fails to provide satisfactory sureties within the ten-day period, the Contract may be terminated for cause under Article 18.

3. CONTRACTOR'S FINANCIAL OBLIGATION

The Contractor shall promptly make payments to all persons supplying labor and materials used in the execution of the contract.

4. SAMPLES OR SPECIMENS

The Contractor shall submit samples or prepare test specimens of such materials to be furnished or used in the work as the Project Manager may require.

5. MATERIAL AND WORKMANSHIP

- a. All goods and materials must be new and of the specified quality and equal to approved sample, if samples have been required. In the event any goods or materials furnished, or services provided by the Contractor in the performance of the Contract fail to conform to the requirements, or to the sample submitted by the Contractor, the District may reject the same, and it shall become the duty of the Contractor to reclaim and remove the item promptly or to correct the performance of services, without expense to the District, and immediately replace all such rejected items with others conforming to the Contract. All work shall be done and completed in a thorough, workmanlike manner, notwithstanding any omission from these specifications or the drawings, and it shall be the duty of the Contractor to call attention to apparent errors or omissions and request instructions before proceeding with the work. The Project Manager may, by appropriate instructions, correct errors and supply omissions, which instructions shall be binding upon the Contractor as though contained in the original Contract Documents.
- b. All materials furnished and all Work must be satisfactory to the Project Manager. Work, material, or machinery not in accordance with the Contract Documents, in the opinion of the Project Manager, shall be made to conform.

6. DEFECTIVE WORK

The Contractor shall replace at its own expense any part of the work that has been improperly executed, as determined by the Project Manager. If Contractor refuses or neglects to replace such defective work, it may be replaced by the District at the expense of the Contractor, and its sureties shall be liable therefor.

7. WARRANTY

Contractor expressly warrants that all goods furnished will conform strictly with the specifications and requirements contained herein and with all approved submittals, samples and/or models and information contained or referenced therein, all affirmations of fact or promises, and will be new, of merchantable quality, free from defects in materials and workmanship, including but not limited to leaks, breaks, penetrations, imperfections, corrosion, deterioration, or other kinds of product deficiencies. Contractor expressly warrants that all goods to be furnished will be fit and sufficient for the purpose(s) intended. Contractor expressly warrants that all goods shall be delivered free from any security interest, lien or encumbrance of any kind, and free from any claim of infringement, copyright or other intellectual property violation, or other violation of laws, statutes, regulations, ordinances, rules, treaties, import

restrictions, embargoes or other legal requirements. Contractor guarantees all products and services against faulty or inadequate design, manufacture, negligent or improper transport, handling, assembly, installation or testing, and further guaranties that there shall be strict compliance with all manufacturer guidelines, recommendations, and requirements, and that Contractor guaranties that it will conform to all requirements necessary to keep all manufacturer warranties and guarantees in full force and effect. These warranties and guarantees are inclusive of all parts, labor and equipment necessary to achieve strict conformance, and shall take precedence over any conflicting warranty or guarantee. These warranties and guarantees shall not be affected, limited, discharged or waived by any examination, inspection, delivery, acceptance, payment, course of dealing, course of performance, usage of trade, or termination for any reason and to any extent. In the absence of any conflicting language as to duration, which conflicting language will take precedence as being more specific, Contractor's aforesaid warranties and guarantees shall be in full force and effect for a period of one year from the date of acceptance by the District but shall continue in full force and effect following notice from District of any warranty or guarantee issue, until such issue has been fully resolved to the satisfaction of District.

8. NOT USED

9. SAFETY AND ACCIDENT PREVENTION

In performing work under the Contract on District premises, Contractor shall conform to any specific safety requirements contained in the Contract or as required by law or regulation. Contractor shall take any additional precautions as the District may reasonably require for safety and accident prevention purposes. Any violation of such rules and requirements, unless promptly corrected, shall be grounds for termination of this Contract or Contractor's right to precede in accordance with the default provisions of the Contract Documents.

10. CHARACTER OF WORKFORCE

The Contractor shall employ none but skilled competent qualified personnel to perform the Work and shall maintain discipline and order in the conduct of the Work at all times.

11. PREVAILING WAGES & DIR REGISTRATION

- a. Please see www.dir.ca.gov for further information regarding the below.
- b. All Contractors and Subcontractors of any tier bidding on or offering to perform work on a public works project shall first be registered with the State Department of Industrial Relations (DIR) pursuant to Section 1725.5 of the Labor Code. No bid will be accepted, nor any contract entered into without proof of the Contractor and Subcontractors' current registration with the DIR (LC § 1771.1).
- c. All public works projects awarded after January 1, 2015, are subject to compliance monitoring and enforcement by the DIR (LC § 1771.4) and all Contractors are required
- d. to post job site notices, "as prescribed by regulation" (LC § 1771.4).
- e. To the extent applicable, pursuant to Section 1773 of the Labor Code, the District has obtained from the Director of Industrial Relations of the State of California, the general prevailing rates of per diem wages and the general prevailing rates for holiday and overtime work in the locality in which the Work is to be performed, for each craft, classification, or type of worker needed to execute the contract. Pursuant to Section

1773.2 of the Labor Code, a copy of the prevailing wage rates is on file with the District and available for inspection by any interested party at www.dir.ca.gov.

- f. The holidays upon which such rates shall be paid shall be all holidays recognized in the collective bargaining agreement applicable to the particular craft, classification, or type of worker employed on the Work.
- g. The Contractor shall post a copy of the general prevailing rate of per diem wages at the jobsite pursuant to Section 1773.2 of the Labor Code.
- h. Pursuant to Section 1774 of the Labor Code, the Contractor and any of its Subcontractors shall not pay less than the specified prevailing rate of wages to all workers employed in the execution of the contract.
- i. As set forth with more specificity in Section 1773.1 of the Labor Code, "per diem" wages include employer payments for health and welfare, pension, vacation, travel, subsistence and, in certain instances, apprenticeship or other training programs, and shall be paid at the rate and in the amount spelled out in the pertinent prevailing wage determinations issued by the Director of Industrial Relations.
- j. The Contractor shall, as a penalty to the State or the District, forfeit not more than the maximum set forth in Section 1775 of the Labor Code for each calendar day, or portion thereof, for each worker paid less than the prevailing rates for the work or craft in which the worker is employed under the contract by the Contractor or by any Subcontractor under him. The difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which such worker was paid less than the stipulated prevailing wage rate shall be paid to such worker by the Contractor.
- k. The specified wage rates are minimum rates only and the District will not consider and shall not be liable for any claims for additional compensation made by the Contractor because of its payment of any wage rate in excess of the general prevailing rates. All disputes in regard to the payment of wages in excess of those specified herein shall be adjusted by the Contractor at its own expense.
- l. General prevailing wage determinations have expiration dates with either a single
- m. asterisk or a double asterisk. Pursuant to California Code of Regulations, Title 8, Section 16204, the single asterisk means that the general prevailing wage determination shall be in effect for the specified contract duration. The double asterisk means that the predetermined wage modification shall be paid after the expiration date. No adjustment in the Contract Sum will be made for the Contractor's payment of these predetermined wage modifications.

12. PAYROLL RECORDS & ELECTRONIC SUBMISSION

If prevailing wages apply, Contractor and each Subcontractor, as appropriate, shall comply with the following:

- a. 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, apprentice, worker or other employee employed in connection with the

Work. The payroll records shall be certified and shall be available for inspection in accordance with the provisions of Section 1776 of the Labor Code. Certified payroll records shall be on the forms provided by the DIR or contain the same information required on the Department's form.

- b. The Contractor shall submit for each week in which any contract Work is performed a copy of all payroll records to the Project Manager. The Contractor shall be responsible for submission of copies of payroll records of all Subcontractors.
- c. The Contractor or Subcontractor shall certify the payroll records as shown on the DIR form. In addition, the records shall be accompanied by a statement signed by the Contractor or Subcontractor certifying that the classifications truly reflect the Work performed and that the wage rates are not less than those required to be paid.
- d. For public works projects awarded on or after April 1, 2015, or that are still ongoing after April 1, 2016, no matter when awarded, each Contractor and Subcontractor shall furnish the certified payroll related records as more specifically described above and in Labor Code section 1776 directly to the Labor Commissioner (see LC § 1771.4). These records shall be provided to the Labor Commissioner at least monthly or more frequently if required by the terms of the Contract. For exception on projects covered by collective bargaining agreements like a PLA, please see Labor Code section 1771.4.
- e. In the event of noncompliance with the requirements of Section 1776 of the Labor Code, the Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects such Contractor must comply with said Section. Should noncompliance still be evident after such 10-day period, the Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1776 of the Labor Code for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payments then due.
- f. The Contractor and every Subcontractor shall post at the workplace and comply with all required wage related workplace postings. Copies of the required postings may be downloaded or ordered electronically from the Department of Industrial Relations website at <http://www.dir.ca.gov/wpndb.html>.

13. HOURS OF LABOR

Pursuant to the provisions of Sections 1810, et seq. of the Labor Code and any amendments thereof:

- a. Eight hours of labor constitutes a legal day's Work under the contract.
- b. The time of service of any worker employed upon the work shall be limited and restricted to eight hours during any one calendar day, and forty hours during any one calendar week except as provided in Article 13.iv below.
- c. The Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1813 of the Labor Code for each worker employed in the execution of the contract by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any

calendar day and forty hours in any one calendar week in violation of this Article and the provisions of Labor Code, Sections 1810, et seq.

- d. Work performed by employees of the Contractor in excess of eight hours per day, and forty hours during any one calendar week, shall be permitted upon compensation for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay.
- e. The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by him in connection with the Work; the record shall be kept open at all reasonable hours to the inspection of the District and to the Division of Labor Standards Enforcement of the State of California.

14. EMPLOYMENT OF APPRENTICES

- a. In the performance of the contract, the Contractor and any Subcontractor shall comply with the provisions concerning the employment of apprentices in Section 1777.5 of the Labor Code and any amendments thereof.
- b. In the event the Contractor or any Subcontractor willfully fails to comply with the aforesaid section, such Contractor or Subcontractor shall be subject to the penalties for noncompliance in Labor Code, Section 1777.7.

15. CHANGES

- a. Changes in the Work can only be made in writing signed by an authorized employee of the District. If the change causes an increase or decrease in the contract sum, or a change in the time for performance under the Contract, an adjustment may be made as determined by the Project Manager.
- b. The District reserves the right to make changes in the design of materials, equipment, or machinery, to make alterations or additions to or deviations or subtractions from the Contract and any specifications and drawings, to increase or decrease the required quantity of any item or portion of the Work or to omit any item or portion of the Work, as may be deemed by the Project Manager to be necessary or advisable and to order such extra work as may be determined by the Project Manager to be required for the proper execution and completion of the whole Work contemplated. Any such changes will be ordered in writing by the Project Manager. The determination of the Project Manager on all questions relating to changes, including extra work, shall be conclusive and binding.
- c. Prior to issuing an amendment or change to the Contract, the Project Manager may request that the Contractor submit a proposal covering the changes. Within 10 business days of receiving the request, the Contractor shall submit its proposal to the Project Manager of all costs associated with the proposed amendment or change and any request for an extension of Contract time. Contractor's proposal shall include detailed estimates with cost breakdowns, including labor, material, equipment, overhead, and profit. Labor shall be broken down into hours and rate per hour. If applicable, the proposal shall include a breakdown for off-site labor (including factory labor, engineering, etc.). The Contractor's proposal shall include an analysis of schedule impact when the Contractor is requesting an adjustment in contract time. The

Contractor shall be responsible for any delay associated with its failure to submit its change proposal within the time specified. If the Project Manager decides not to issue an amendment or change after requesting a proposal from the Contractor, the Contractor will be notified in writing. The Contractor is not entitled to reimbursement for Change Order preparation costs if the Contractor's proposal is not accepted by the Project Manager.

- d. If the Contractor agrees with the terms and conditions of the approved Change Order, the Contractor shall indicate its acceptance by signing the original copy and returning it to the Project Manager within 10 Work Days after receipt or with reasonable promptness and in such sequence as to not delay the Work or activities of the District or of separate contractors, whichever is sooner. If notice of any change is required to be given to a surety by the provisions of any bond, the Contractor shall provide notice and the amount of each applicable bond shall be adjusted separately. Payment in accordance with the terms and conditions set forth in the executed Change Order shall constitute full compensation for all Work included in the Change Order and the District will be released from any and all claims for direct, indirect, and impact expenses and additional time impact resulting from the Work. If the Contractor disagrees with the terms and conditions of the approved Change Order, the Contractor shall indicate specific areas of disagreement and return the approved Change Order to the Project Manager with a detailed written dispute. No payment will be made on the disputed work until the approved Change Order is returned to the Project Manager. However, whether or not the Contractor agrees with the terms and conditions of an approved Change Order, the Contractor shall immediately revise its sequence of operations as required to facilitate timely completion of the changed work and shall proceed with the revised work sequence.
- e. The Project Manager may, after having received a written cost quotation from the Contractor, order the Contractor, in writing, to proceed with the work prior to issuance of an approved Change Order through a change directive. The change directive will authorize the Contractor to proceed with the work subject to the cost quotation submitted by the Contractor. Within five days following receipt of the change directive, the Contractor shall submit a detailed change proposal documenting the amount of compensation. The Project Manager will review the change proposal and, at its option, will either issue an approved Change Order for the work or direct the Contractor to perform the work through Force Account. Until the method of compensation is determined, and the approved Change Order is received, the Contractor shall keep full and complete time and material records of the cost of the ordered work and shall permit the Project Manager to have access to such records. An approved Change Order shall supersede any previously issued written change directive covering the same Work.

16. EFFECT OF EXTENSIONS OF TIME

The granting, or acceptance, of extensions of time to complete the Work or furnish the labor, supplies, materials or equipment, or any one of the aforementioned, will not operate as a release of Contractor or the surety on Contractor's faithful performance bond.

17. DELAYS

- a. The Contractor shall take reasonable precautions to foresee and prevent delays to the Work. When the Contractor foresees a delay event, and upon the occurrence of a delay

event, the Contractor shall immediately notify the Project Manager of the probability or the actual occurrence of a delay, and its cause. With respect to all delays (compensable, excusable or inexcusable), the Contractor shall reschedule the Work and revise its operations, to the extent possible, to mitigate the effects of the delay. Within 15 days from the beginning of a delay the Contractor shall provide the Project Manager with a detailed written description of the delay, its cause, its impact and the Contractor's mitigation plans. Failure to provide the notification required above waives the Contractor's right to any additional time or compensation resulting from the delay for whatever cause. The Project Manager will investigate the facts and ascertain the extent of the delay, and the Project Manager's findings thereon shall be final and conclusive, except in the case of gross error. An extension of time must be approved by the Project Manager to be effective, but an extension of time, whether with or without consent of the sureties, shall not release the sureties from their obligations, which shall remain in full force until the discharge of the contract.

- b. For inexcusable delays (delays caused by circumstances within the Contractor's control, the control of its subcontractors or supplies of any tier, or within the scope of the Contractor's contract responsibilities) the Contractor shall not be entitled to an extension of time or additional compensation for any loss, cost, damage, expense or liability resulting directly or indirectly from the inexcusable delay.
- c. For excusable delays (delays to completion of the Work within the time limits set forth in the Contract Documents directly caused by events beyond the control of both the Contractor and the District, which delay is not concurrent with an inexcusable delay and which could not have been avoided by the Contractor through reasonable mitigation measures the Project Manager will grant the Contractor an extension of time in an amount equal to the period of Excusable Delay based on the analysis of schedule impact and delay analysis diagram, which shall be the Contractor's sole and exclusive remedy for such delay. Excusable Delays shall include labor strikes, adverse weather, and Acts of God.
- d. For compensable delays (delays to completion of the Work within the time limits set forth in the Contract Documents that could not be avoided by Contractor mitigation, caused directly and solely by the District or by causes within the exclusive control of the
- e. District, and which were not concurrent with any other type of delay) the Project
- f. Manager will grant the Contractor an extension of the time to perform under the Contract and compensation in an amount that represents the Contractor's actual direct costs incurred as a direct result of the compensable delay. The Contractor may recover its direct costs only and may not recover (and waives) all other types of indirect, consequential, special and incidental damages.
- g. For concurrent delays (two or more independent causes of delay directly preventing the Contractor from completing the Work within the time limits set forth in the Contract Documents where the delays occur at the same time during all or a portion of the delay period being considered, and where each of the delays would have caused delay to the Contractor even in the absence of any of the other delays, and none of the delays could have been avoided by Contractor mitigations) the following rules apply:

- i. One or more of the concurrent delays are excusable or compensable, then the period of concurrent delay will be treated as an excusable delay; and
- ii. All of the concurrent delays are inexcusable, then the period of concurrent delay will be inexcusable.

18. TERMINATION

a. Termination by the District for Cause:

- i. District may terminate the Contractor's right to proceed under the Contract, in whole or in part, for cause at any time after the occurrence of any of the following events, each of which constitutes a default:
 1. The Contractor becomes insolvent or files for relief under the bankruptcy laws of the United States.
 2. The Contractor makes a general assignment for the benefit of its creditors or fails to pay its debts as the same become due.
 3. A receiver is appointed to take charge of the Contractor's property.
 4. The Contractor fails to supply skilled supervisory personnel, an adequate number of properly skilled workers, proper materials, or necessary equipment to prosecute the Work in accordance with the Contract Documents.
 5. The Contractor fails to make progress so as to endanger performance of the Work within the contractually required time.
 6. The Contractor disregards legal requirements of agencies having jurisdiction over the Work, the Contractor, or the District.
 7. The Contractor fails to provide the District with a written plan to cure a District identified default within five business days after the District's request for a plan to cure; the District does not accept the Contractor's plan for curing its default; or the Contractor does not fully carry out an accepted plan to cure.
 8. The Contractor abandons the Work. Abandonment is conclusively presumed when the District requests a written plan to cure a default and the Contractor does not submit the plan within five business days of the District's request.
 9. The Contractor materially fails to meet its obligations in accordance with the Contract Documents.
 10. The Contractor is in default of any other material obligation under the Contract Documents.
- ii. If any of the above events occur, the District may, in its discretion, require that the Contractor submit a written plan to cure its default, which plan must be provided to the District within 5 business days of the request and must include a realistic, executable plan for curing the noted defaults.

- iii. Upon any of the occurrences referred to in Article 18.a.i. above, the District may, at its election and by notice to the Contractor, terminate the Contract in whole or in part; accept the assignment of any or all of the subcontracts; and then complete the Work by any method the District may deem expedient. If requested by the District, the Contractor shall remove any part or all of the Contractor's materials, supplies, equipment, tools, and machinery from the site of the Work within seven days of such request; and, if the Contractor fails to do so, the District may remove or store, and after 90 days sell, any of the same at the Contractor's expense.
- iv. No termination or action taken by the District after termination shall prejudice any other rights or remedies of the District provided by law or by the Contract Documents.
- v. Conversion: If, after termination for other than convenience, it is determined that the Contractor was not in default or material breach, or that the default or material breach was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for convenience pursuant to Article 18.b. below.

b. Termination by the District for Convenience:

- i. The District may, at its option, and for its convenience, terminate the Contract at any time by giving written notice to the Contractor specifying the effective date of termination. Upon such termination, the Contractor agrees to comply with the notice and further agrees to waive any claims for damages, including loss of anticipated profits, on account of the termination; and, as the sole right and remedy of the Contractor, the District shall pay the Contractor as set forth below.
- ii. Upon receipt of a notice of termination for convenience, the Contractor shall, unless the notice directs otherwise, do the following:
 - 1. Immediately discontinue its performance of the Contract to the extent specified in the notice.
 - 2. Place no further orders or subcontracts for materials, equipment, services, or facilities, except as may be necessary for completion of a portion of the Work that is not discontinued or that is necessary for an orderly cessation of the Work.
 - 3. Promptly cancel, on the most favorable terms reasonably possible, all subcontracts to the extent they relate to the performance of the discontinued portion of the Work.
 - 4. Thereafter, do only such Work as may be necessary to preserve and protect Work already in progress and to protect materials, plants, and equipment in transit to or on the site of performance.
- iii. Upon such termination for convenience, the District will pay to the Contractor the sum of the following:

1. The amount of the contract sum allocable to the portion of the Work properly performed by the Contractor as of the effective date of termination, less sums previously paid to the Contractor.
 2. Previously unpaid costs of any items delivered to the project site that were already fabricated for subsequent incorporation into the Work.
 3. Any proven losses with respect to materials and equipment directly resulting from the termination.
 4. Reasonable demobilization costs.
- iv. The above reimbursement is the sole and exclusive remedy to which the Contractor is entitled in the event the contract is terminated for convenience; and the Contractor expressly waives any other claims, damages, demands, compensation or recovery related to this contract or project. The Contractor agrees to sign a general release incorporating this waiver.
- c. Effect of Termination: Upon termination, the obligations of the Contract shall continue as to portions of the Work already performed and, subject to the Contractor's obligations under Article 18.b.ii, as to bona fide obligations assumed by the Contractor prior to the date of termination.
- d. Force Majeure: If the contract is suspended or terminated by the District because Contractor's performance is prevented or delayed by an event including an irresistible, superhuman cause, or by the act of public enemies of the State of California or of the United States ("Force Majeure"), the Contractor will be paid for Work performed prior to the Force Majeure event at either (i) the unit prices named in the Contract; or (ii) in the event no unit prices are named, a sum equal to the percentage of the total contract amount that matches the percentage of the total contract Work performed prior to the Force Majeure event.

19. DAMAGES

All losses or damages to material or equipment to be furnished pursuant to the Contract Documents occurring prior to receipt and final acceptance of the Work shall be sustained by the Contractor. The Contractor shall sustain all losses arising from unforeseen obstructions or difficulties, either natural or artificial, encountered in the prosecution of the Work, or from any action of the elements prior to final acceptance of the work, or from an act or omission on the part of the Contractor not authorized by the Contract Documents.

20. ORDER OF PRECEDENCE

- a. In the case of conflicts, errors, or discrepancies in any of the Contract Documents, the order of precedence is as follows. Within the same order of precedence, specific requirements shall take precedence over general requirements.
- i. Approved Change Orders.
 - ii. Addenda.
 - iii. RFQ or RFP.
 - iv. Referenced Standard Specifications and Drawings.
 - v. Contractor's Response Packet.

- b. With reference to drawings:
 - i. Numerical dimensions govern over scaled dimensions.
 - ii. Detailed drawings govern over general drawings.
 - iii. Addenda/Change Order drawings govern over contract drawings.
 - iv. Contract drawings govern over standard drawings.
 - v. Notes apply only to the drawing where the notes appear, unless classified as “typical” or intended to apply elsewhere in which case they apply to all drawings where the conditions or circumstance noted occurs.
 - vi. Typical details apply to all drawings unless a specific different detail is shown.

21. INDEMNIFICATION

Contractor expressly agrees to defend, indemnify, and hold harmless DISTRICT and its Directors, officers, agents and employees from and against any and all loss, liability, expense, claims, suits, and damages, including attorneys’ fees, arising out of or resulting from Contractor's, its associates’, employees’, subconsultants’, or other agents’ negligent acts, errors or omissions, or willful misconduct, in the operation and/or performance under this Agreement.

22. PROHIBITION OF ASSIGNMENT

The Contractor shall not assign, transfer, or otherwise dispose of any of its rights, duties or obligations under this Contract. This prohibition does not apply to the District. The District retains the right to assign this Contract in whole or in part at any time upon reasonable terms.

23. NEWS RELEASES

The Contractor, its employees, subcontractors, and agents shall not refer to the District, or use any logos, images, or photographs of the District for any commercial purpose, including, but not limited to, advertising, promotion, or public relations, without the District's prior written consent. Such written consent shall not be required for the inclusion of the District's name on a customer list.

24. SEVERABILITY

Should any part of the Contract be declared by a final decision by a court or tribunal of competent jurisdiction to be unconstitutional, invalid or beyond the authority of either party to enter into or carry out, such decision shall not affect the validity of the remainder of the Contract, which shall continue in full force and effect, provided that the remainder of the Contract can be interpreted to give effect to the intentions of the parties.

25. COVENANT AGAINST GRATUITIES

The Contractor warrants that no gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the District with a view toward securing the Contract or securing favorable treatment with respect to any determinations concerning the performance of the Contract. For breach or violation of this warranty, the District shall have the right to terminate the Contract, either in whole or in part, and any loss or damage sustained by the District in procuring on the open market any items which Contractor agreed to supply shall be borne and paid for by the Contractor. The rights and remedies of the District provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or in equity.

26. RIGHTS AND REMEDIES OF THE DISTRICT

The rights and remedies of the District provided herein shall not be exclusive and are in addition to any other rights and remedies provided by law or under the Contract.

27. WAIVER OF RIGHTS

Any action or inaction by the District or the failure of the District on any occasion, to enforce any right or provision of the Contract, shall not be construed to be a waiver by the District of its rights and shall not prevent the District from enforcing such provision or right on any future occasion. Rights and remedies are cumulative and are in addition to any other rights or remedies that the District may have at law or in equity.

28. CONFIDENTIALITY

Contractor agrees to maintain in confidence and not disclose to any person or entity, without the District's prior written consent, any trade secret or confidential information, knowledge or data relating to the products, process, or operation of the District. Contractor further agrees to maintain in confidence and not to disclose to any person or entity, any data, information, technology, or material developed or obtained by Contractor during the term of the Contract. The covenants contained in this paragraph shall survive the termination of this Contract for whatever cause.



EXHIBIT D

IRAN CONTRACTING ACT CERTIFICATION

Pursuant to Public Contract Code (PCC) § 2204, an Iran Contracting Act Certification is required for solicitations of goods or services of \$1,000,000 or more.

To submit a bid or proposal to East Bay Municipal Utility District (District), you must complete **ONLY ONE** of the following two paragraphs. To complete paragraph 1, check the corresponding box **and** complete the certification for paragraph 1. To complete paragraph 2, check the corresponding box and attach a copy of the written permission from the District.

- ☐ 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.

CERTIFICATION FOR PARAGRAPH 1:

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY, that I am duly authorized to legally bind the proposer/bidder to the clause in paragraph 1. This certification is made under the laws of the State of California.

Firm: _____

By: _____ Date: _____
(Signature of Bidder)

Title: _____

Signed at: _____ County, State of: _____

OR

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

EXHIBIT E

BONDS



DATE _____

PAYMENT BOND

CONTRACTOR (Name and California address where service may be effected)

SURETY (Name and California address where service may be effected)

AMOUNT OF BOND (Sum in words and figures)

CONTRACT DOCUMENTS (As named in the Contract)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, WHEREAS, the contractor named above, hereinafter called the Contractor, has this day entered into a Contract with East Bay Municipal Utility District, hereinafter called the District, to perform and complete the work set forth in the Contract Documents named in the Contract, all now on file in the office of the Secretary of the District, as will more fully appear by reference to said Contract, which is made a part hereof; and

WHEREAS, Sections 9550 to 9566 inclusive of the Civil Code of the State of California, and any amendments thereof, require contractors upon public work to file with the body by whom such contract was awarded a good and sufficient bond to secure the claims to which reference is made in said sections, NOW THESE PRESENTS

WITNESSETH: That the Contractor, as Principal, and the Surety named above, as Surety, are held and firmly bound unto any and all materialmen, persons, firms, or corporations furnishing materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, and to all persons, firms or corporations renting or hiring implements or machinery for or contributing to the said work to be done and to all persons who perform work or labor of any kind or nature thereon, or in connection therewith, and to all persons who supply both work and materials, in the sum entered on the first page hereof, lawful money of the United States of America, being not less than the total amount payable by the terms of said Contract, for which payment well, truly and promptly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly, and severally, firmly by these presents.

PAYMENT BOND

The condition of the above obligation is such that if the Contractor, or the Contractor’s subcontractors, fail to pay for any materials, provisions or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, the Surety will pay for the same, in an amount not exceeding the sum specified in this Bond, provided that any and all claims hereunder shall be filed and proceedings had in connection therewith as required by the provisions of said Sections 9550 to 9566 inclusive of the Civil Code of the State of California, and any amendments thereof: PROVIDED ALSO, that in case suit is brought upon this Bond a reasonable attorney’s fee shall be awarded by the court to the prevailing party in said suit, said attorney’s fee to be fixed as costs in said suit, and to be included in the judgment therein rendered.

No prepayment or delay in payment and no change, extension, addition, or alteration of any provision of said Contract or Contract Documents agreed to between the Contractor and the District, and no forbearance on the part of the District, shall operate to release the Surety from liability on this Bond, and consent to make such alterations without further notice to or consent by the Surety is hereby given, and the Surety hereby waives the provisions of Section 2819 of the Civil Code of the State of California.

Dated the day and year entered on the first page hereof.

Each signator to this bond hereby declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Contractor

By _____

*Title _____

By _____

**Title _____

(SEAL OF SURETY)

Surety

By _____

Title _____

Note: The signature of the Surety on this bond must be acknowledged before a Notary Public. An executed Power of Attorney indicating that the Surety’s representative is authorized to bind the Surety must accompany this bond.

The foregoing Bond was accepted and approved this _____ day of _____, 20 _____

_____, East Bay Municipal Utility District

Specifications / Proposal No. _____

*If corporation, Corporate President or CEO; if Partnership, Partner.
**Corporate Secretary or financial officer.



DATE _____

FAITHFUL PERFORMANCE BOND

CONTRACTOR (Name and California address where service may be effected)

SURETY (Name and California address where service may be effected)

AMOUNT OF BOND (Sum in words and figures)

CONTRACT DOCUMENTS (As named in the Contract)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, the contractor named above, hereinafter called the Contractor, as Principal, and the Surety named above, as Surety, are held and firmly bound unto the East Bay Municipal Utility District, hereinafter called the District, in the sum entered above, lawful money of the United States of America, for the payment of which sum well and truly to be made to the District, we, and each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

The condition of the above obligation is such that whereas the Contractor and the District entered into a Contract of even date herewith, by the terms and conditions of which the Contractor agreed to perform and complete the work, or manufacture, complete, and deliver the material or equipment, set forth in the Contract Documents named in the Contract, all now on file in the office of the Secretary of the District, as will more fully appear by reference to said Contract, which is made a part of this bond;

FAITHFUL PERFORMANCE BOND

NOW, THEREFORE, if the Contractor shall well and truly carry out, execute and perform all things by the Contractor to be carried out, executed and performed, according to the terms and conditions of said Contract, including any and all warranty and guaranty obligations contained therein, then this obligation shall become null and void, otherwise to remain in full force and effect throughout the period of performance, including any warranty or guaranty period.

No prepayment or delay in payment, and no change, extension, addition, or alteration of any provision of said Contract or Contract Documents agreed to between the Contractor and the District, and no forbearance on the part of the District shall operate to release the Surety from liability on this Bond, and consent to make such alterations without further notice to or consent by the Surety is hereby given, and the Surety hereby waives the provisions of Section 2819 of the Civil Code and Section 359.5 of the Code of Civil Procedure of the State of California.

Each signator to this bond hereby declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated the day and year entered on the first page hereof.

Contractor

By _____

*Title _____

By _____

**Title _____

(SEAL OF SURETY)

Surety

By _____

Title _____

Note: The signature of the Surety on this bond must be acknowledged before a Notary Public. An executed Power of Attorney indicating that the Surety's representative is authorized to bind the Surety must accompany this bond.

The foregoing Bond was accepted and approved this _____ day of _____, 20 _____

_____, East Bay Municipal Utility District

Specifications / Proposal No. _____

*If corporation, Corporate President or CEO; if Partnership, Partner.

**Corporate Secretary or financial officer.

EXHIBIT F

**CONSTRUCTION DRAWINGS AND
SPECIFICATIONS**

TOMATO STAND FISH PASSAGE

CONTRA COSTA COUNTY, CA

90% DESIGN (NOT FOR CONSTRUCTION) | APRIL 22, 2025

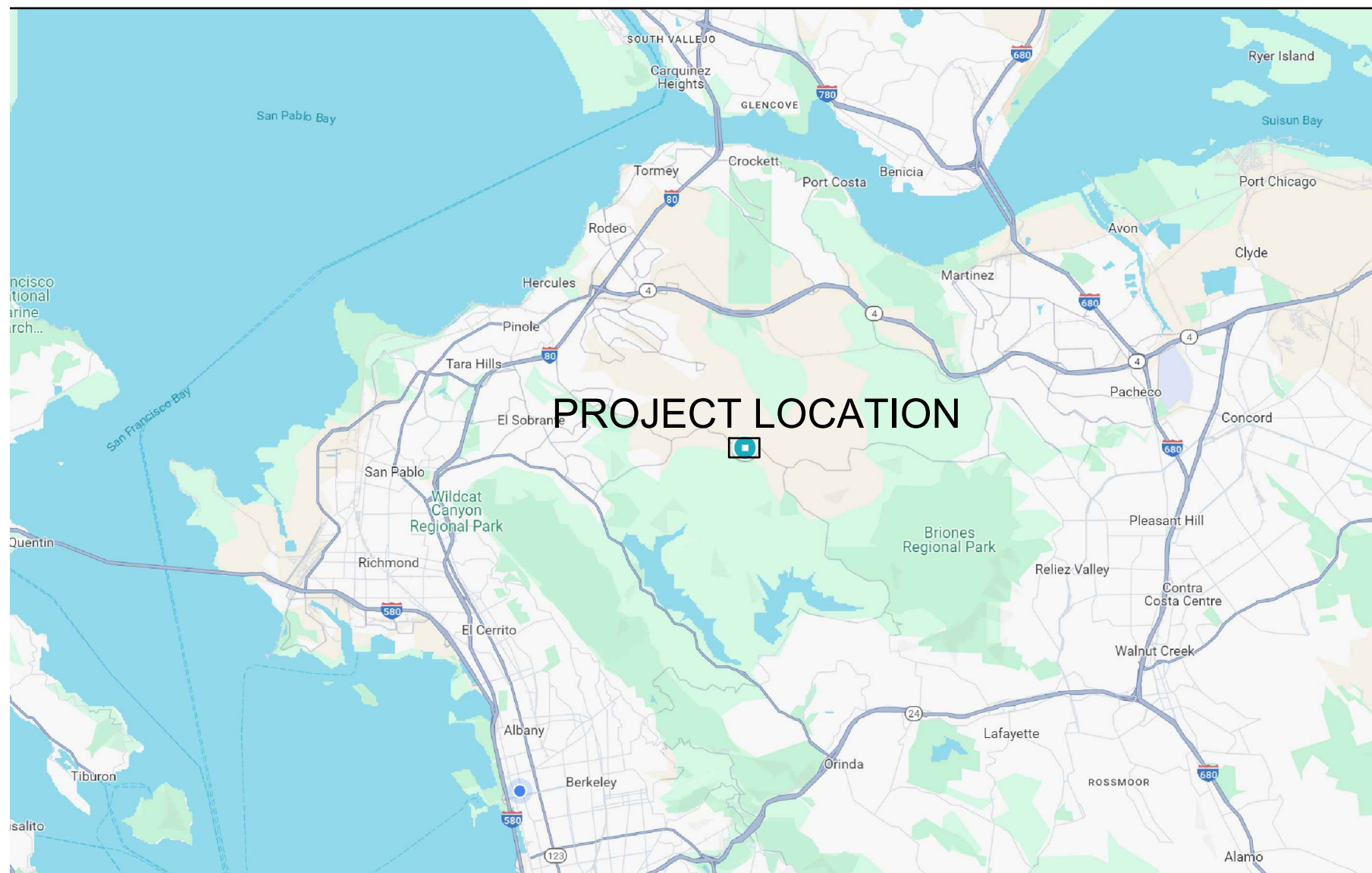
CLIENT

EAST BAY MUNICIPAL UTILITY DISTRICT:
BERT MULCHAEY, SUPERVISING FISHERIES
AND WILDLIFE BIOLOGIST
500 SAN PABLO DAM RD.
ORINDA, CA 94563
(510) 685-3106

CONSULTANTS

LANDSCAPE ARCHITECTURE AND ENGINEERING:
RESTORATION DESIGN GROUP, INC.
ERIK STROMBERG, PROJECT MANAGER
800 HEARST AVE.
BERKELEY, CA 94710
(510) 644-2798

PROJECT LOCATION



CONSULTANTS

BRIDGE DESIGN AND ENGINEERING:
QRS, LLC.
CHRIS BOYD, PROJECT MANAGER
3380 AMERICANA TERRACE
BOISE, ID 83706
(208) 342-0091

GEOTECHNICAL ENGINEERING:
ATLAS TECHNICAL CONSULTANTS, LLC
MANUEL ZEA, PE
2001 CROW CANYON ROAD, SUITE 210
SAN RAMON, CA 94583

SURVEYING:
BELLECCI & ASSOCIATES, INC.
ALEX FONG, PLS
2290 DIAMOND BLVD., SUITE 100
CONCORD, CA 94520

SHEET LIST TABLE

SHEET #	SHEET TITLE
T-1	COVER
T-2	SURVEY
C-1	DEMOLITION
C-2	GRADING
C-3	CHANNEL LAYOUT
C-4	BRIDGE MATERIALS & LAYOUT
C-5	PROFILES
C-6	SECTIONS
C-7	SECTIONS
C-8	CIVIL DETAILS
C-9	CIVIL DETAILS
L-1	REVEGETATION
L-2	LANDSCAPE DETAILS
S-1	STRUCTURAL NOTES
S-2	PLAN AND ELEVATION
S-3	FOUNDATION LAYOUT
S-4	SECTION AND DETAILS 1

ABBREVIATIONS

AP	ANGLE POINT
BB	BOTTOM OF BANK
BKF	BANKFULL
CLR	CLEAR
CL	CENTERLINE
EC	EDGE OF CHANNEL
(E)	EXISTING
FG	FINISH GRADE
FL	FLOW LINE
FP	FLOODPLAIN
FS	FINISH SURFACE
GB	GRADE BREAK
HP	HIGH POINT
LB	LEFT BANK
LP	LOW POINT
L.O.W.	LIMIT OF WORK
MM	MEET AND MATCH
N.I.C.	NOT IN CONTRACT
OC	ON CENTER
O.R.	OWNER'S REPRESENTATIVE
PA	PLANTING AREA
PP	PRESERVE AND PROTECT
RB	RIGHT BANK
R.O.W	RIGHT-OF-WAY
SSD	SEE STRUCTURAL DRAWINGS
TB	TOP OF BANK
TBD	TO BE DETERMINED
TYP.	TYPICAL
UON	UNLESS OTHERWISE NOTED
WPCP	WATER POLLUTION CONTROL PLAN
WSE	WATER SURFACE ELEVATION



**2 WORKING DAYS
BEFORE YOU DIG CALL USA
TOLL FREE 811**

REVISIONS

NO	DATE	DESCRIPTION	APPR

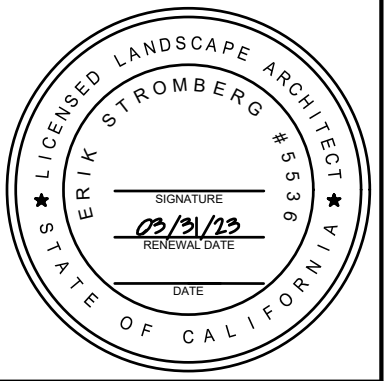
TOMATO STAND FISH PASSAGE

90% DESIGN (NOT FOR CONSTRUCTION)

COVER



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www.restorationdesigngroup.com



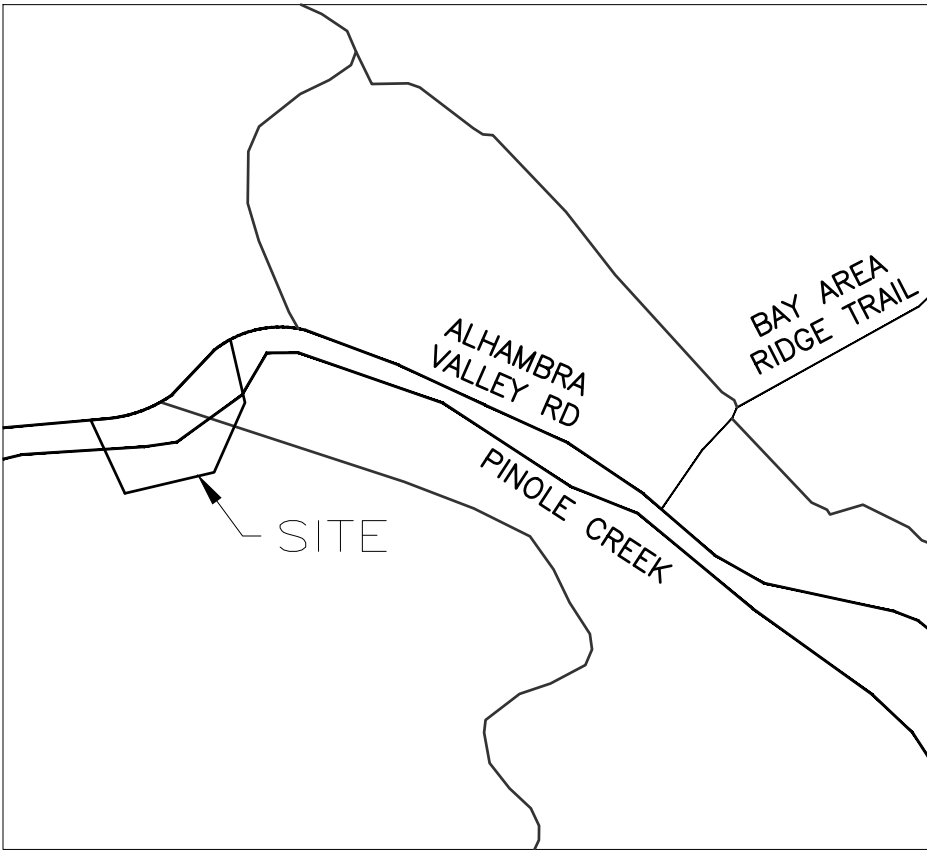
DESIGN BY	ES, MT
DRAWN BY	JH, HH
CHECKED BY	ES, MT
SCALE	NTS
DATE	APRIL 22, 2025
SHEET	T-1

OF 17

C:\USERS\HANSEN\RESTORATION DESIGN GROUP\PROJECTS - DOCUMENTS\TOMATO STAND FISH PASSAGE\04 AUTOCAD\WORKING DRAWINGS\SHEET\TOM-LS-SRVY.DWG PLOTTED ON: 4/22/2025



PLAN
1" = 10'



VICINITY MAP
NOT TO SCALE

DATUM NOTE:
HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON REAL TIME GPS/GNSS NETWORK OBSERVATIONS PROVIDED BY CALIFORNIA DRAFTING AND SURVEY SUPPLY, CALIFORNIA COORDINATE SYSTEM ZONE III, NAD83, NAVD88 DATUM EPOCH 2011.

CONTROL POINTS SET FOR THIS SURVEY

1	2180152.50'	6067111.22'	301.19'	MAG NAIL
3	2180047.51'	6067397.63'	306.59'	MAG NAIL
5	2180165.81'	6066987.81'	301.49'	MAG NAIL

THIS TOPOGRAPHIC SURVEY WAS DONE BY A FIELD CREW UNDER THE SUPERVISION OF ALEXANDER FONG, JULY 9, 2023.

ALEXANDER V. FONG
PLS 9252

DATE:

LEGEND

- < / T / Y ANGLE POINT
- AC ASPHALT CONCRETE
- BGN BEGINNING
- CL CENTERLINE
- CP CONTROL POINT
- DL DAYLIGHT
- EP/EOP EDGE OF PAVEMENT
- FEN BRB FENCE BARBED WIRE
- FL FLOW LINE
- G GROUND
- PIPE CMP CORRUGATED METAL PIPE
- POC POINT ON CURB
- POL POINT ON LINE
- TOE BOTTOM OF DITCH
- TOP TOP OF PIPE OR TOP
- TREE EUC EUCLYPTUS TREE
- TREE MULTI MULTIPLE TREES
- LANDSCAPE TREE LANDSCAPE TREE
- SURVEY SET 60D NAIL

NO	DATE	DESCRIPTION	APPR

TOMATO STAND FISH PASSAGE

90% DESIGN (NOT FOR CONSTRUCTION)

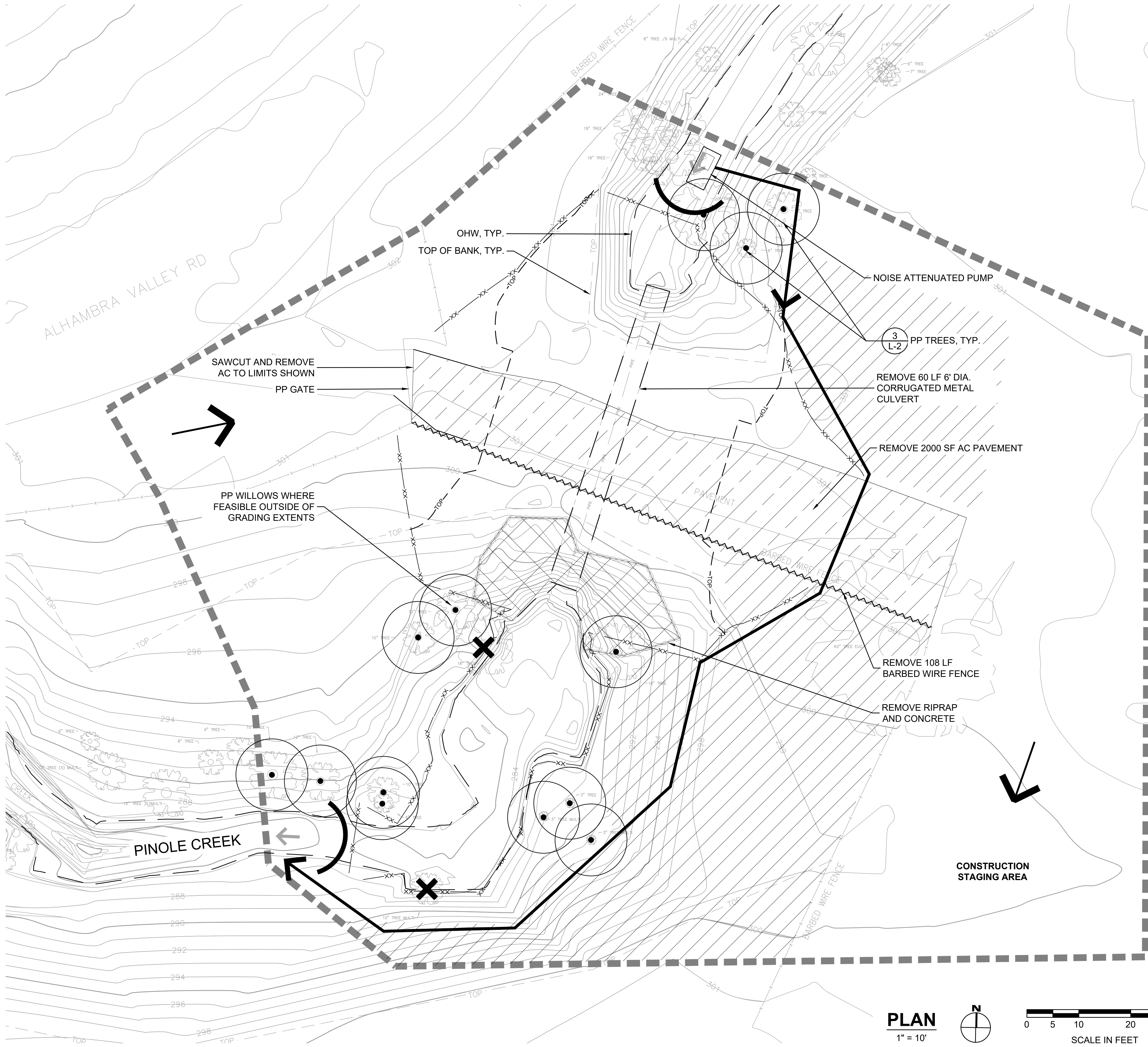
SURVEY



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DESIGN BY	MT, ES
DRAWN BY	JH, HH
CHECKED BY	MT, ES
SCALE	1" = 10'
DATE	APRIL 22, 2025
SHEET	

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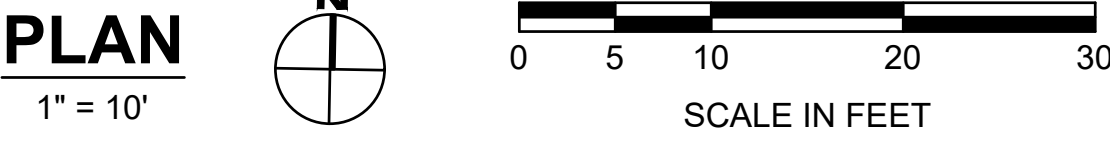


DEMOLITION NOTES

1. MAINTAIN PROJECT PERIMETER FENCE FOR THE DURATION OF THE CONSTRUCTION PERIOD. CONTRACTOR MAY UTILIZE SECTIONS OF (E) SITE FENCING TO MEET THE REQUIREMENTS FOR PROJECT PERIMETER FENCE IF PERMISSION IS OBTAINED FROM LAND OWNERS, AGENCIES, AND O.R.
2. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND UTILITIES ON THE SITE AND NOTIFY O.R. OF ALL DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING MINOR SITE ADJUSTMENTS TO GRADING, ALIGNMENT, AND LAYOUT TO PROPOSED SITE IMPROVEMENTS.
3. PP ALL EXISTING SITE FEATURES UNLESS OTHERWISE NOTED.
4. PP ALL UTILITIES UNLESS OTHERWISE NOTED.
5. LEFT BANK AND RIGHT BANK DESIGNATIONS ARE VIEWED LOOKING DOWNSTREAM, UNLESS OTHERWISE NOTED.
6. INSTALL SILT FENCING ALONG PINOLE CREEK BETWEEN THE COFFERDAMS AND LIMIT OF GRADING, UP AND DOWNSTREAM.
7. PRESERVE AND PROTECT TREES TO REMAIN BY LIMITING GROUND DISTURBANCE TO ONLY WHAT IS NECESSARY TO COMPLETE THE WORK SHOWN ON PLANS. ENSURE EQUIPMENT OPERATOR IS ASSISSTED WITH ADDITIONAL PERSONNEL TO DIRECT EQUIPMENT ACTIVITY IN A MANNER THAT PROTECTS TREES TO REMAIN.
8. STAGE EQUIPMENT AND MATERIALS WITHIN LIMIT OF WORK ONLY.
9. SEE BIOLOGICAL ASSESSMENT (DATED MARCH 2025) AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND GUIDELINES RELATED TO DEWATERING, EROSION CONTROLS, AND ENVIRONMENTAL CONTROLS.
10. LEGALLY DISPOSE OF ALL MATERIAL CLEARED, GRUBBED, AND DEMOLISHED NOT UTILIZED FOR PROJECT OR ACCEPTED BY OWNER.

DEMOLITION LEGEND

- LIMIT OF WORK (L.O.W.), SHOWN SCHEMATICALLY
- (E) MAJOR CONTOUR (5-FT)
- (E) MINOR CONTOUR (1-FT)
- TOP
- x- TOP OF BANK
- x- SILT FENCE
- ORDINARY HIGH WATER (OHW)
- REMOVE FENCING AND GATES
- [Cross-hatched box] REMOVE RIPRAP AND CONCRETE. SEE DEMOLITION NOTES AND NOTES ON PLAN.
- [Diagonal hatched box] REMOVE AC PAVEMENT
- [Horizontal hatched box] STRIP TOP 2" OF SOIL, SEE SPECS
- [Thick arrow] CONSTRUCTION ACCESS
- [Circle with dot] TREE TO REMAIN, PRESERVE AND PROTECT
- [X] TREE TO BE REMOVED
- [Curved line] COFFERDAM, SHOWN SCHEMATICALLY
- [Square with rectangle] NOISE ATTENUATED PUMP
- [Thin arrow] DEWATERING LINE, SHOWN SCHEMATICALLY



REVISIONS		DESCRIPTION	DATE	NO.
APPR				

TOMATO STAND FISH PASSAGE

90% DESIGN (NOT FOR CONSTRUCTION)

DEMOLITION

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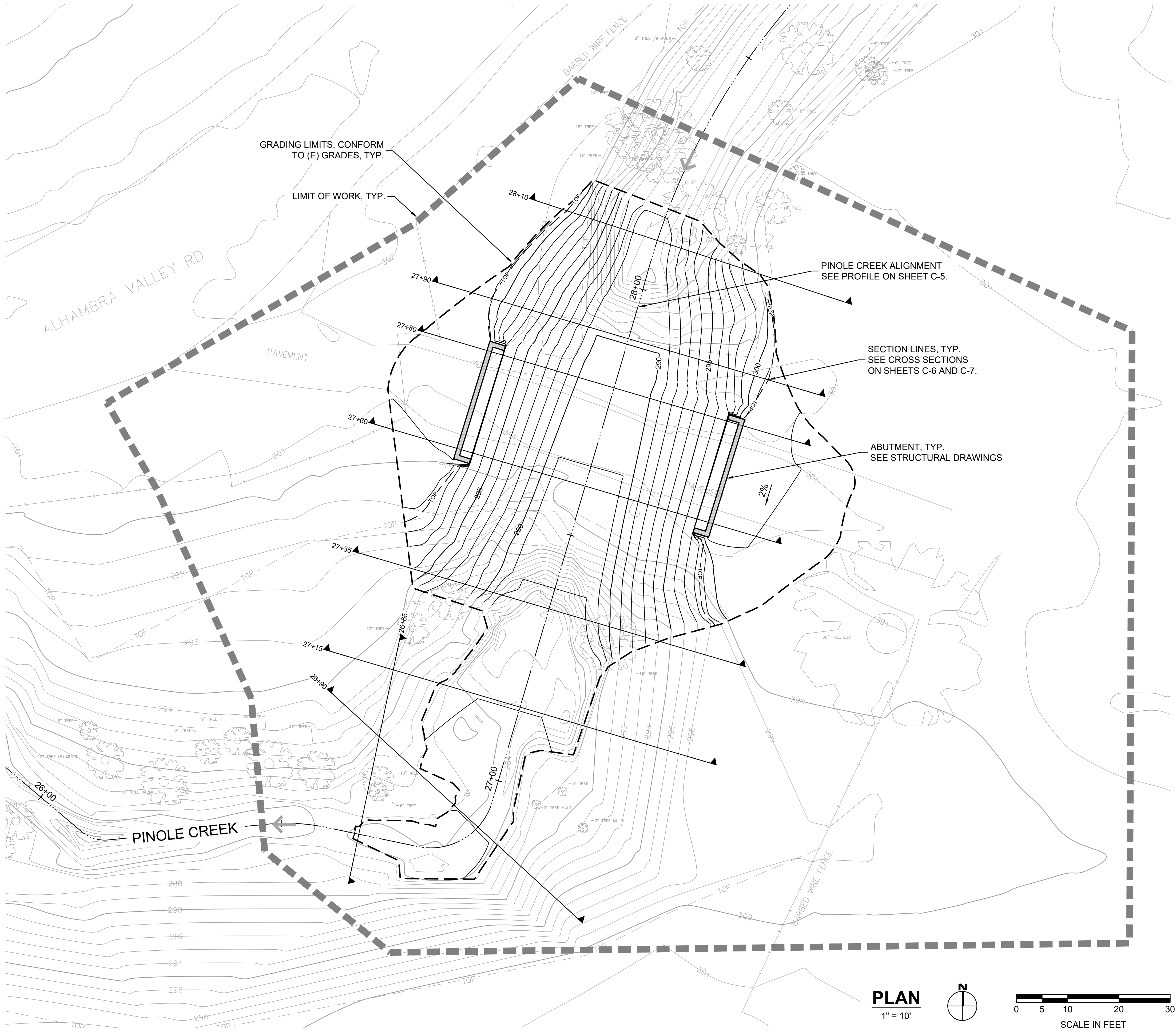
CIVIL
STATE OF CALIFORNIA
C 79249
MATTHEW J. TROMPETER

DESIGN BY	MT, ES
DRAWN BY	JH, HH
CHECKED BY	MT, ES
SCALE	1" = 10'
DATE	APRIL 22, 2025
SHEET	

C-1

OF 17

C:\USERS\HANSEN\RESTORATION DESIGN GROUP\PROJECTS - DOCUMENTS\TOMATO STAND FISH PASSAGE\04 AUTOCAD\WORKING DRAWINGS\SHEETS\TOM-C-GRAD.DWG PLOTTED ON: 4/22/2025



GRADING NOTES

1. CHANNEL GRADING AND ROCK WORK SHALL BE STAKED IN THE FIELD FOR REVIEW AND APPROVAL BY O.R. PRIOR TO INSTALLATION.
2. SEE CROSS SECTIONS FOR ADDITIONAL GRADING INFORMATION.
3. MAXIMUM ALLOWABLE SLOPE IS 2:1.
4. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL BMP'S DEFINED IN THE WPCP.
5. PRESERVE AND PROTECT ALL EXISTING UTILITIES UNLESS OTHERWISE NOTED.
6. WHERE EXCAVATION IS REQUIRED ADJACENT TO (E) UTILITIES, HAND EXCAVATE TO VERIFY CONDITION AND LOCATION.
7. FINISHED GRADED SURFACE MUST BE SMOOTH EVEN SLOPES WITH GRADUAL TRANSITIONS TO MATCH EXISTING GRADES. NO ABRUPT CHANGES IN GRADES ARE ALLOWED UNLESS OTHERWISE NOTED.

GRADING LEGEND

- LIMIT OF WORK (L.O.W.)
- (E) MAJOR CONTOUR (5-FT)
- (E) MINOR CONTOUR (1-FT)
- MAJOR CONTOUR (5-FT)
- MINOR CONTOUR (1-FT)
- TOP --- (E) TOP OF BANK
- TOP --- PROPOSED TOP OF BANK
- GRADE BREAK
- LIMIT OF GRADING

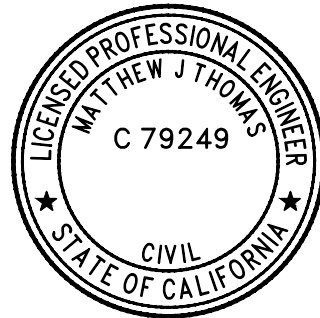
TOMATO STAND FISH PASSAGE

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GRADING



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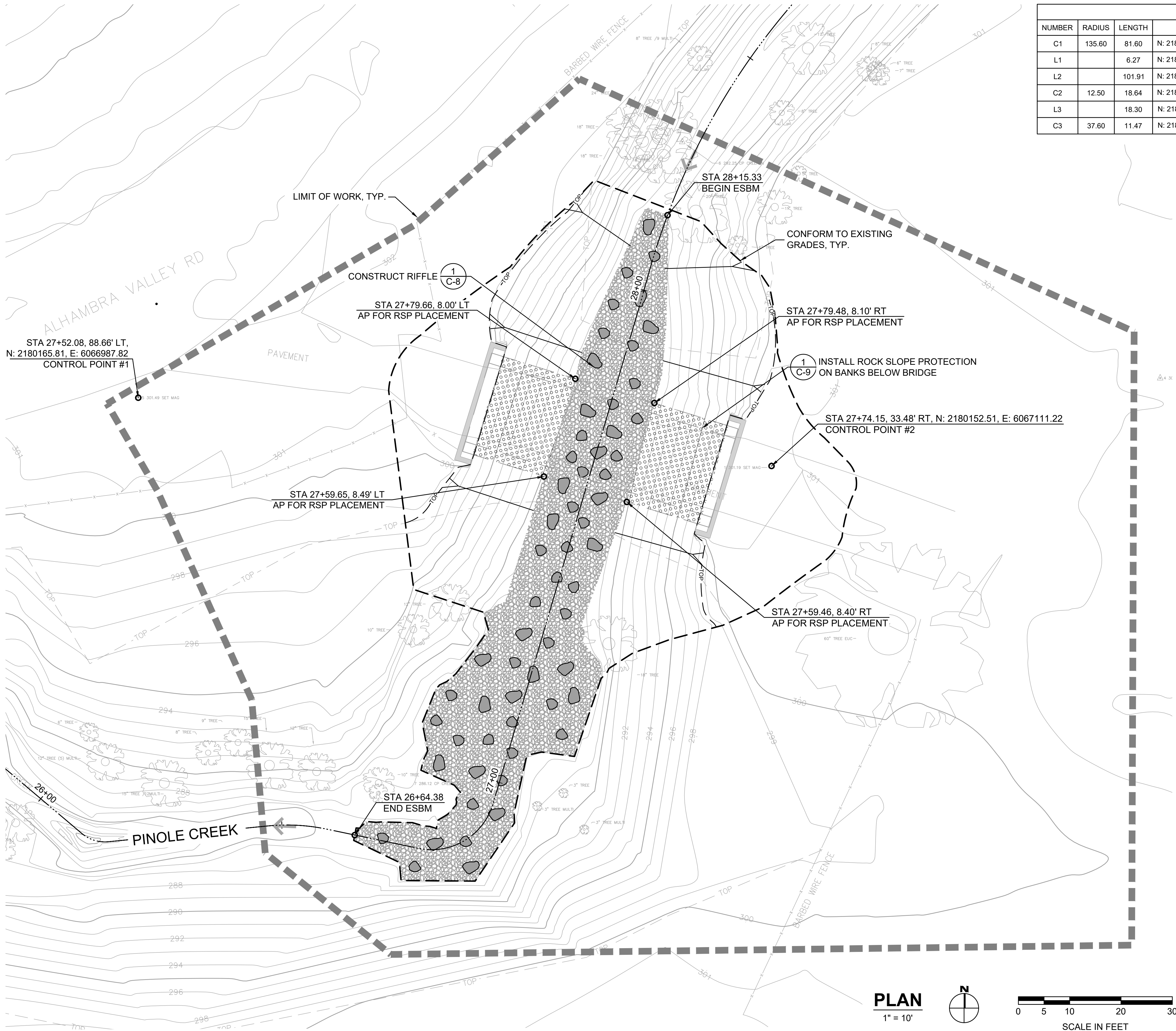


DESIGN BY MT, ES
DRAWN BY JH, HH
CHECKED BY MT, ES
SCALE 1" = 10'
DATE APRIL 22, 2025
SHEET

C-2

OF 17

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PINOLE CREEK ALIGNMENT TABLE						
NUMBER	RADIUS	LENGTH	START POINT	START STA	END POINT	END STA
C1	135.60	81.60	N: 2180190.5009, E: 6067087.4118	28+03.88	N: 2180258.0198, E: 6067131.0086	28+85.47
L1		6.27	N: 2180184.4578, E: 6067085.7232	27+97.60	N: 2180190.5009, E: 6067087.4118	28+03.88
L2		101.91	N: 2180086.6954, E: 6067056.9568	26+95.69	N: 2180184.4578, E: 6067085.7232	27+97.60
C2	12.50	18.64	N: 2180077.9894, E: 6067042.4027	26+77.06	N: 2180086.6954, E: 6067056.9568	26+95.69
L3		18.30	N: 2180081.7398, E: 6067024.4961	26+58.76	N: 2180077.9894, E: 6067042.4027	26+77.06
C3	37.60	11.47	N: 2180082.3552, E: 6067013.0821	26+47.29	N: 2180081.7398, E: 6067024.4961	26+58.76

LAYOUT NOTES

- SITE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO: FENCES, SWALES, AND GRADE CONTROL CUT SLOPES AND STRUCTURES SHALL BE STAKED IN THE FIELD FOR REVIEW AND APPROVAL BY O.R. PRIOR TO INSTALLATION.
- SEE SECTIONS FOR ADDITIONAL GRADING INFORMATION.
- MAXIMUM ALLOWABLE SLOPE IS 2:1.
- CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL BMP'S DEFINED IN THE BIOLOGICAL ASSESSMENT DATED MARCH 2025.
- WHERE EXCAVATION IS REQUIRED ADJACENT TO (E) UTILITIES, HAND EXCAVATE TO VERIFY CONDITION AND LOCATION.
- FLOODPLAIN GRADING IS INTENDED TO BE IMPLEMENTED WITH SMOOTH, EVEN SLOPES AND CONTOURS. NO ABRUPT CHANGES SHALL BE ALLOWED.

LAYOUT LEGEND

- LIMIT OF WORK (L.O.W.)
- (E) MAJOR CONTOUR (5-FT)
- (E) MINOR CONTOUR (1-FT)
- MAJOR CONTOUR (5-FT)
- MINOR CONTOUR (1-FT)
- TOP --- (E) TOP OF BANK
- TOP --- PROPOSED TOP OF BANK
- LIMIT OF GRADING
- CUT SLOPE
- [Pattern] ENGINEERED STREAMBED MATERIAL
- [Pattern] ROCK SLOPE PROTECTION
- [Symbol] BOULDERS



REVISIONS

NO.	DATE	DESCRIPTION	APPR.

TOMATO STAND FISH PASSAGE

90% DESIGN (NOT FOR CONSTRUCTION)

CHANNEL LAYOUT



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DESIGN BY	MT, ES
DRAWN BY	JH, HH
CHECKED BY	MT, ES
SCALE	1" = 20'
DATE	APRIL 22, 2025
SHEET	

C-3

OF 17

1. SITE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO: FENCES, SWALES, AND GRADE CONTROL CUT SLOPES AND STRUCTURES SHALL BE STAKED IN THE FIELD FOR REVIEW AND APPROVAL BY O.R. PRIOR TO INSTALLATION.
2. SEE SECTIONS FOR ADDITIONAL GRADING INFORMATION.
3. MAXIMUM ALLOWABLE SLOPE IS 2:1.
4. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL BMP'S DEFINED IN THE BIOLOGICAL ASSESSMENT DATED MARCH 2025.
5. WHERE EXCAVATION IS REQUIRED ADJACENT TO (E) UTILITIES, HAND EXCAVATE TO VERIFY CONDITION AND LOCATION.
6. FLOODPLAIN GRADING IS INTENDED TO BE IMPLEMENTED WITH SMOOTH, EVEN SLOPES AND CONTOURS. NO ABRUPT CHANGES SHALL BE ALLOWED

	LIMIT OF WORK (L.O.W.)
	(E) MAJOR CONTOUR (5-FT)
	(E) MINOR CONTOUR (1-FT)
	MAJOR CONTOUR (5-FT)
	MINOR CONTOUR (1-FT)
	(E) TOP OF BANK
	PROPOSED TOP OF BANK
	CUT SLOPE
	CLASS II AB SURFACE

REVISIONS			
NO.	DATE	DESCRIPTION	APPR

TOMATO STAND FISH PASSAGE

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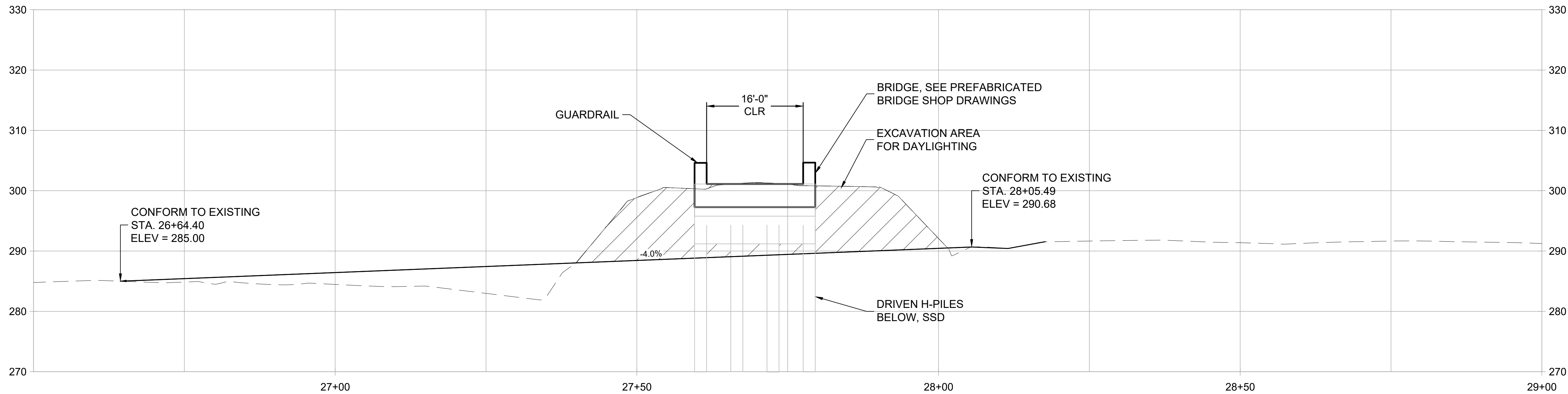
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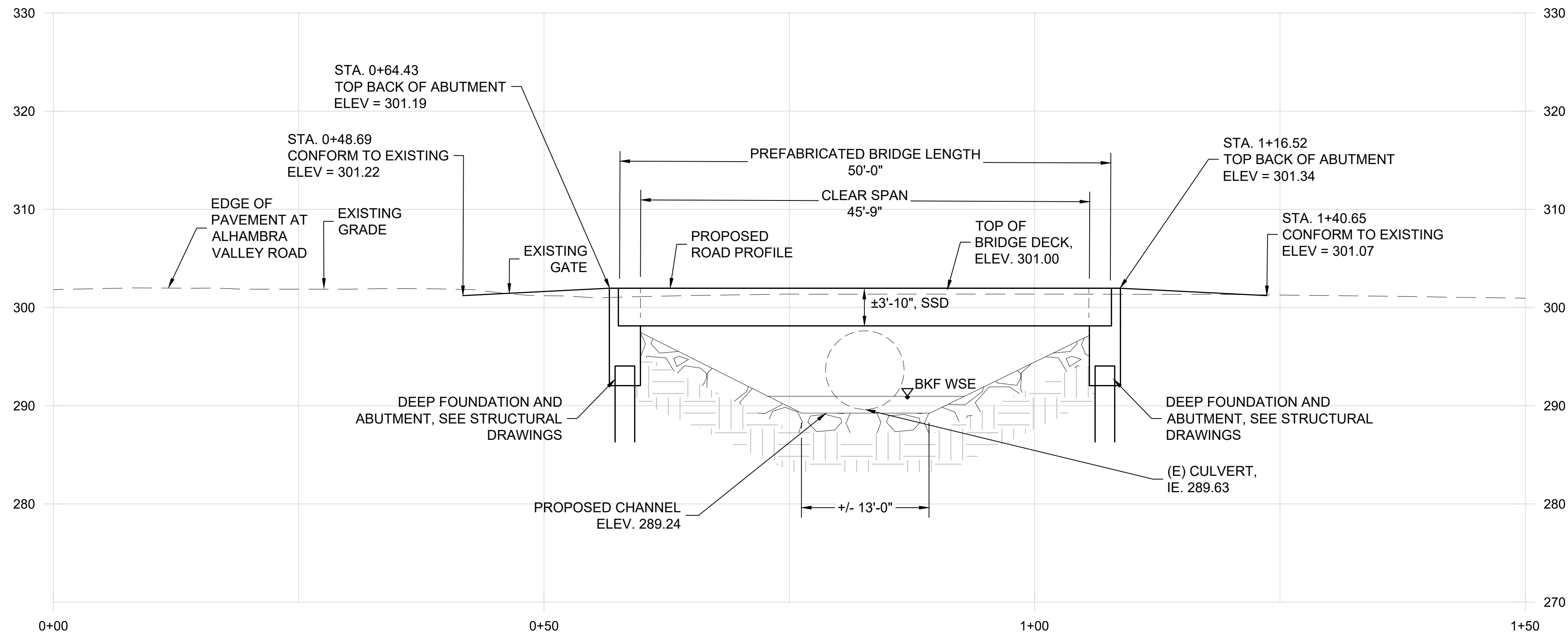
DESIGN BY	MT, ES
DRAWN BY	JH, HH
CHECKED BY	MT, ES
SCALE	1" = 20'
DATE	APRIL 22, 2025
SHEET	

C-4

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PROFILE OF PINOLE CREEK AT NEW CROSSING
1" = 10' HORIZ.
1" = 10' VERT



PROPOSED ROAD PROFILE AT PINOLE CREEK
1/8" = 1'-0"

REVISIONS		DATE	DESCRIPTION	APPR
NO				

TOMATO STAND FISH PASSAGE

PROFILES

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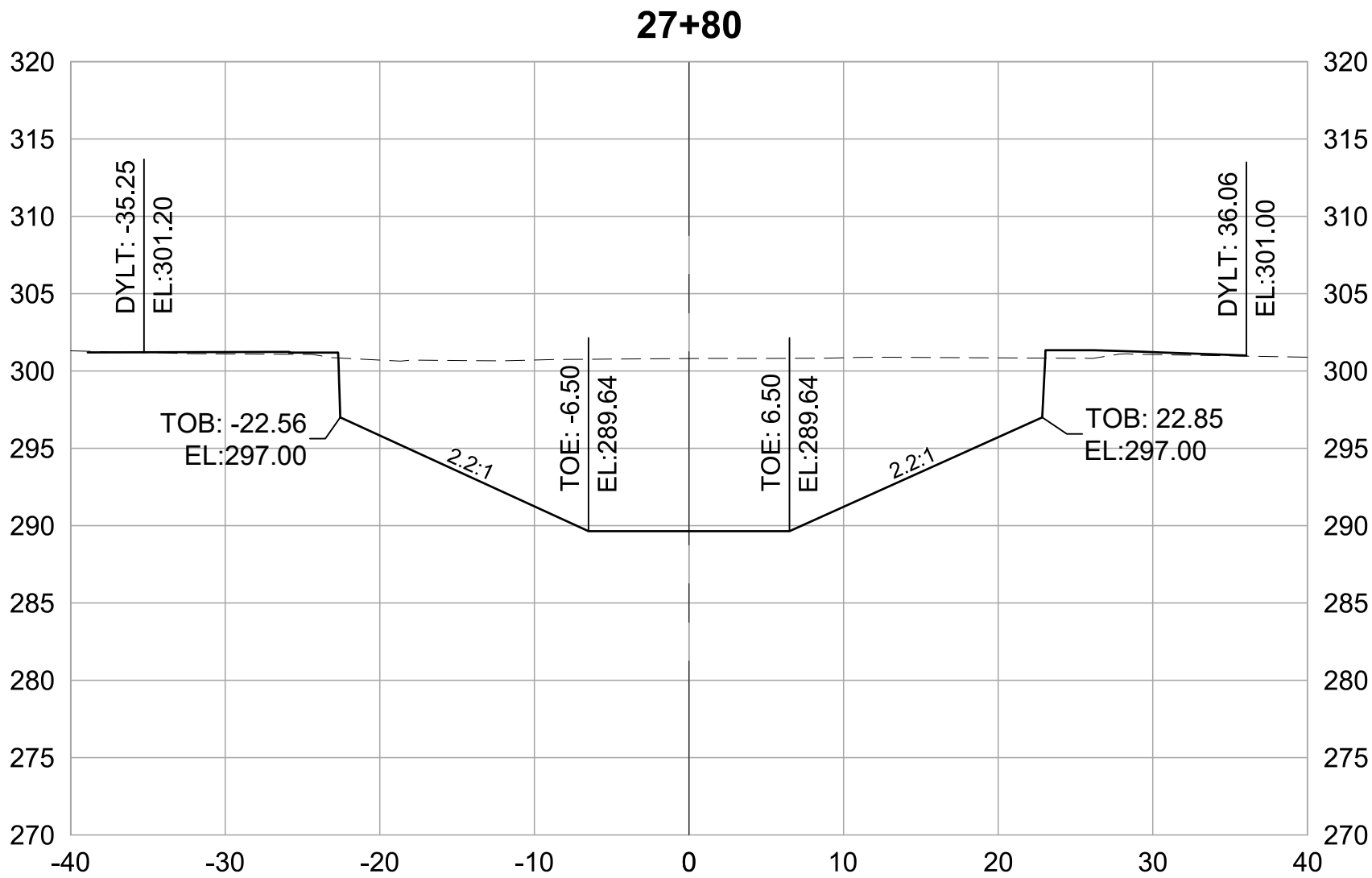
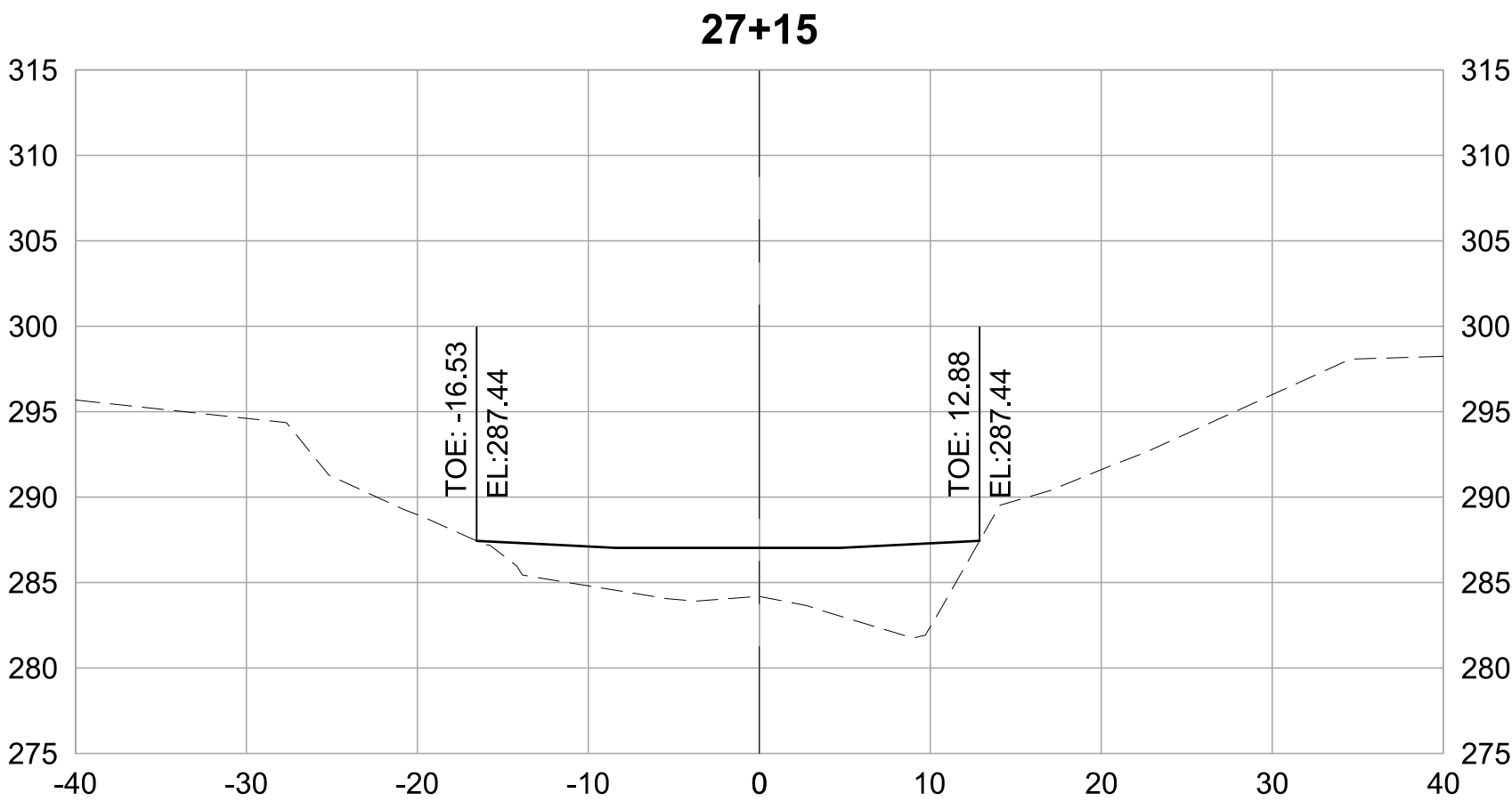
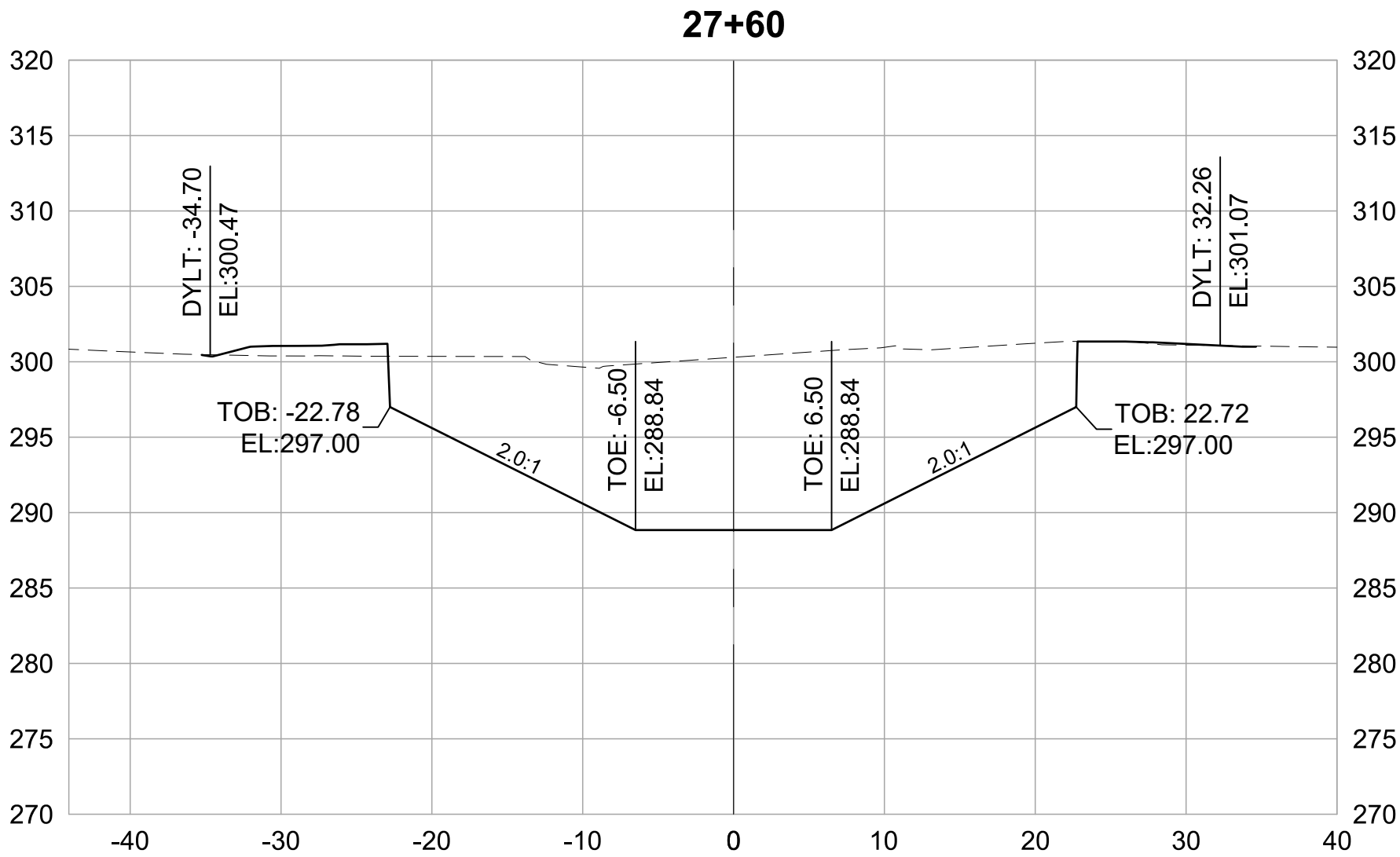
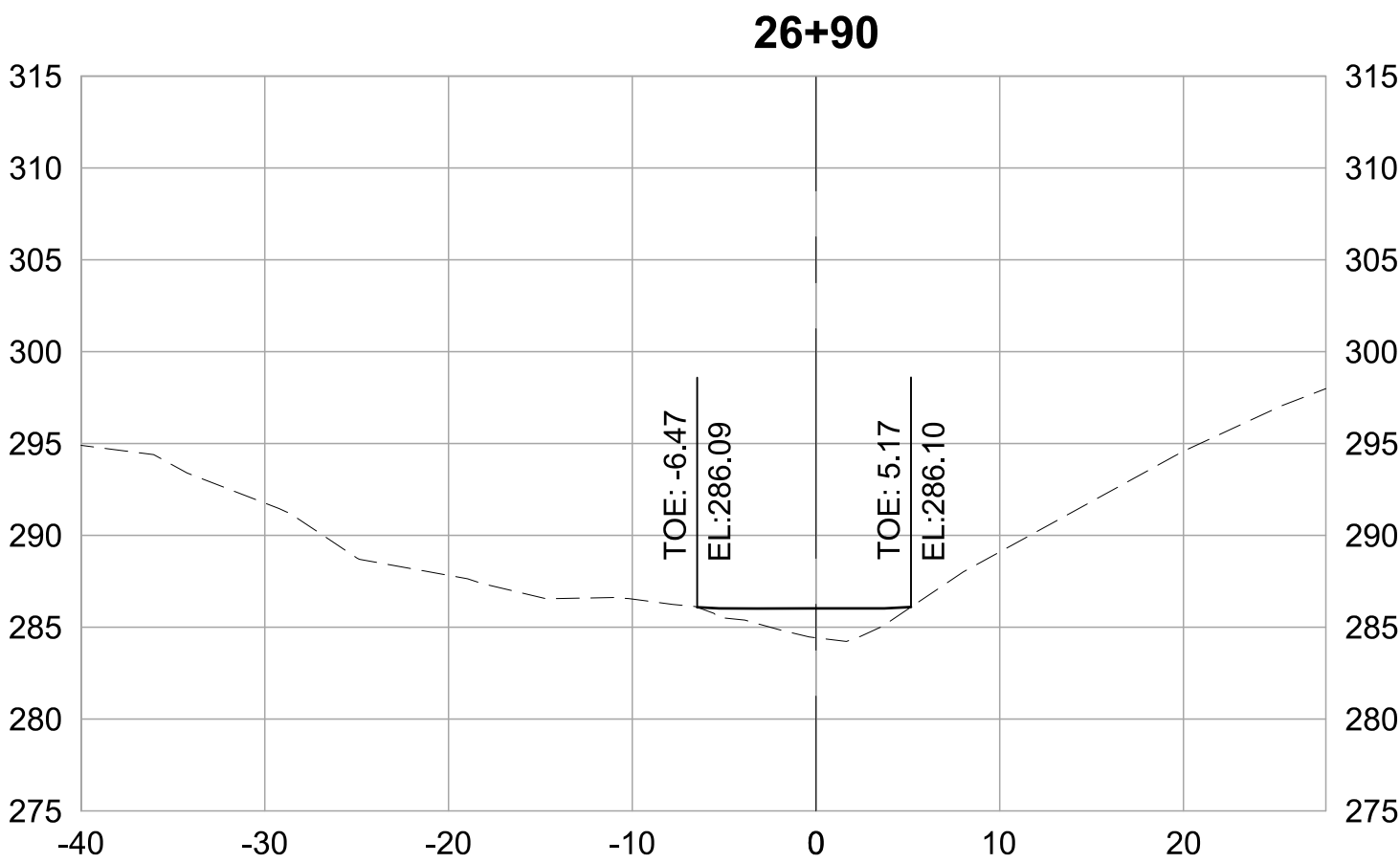
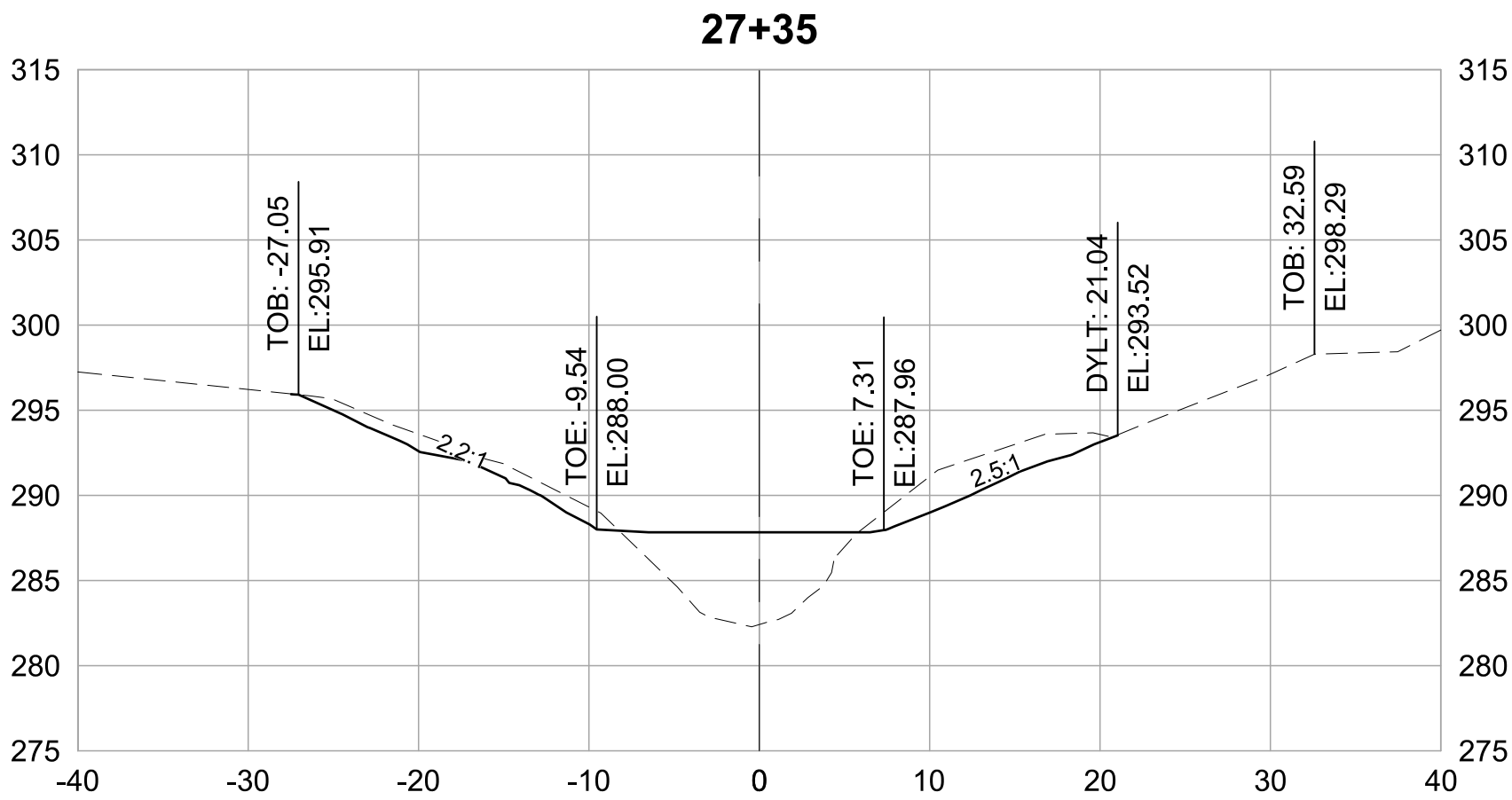
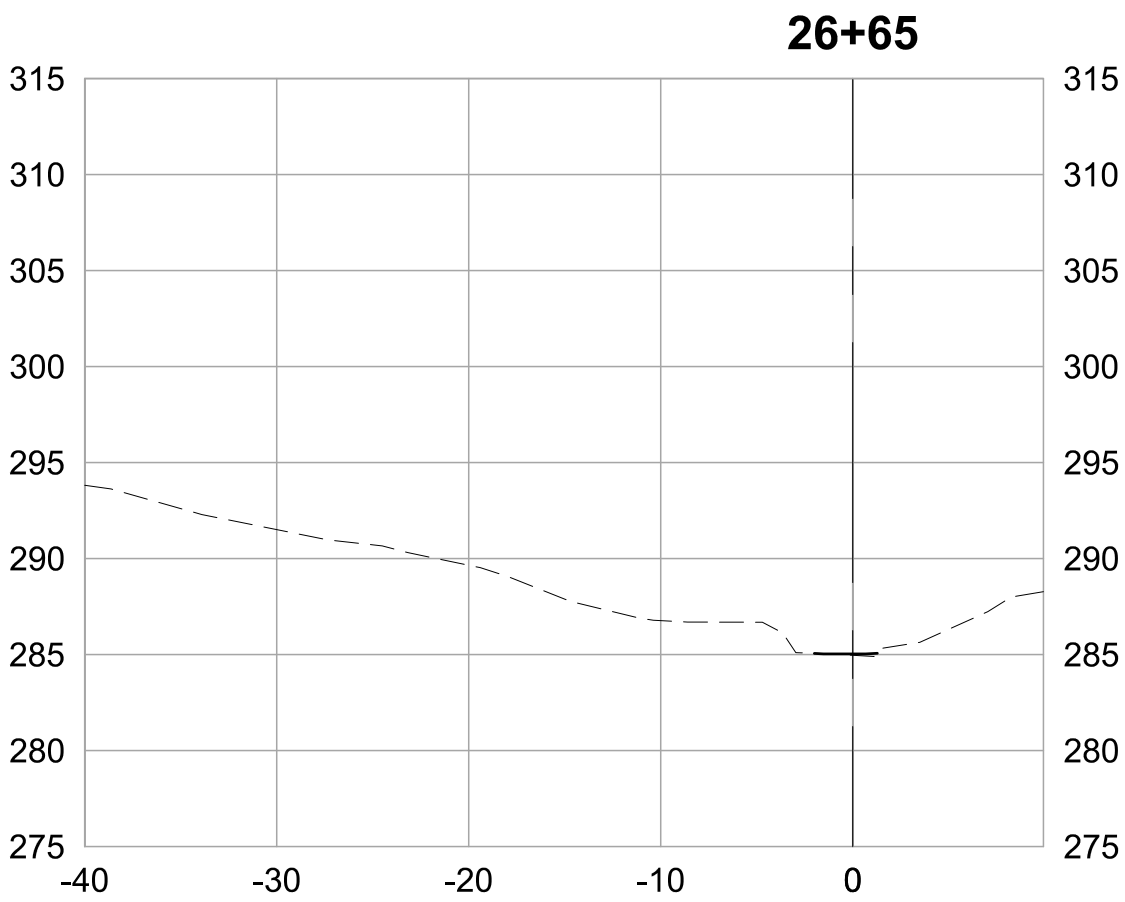


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CHECKED BY	MT, ES
SCALE	AS NOTED
DATE	APRIL 22, 2025
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OF 17

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PINOLE CREEK LOOKING DOWNSTREAM

1" = 10' HORIZ.
1" = 10' VERT

REVISIONS		NO	DATE	DESCRIPTION	APPR

TOMATO STAND FISH PASSAGE		SECTIONS
90% DESIGN (NOT FOR CONSTRUCTION)		

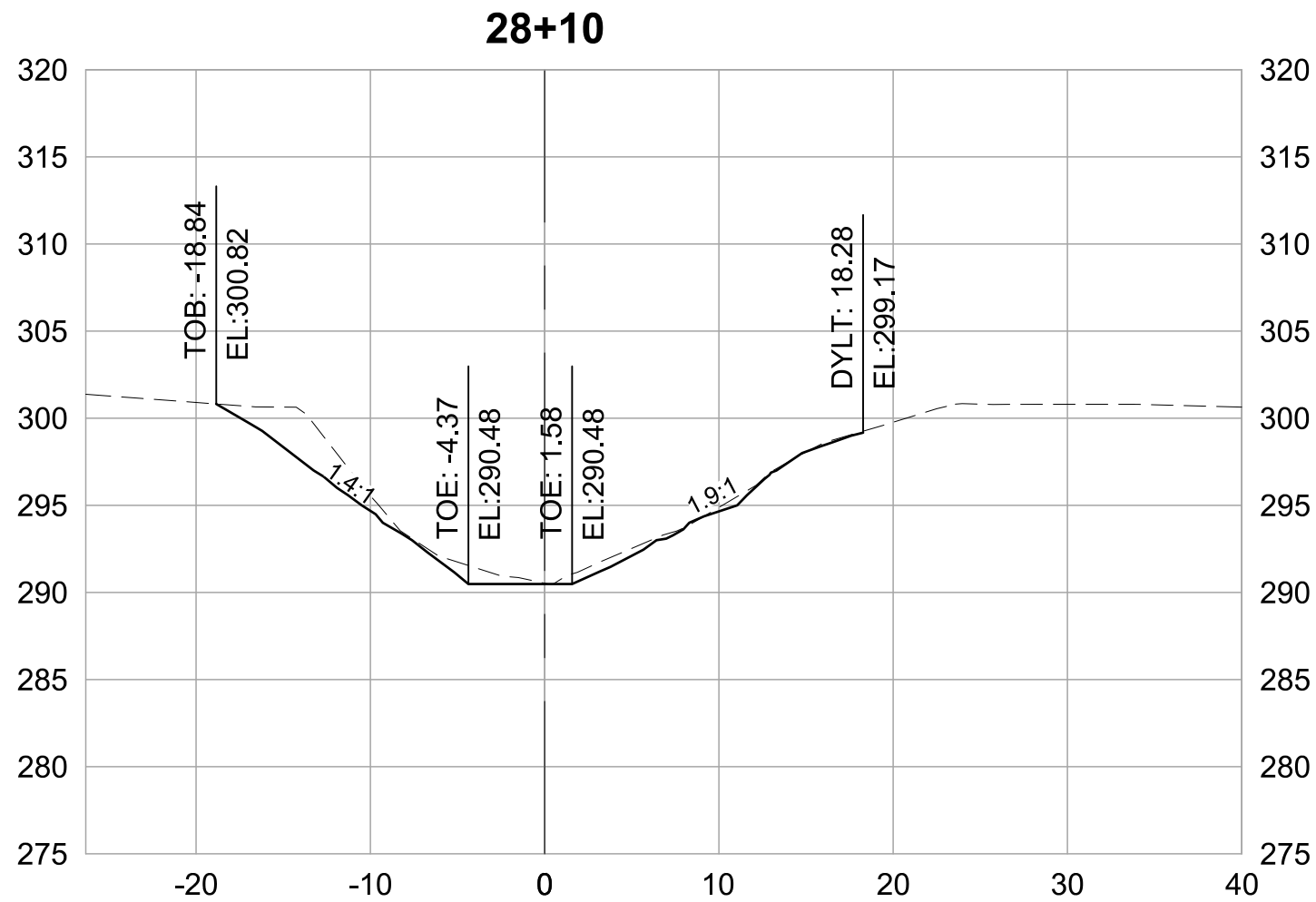
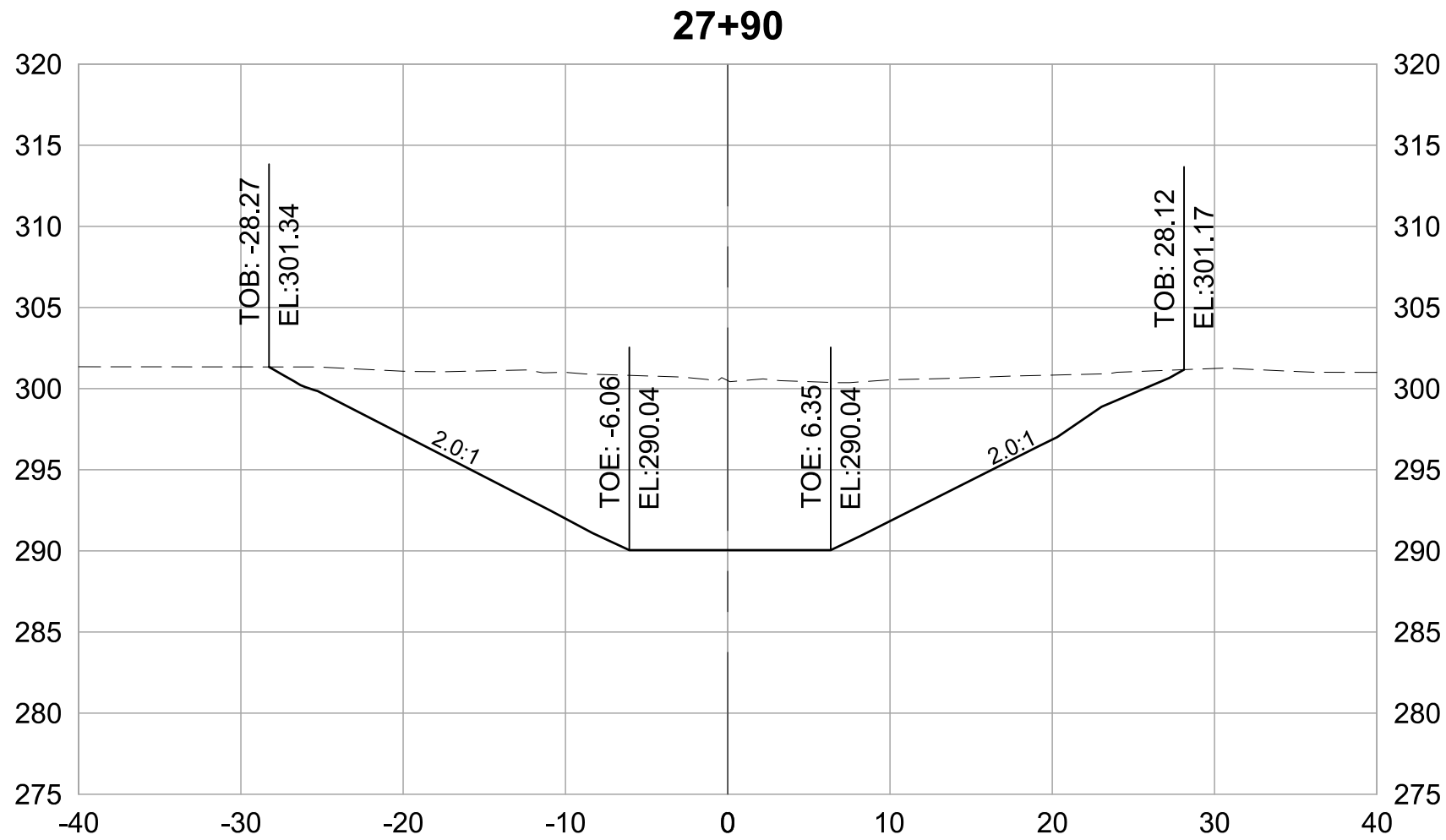


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REVISIONS			APPR
NO	DATE	DESCRIPTION	

TOMATO STAND FISH PASSAGE

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SECTIONS

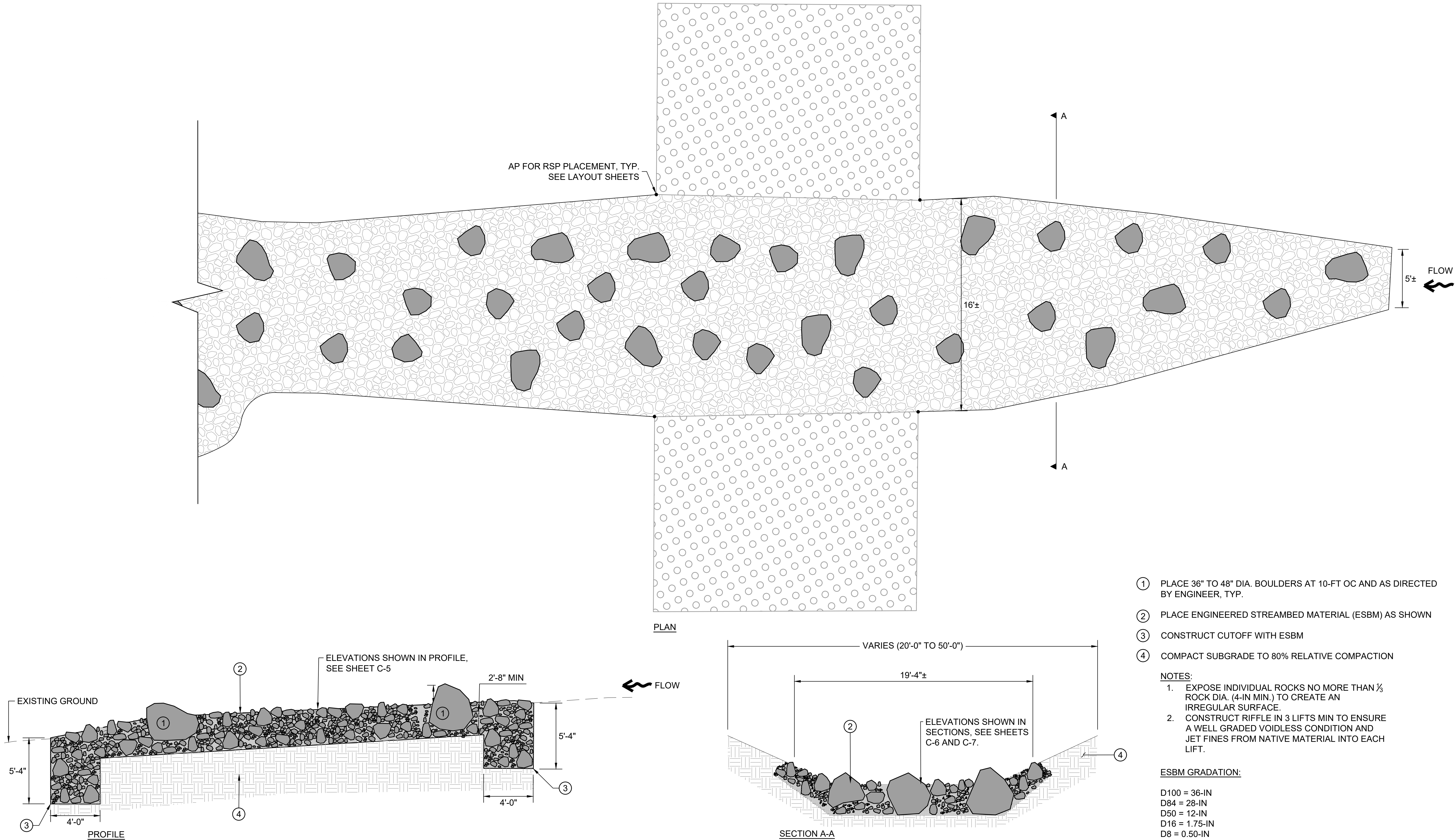


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CONSTRUCTED RIFFLE

SCALE: NTS

1

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CIVIL DETAILS

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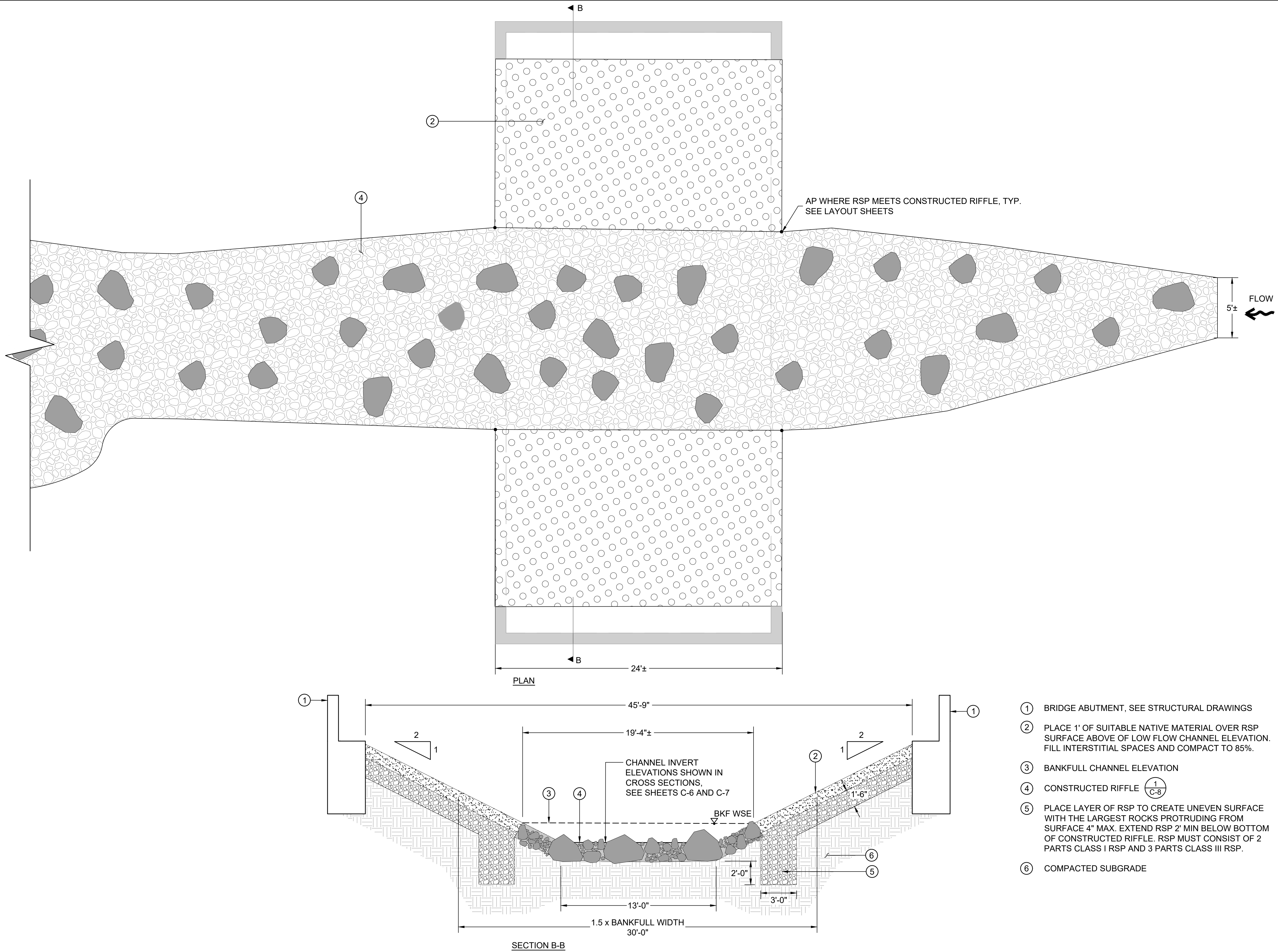


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ROCK SLOPE PROTECTION

SCALE: 1/4" = 1'-0"

1

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REVEGETATION NOTES

- 1. FINAL LAYOUT OF TREES TO BE APPROVED BY O.R. IN THE FIELD. CONTRACTOR TO PROVIDE MEANS OF MARKING PLANT LOCATIONS.
- 2. WILLOW SPECIES TO BE INTERMIXED WITHIN EACH HATCHED PLANTING AREA, AS DIRECTED BY O.R.
- 3. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

REVEGETATION LEGEND

- LIMIT OF WORK (L.O.W.)
- MAJOR CONTOUR
- - - MINOR CONTOUR
- FR FIBER ROLL

TREES / SHRUBS		QUANTITY	SIZE
	LIVE OAK - QUERCUS AGRIFOLIA	2	5 GA
	VALLEY OAK - QUERCUS LOBATA	2	5 GA
	CALIFORNIA WALNUT - JUGLANS CALIFORNICA	2	D-POT
	CALIFORNIA BUCKEYE - AESCULUS CALIFORNICA	7	D-POT

LIVE CUTTINGS		QUANTITY
	WILLOW AND DOGWOOD CUTTINGS PLANTED IN ROCK MIN. 36" O.C.	310

SEEDING		QUANTITY
	SEEDING (DISTURBED AREAS) SEE SPECIFICATIONS FOR SPECIES MIX	6080 SF

PLAN
1" = 10'



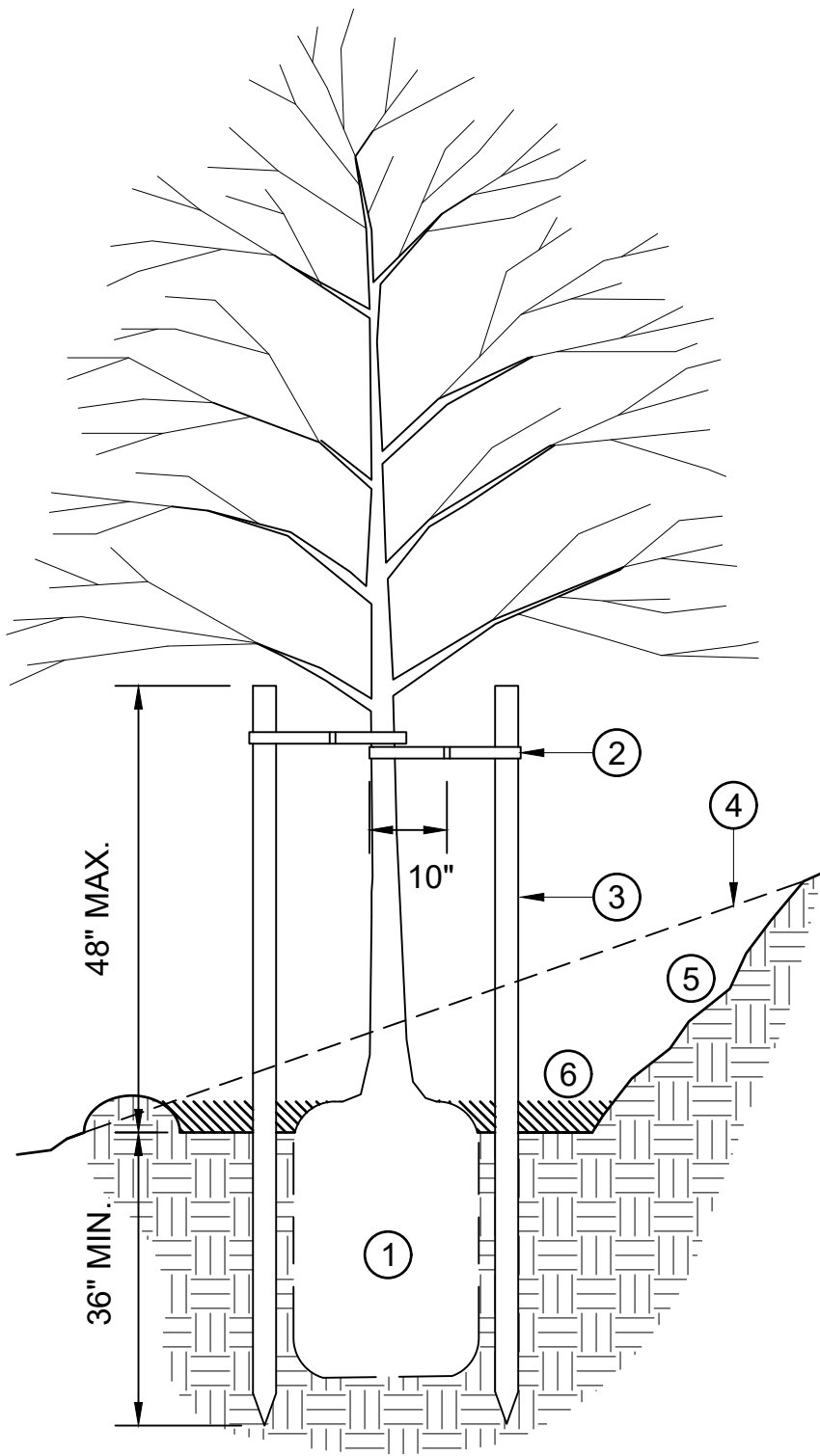
TOMATO STAND FISH PASSAGE
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REVEGETATION

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SCALE	1" = 10'
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L-1

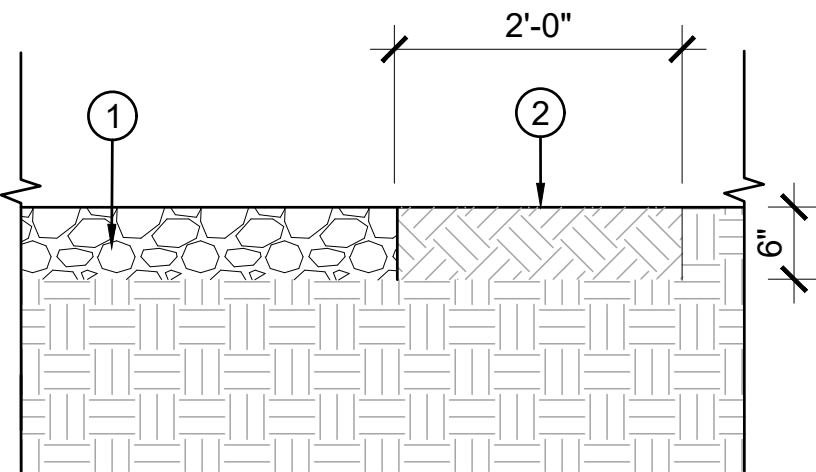
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- 1 LARGE CONTAINER TREE (5 GALLON OR LARGER)
- 2 PROVIDE (2) ARBORTIE TREE TIES W/ 10" WIDE LOOPS AROUND TRUNK. SECURE ARBORTIES 4" MIN FROM TOP OF STAKES. DIRECTION AND APPROVAL OF INSTALLATION BY O.R.
- 3 TREE STAKES, SET VERTICAL OUTSIDE ROOTBALL. KEEP TOP OF STAKES 6" MIN CLEAR OF LIMBS. SET IN LINE WITH CREEK FLOW DIRECTION.
- 4 ORIGINAL GRADE - SLOPED CONDITION
- 5 FINISH GRADE - SLOPED CONDITION
- 6 MULCH

TREE STAKING

SCALE: 3/4" = 1'-0"



- 1 PLACE 6" OF 1-1/2" CLASS II AB AND COMPACT TO 95% RELATIVE COMPACTION
- 2 CONSTRUCT SHOULDER FROM SUITABLE NATIVE MATERIAL AND COMPACT TO 90% RELATIVE COMPACTION

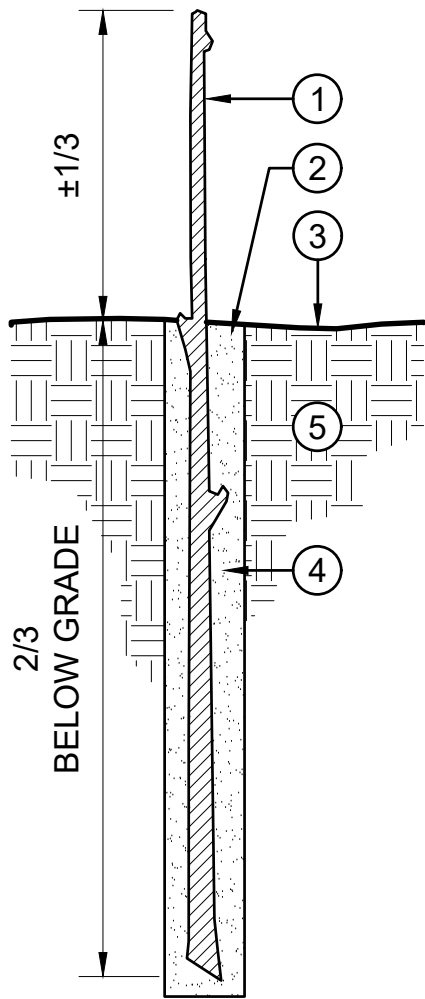
CLASS II AB PAVING

SCALE: 3/4" = 1'-0"

- 1 LIVE CUTTING
- 2 PILOT HOLE
- 3 FINISH GRADE, FABRIC OR SEEDING
- 4 NATIVE SOIL, VOID OF AIR POCKETS, SEE SPECIFICATIONS
- 5 SUBGRADE

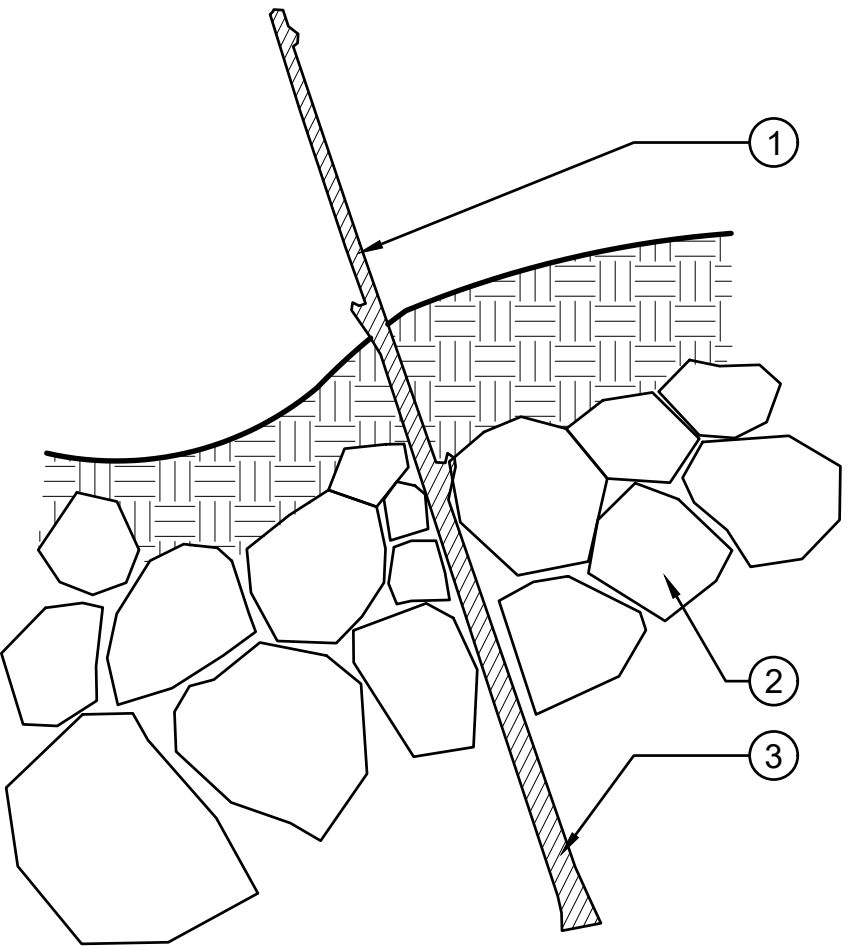
NOTE:
SET ALL CUTTINGS PERPENDICULAR TO FINISH GRADE. INSTALL WITH IRREGULAR SPACING (TO MIMIC NATURALISTIC OCCURRENCE).

WILLOW POLES: 5-FT LONG, 1.5" Ø MAX
DOGWOOD STAKES: 2-FT LONG, 0.5" MAX



LIVE CUTTING

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



LIVE CUTTING IN RIPRAP

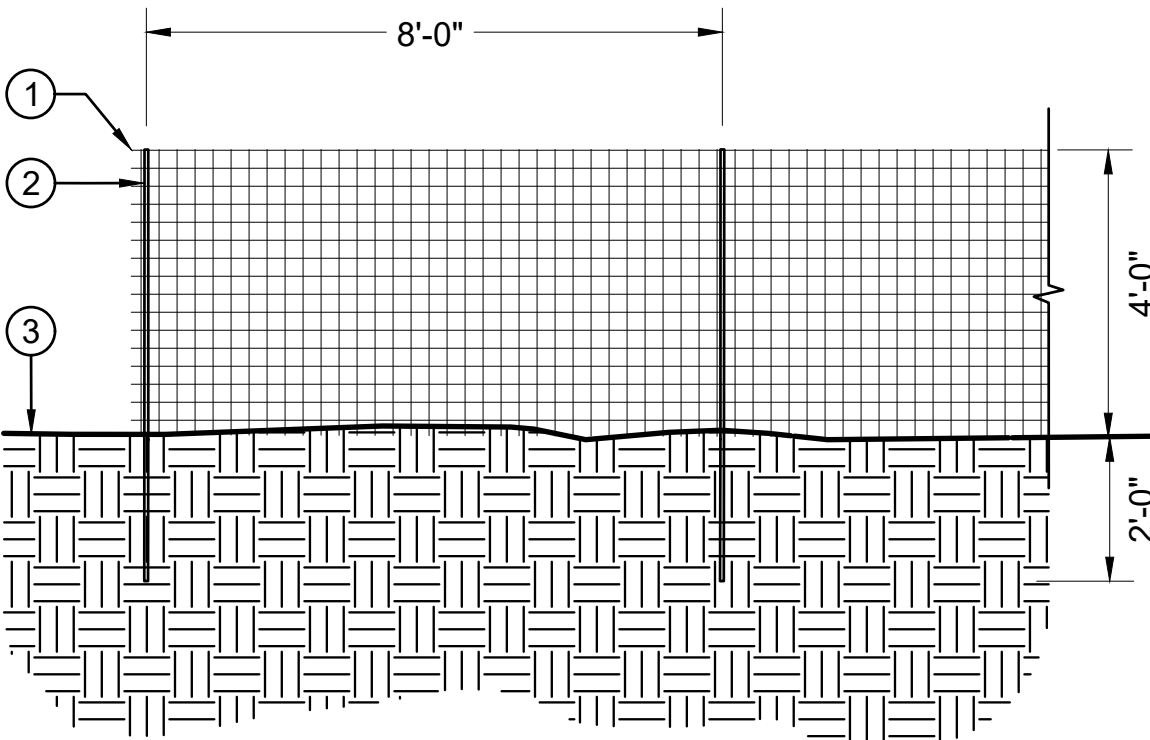
SCALE: 1-1/2" = 1'-0"

- 1 HEAVY DUTY PLASTIC SNOW FENCE
- 2 6 FOOT METAL U-CHANNEL POST, FENCING CONNECTED TO POSTS WITH ZIP TIES
- 3 EXISTING GRADE

NOTES:

TREE PROTECTION FENCING TO BE INSTALLED AT THE PERIMETER OF EXISTING TREE'S DRIPLINE, TYP.

GROUPS OR CLUSTERS OF TREES MAY BE PROTECTED WITHIN ONE FENCE PERIMETER AS APPROPRIATE



TREE PROTECTION FENCE

SCALE: 3/8" = 1'-0"

TOMATO STAND FISH PASSAGE

90% DESIGN (NOT FOR CONSTRUCTION)

LANDSCAPE DETAILS



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GENERAL STRUCTURAL NOTES:
THE FOLLOWING NOTES ARE GENERAL AND APPLY TO THE ENTIRE PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE (UNO)

- 1) DESIGN CRITERIA:
- A. CODE:
1. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION, 2020
- 2) CONCRETE:
- A. ALL CONCRETE WORK SHALL CONFORM TO THE LATEST EDITION OF ACI 301 AND ACI 117, EXCEPT AS MODIFIED BY THE FOLLOWING SUPPLEMENTAL REQUIREMENTS.
- B. ALL FOUNDATION CONCRETE SHALL BE NORMAL WEIGHT CONCRETE.
- C. CONCRETE MIX DESIGN SHALL BE ESTABLISHED IN ACCORDANCE WITH CHAPTER 26 OF ACI 318.
- D. APPROVED ADMIXTURES:
1. FLYASH PER ASTM C-618
2. AIR ENTRAINING PER ASTM C-260
3. WATER REDUCING PER ASTM C-494
- E. COMPRESSIVE STRENGTH (28 DAYS)
MINIMUM f'_c = 4000 PSI
- F. REINFORCEMENT FOR CONCRETE:
1. ALL REINFORCING SHALL BE SUPPORTED IN FORMS SPACED WITH NECESSARY ACCESSORIES AND SHALL BE SECURELY WIRED TOGETHER IN ACCORDANCE WITH THE LATEST EDITION OF THE CRSI "MANUAL OF STANDARD PRACTICE"
a) DEFORMED BARS – ASTM A615, GRADE 60
b) WELDED WIRE REINFORCEMENT (WWR):
– SMOOTH WIRE – ASTM A185
– DEFORMED WIRE – ASTM A497
– USE FLAT MATS ONLY. NO ROLLED WWR IS PERMITTED.
- F. MINIMUM WWR LAP = GRID SPACING PLUS 2 INCHES, UNO
- G. MINIMUM CONCRETE COVER OVER REINFORCEMENT:
1. CAST-IN-PLACE CONCRETE
a) CONCRETE CAST AGAINST EARTH = 3"
b) ALL OTHER CONCRETE = 2"
- H. FORMWORK: DESIGN, ERECT, SUPPORT, BRACE AND MAINTAIN FORMWORK TO SUPPORT VERTICAL, LATERAL, STATIC AND DYNAMIC LOADS THAT MIGHT BE APPLIED UNTIL STRUCTURE CAN SUPPORT SUCH LOADS.

- 3) GEOTECHNICAL:
- A. STRUCTURAL BACKFILL SHALL CONFORM TO CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STANDARD SPECIFICATIONS, SECTION 19-3.02C, IN 2023 EDITION.
- B. OVER EXCAVATE TO A MINIMUM OF 4- FEET BELOW BOTTOM OF THE BRIDGE ABUTMENTS AND REPLACE WITH STRUCTURAL FILL.
- C. PRE-DRILL 16" DIAMETER 4- FEET DEEP HOLES PRIOR TO DRIVING PILES.

BRIDGE REACTIONS – TO BE PROVIDED BY BRIDGE FABRICATOR						
	EXTERIOR GIRDERS			INTERIOR GIRDERS		
BRIDGE REACTIONS	P (KIPS)	T (KIPS)	L (KIPS)	P (KIPS)	T (KIPS)	L (KIPS)
DEAD LOAD (DC)	XXXX			XXXX		
WEARING SURFACE (DW)	XXXX			XXXX		
LIVE LOAD (LL)	XXXX			XXXX		
LANE LOAD (LL)	XXXX			XXXX		
BRAKING FORCE (BR)			XXXX			XXXX
WINDLOAD (WS)	XXXX	XXXX		XXXX	XXXX	
THERMAL (TU)			XXXX			XXXX
EARTHQUAKE (EQ)		XXXX	XXXX		XXXX	XXXX

"P" – VERTICAL LOAD AT EACH GIRDER
"T" – TRANSVERSE LOAD AT EACH GIRDER
"L" – LONGITUDINAL LOAD AT EACH GIRDER
* – DOES NOT INCLUDE IM.

DESIGN LOADS	
PERANENT LOADS	
DC	UNIT WEIGHT OF REINFORCED CONCRETE 0.150 KCF
EV	UNIT WEIGHT OF SOIL 0.130 KCF
EH	ACTIVE PRESSURE 0.036 KCF
	AT REST PRESSURE 0.057 KCF
TRANSIENT LOADS	
LL	HL-93
IM	DYNAMIC ALLOWANCE APPLIED TO TRUCK & TANDEM
LS	LIVE LOAD SURCHARGE AT ABUTMENT 3.0 FT
	LIVE LOAD SURCHARGE AT WING WALL 2.0 FT
TU	UNIFORM TEMPERATURE RANGE 0°F TO 80°F
	BASE SETTING TEMPERATURE 60°F
EXTREME EVENT LOADS	
EQ	SITE CLASS D
	TIME-AVERAGE SHEAR WAVE VELOCITY, V_{s30} 850 FPS
	HORIZONTAL PEAK GROUND ACCELERATION, HPGA 0.74 G
	DESIGN ACCELERATION RESPONSE SPECTRUM, ARS 1.58 G
	DE-AGGREGATED MEAN EARTHQUAKE MOMENT MAGNITUDE, M_w 6.9
	SEISMIC PERFORMANCE ZONE 2

PILE DESIGN LOADS	
STRENGTH LIMIT STATE	
NOMINAL AXIAL RESISTANCE R_N	185.70 KIPS
AXIAL RESISTANCE FACTOR ϕ	0.70
FACTORED AXIAL RESISTANCE ϕR_N	130.00 KIPS
MAX. APPLIED AXIAL LOAD Q	49.10 KIPS
MIN. APPLIED AXIAL LOAD Q	111.19 KIPS
SERVICE LIMIT STATE	
NOMINAL LATERAL RESISTANCE R_N	72.40 KIPS
BASED UPON ½" OF HORIZONTAL MOVEMENT	
LATERAL RESISTANCE FACTOR ϕ	1.00
FACTORED LATERAL RESISTANCE ϕR_N	53.00 KIPS
FACTORED LATERAL APPLIED LOAD P_V	21.60 KIPS

EXTREME LIMIT STATE – N/A

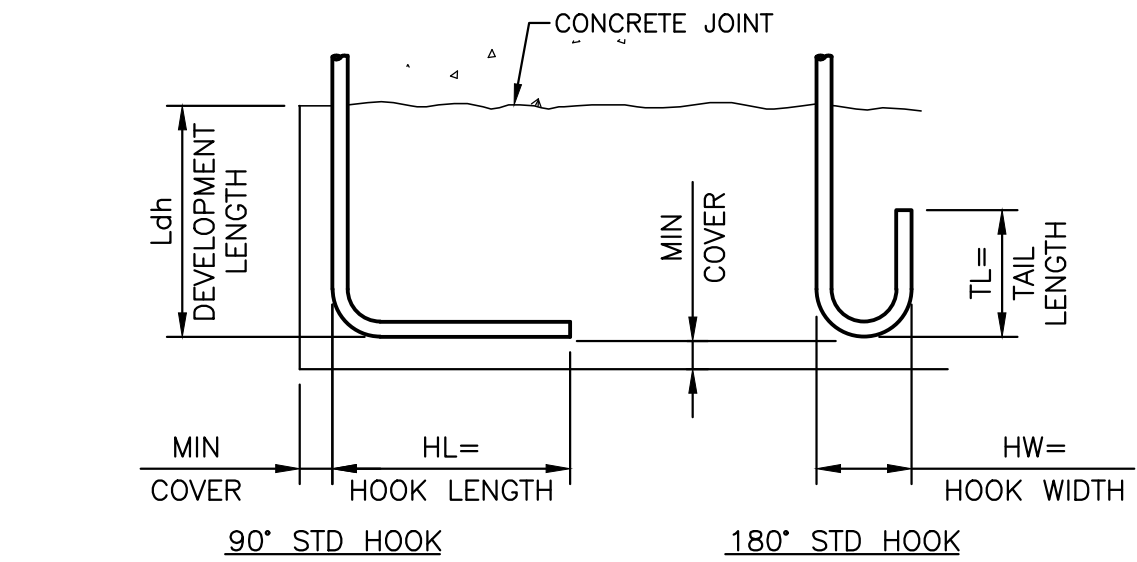
REBAR LAP SPLICE SCHEDULE (AASHTO 9TH EDITION)				
	CLASS A		CLASS B	
BAR SIZE (#)	TOP BAR	OTHER BAR	TOP BAR	OTHER BAR
3	1'-3"	1'-0"	1'-7"	1'-3"
4	1'-7"	1'-3"	2'-1"	1'-8"
5	2'-0"	1'-7"	2'-7"	2'-0"
6	2'-5"	1'-11"	3'-1"	2'-5"
7	3'-0"	2'-4"	3'-11"	3'-1"
8	3'-11"	3'-1"	5'-1"	3'-11"
9	5'-0"	3'-11"	6'-6"	5'-0"
10	6'-4"	4'-11"	8'-3"	6'-5"
11	7'-10"	6'-1"	10'-1"	7'-10"
14	11'-3"	8'-8"	14'-7"	11'-3"
18	17'-8"	13'-8"	22'-11"	17'-8"

- NOTES:
- "TOP BARS" ARE HORIZONTAL BARS THAT HAVE 12: OR MORE CONC CAST IN THE MEMBER BELOW THE REINFORCING BAR.
 - CLASS A SPLICES MAY ONLY BE USED WHEN ONE-HALF OR LESS OF THE TOTAL REINFORCEMENT IS SPLICED WITHIN THE REQUIRED LAP LENGTH. CLASS B SHALL BE USED WHERE THE REQUIREMENTS OF CLASS A ARE NOT MET.
 - ALL EPOXY COATED BARS WITH COVER LESS THAN 3 BAR DIAMETERS OR CLEAR SPACING LESS THAN 6 BAR DIAMETERS, THE LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.5. FOR ALL OTHER EPOXY BARS THE SPLICE LENGTH SHALL BE MULTIPLIED BY 1.2.

LAP SPLICE SCHEDULE

SCALE: NTS

S123



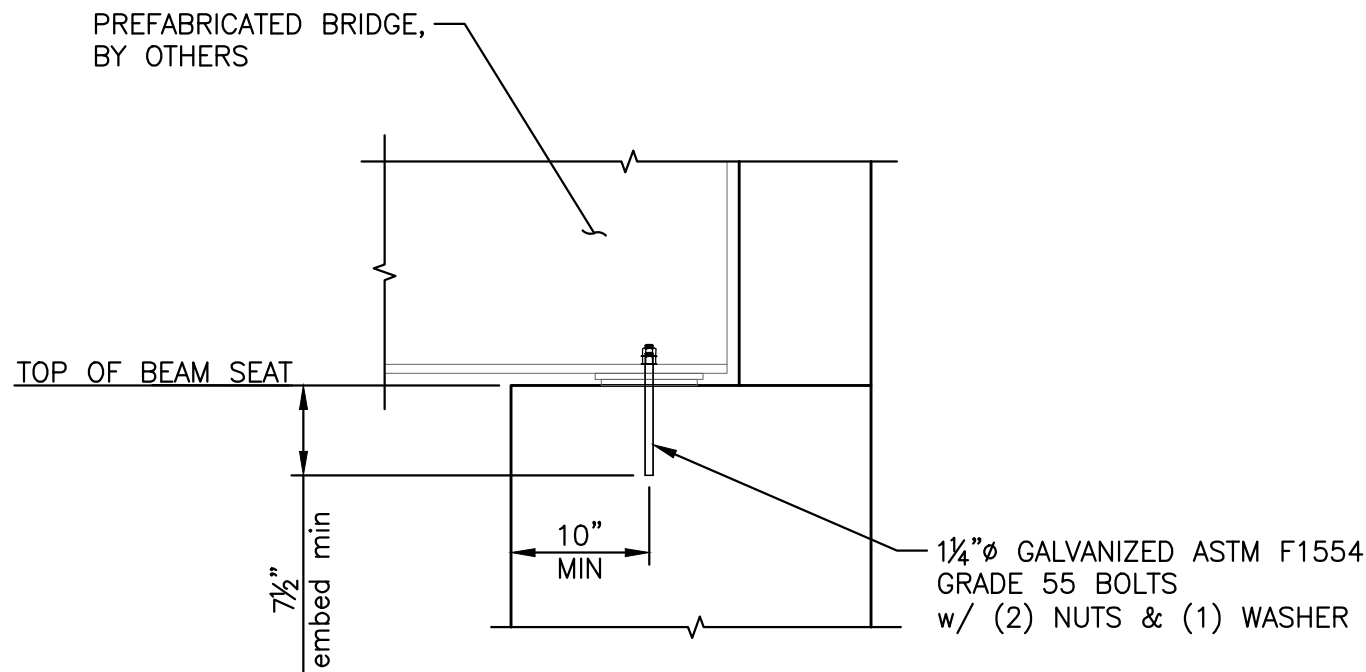
REINFORCING HOOK BAR SCHEDULE				
STANDARD HOOK LENGTH REQUIREMENTS PER AASTHO LRFD BRIDGE DESIGN SPECIFICATIONS				
BAR SIZE GRADE 60	l_{dh}	HL	HW	TL
3	7¼"	6"	3"	4"
4	9½"	8"	4"	4½"
5	1'-0"	10"	5"	5"
6	1'-2¼"	1'-0"	6"	6"
7	1'-4¾"	1'-2"	7"	7"
8	1'-7"	1'-4"	8"	8"
9	1'-9½"	1'-7½"	11¼"	10⅝"
10	2'-¼"	1'-9⅝"	1'-¾"	11½"
11	2'-3"	2'-0"	1'-2⅝"	1'-¾"
14	2'-8¼"	2'-6½"	1'-8¾"	1'-5"
18	3'-7"	3'-4⅝"	2'-3⅝"	1'-10⅝"

- NOTES:
- FOR f'_c LESS THAN 4,000 PSI, L_{dh} MUST BE RECALCULATED.
 - FOR EPOXY COATED REINF, L_{dh} MUST BE RECALCULATED.
 - MIN COVER SHALL BE PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 - THIS TABLE REQUIRES THAT ALL MINIMUM COVER REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS BE FOLLOWED, OTHERWISE L_{dh} SHALL BE RE-CALCULATED.
 - SEE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR MODIFICATION FACTORS.

REINFORCING HOOK SCHEDULE

SCALE: NTS

S124



BEARING DETAILS

SCALE: NTS

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APPR				

TOMATO STAND FISH PASSAGE

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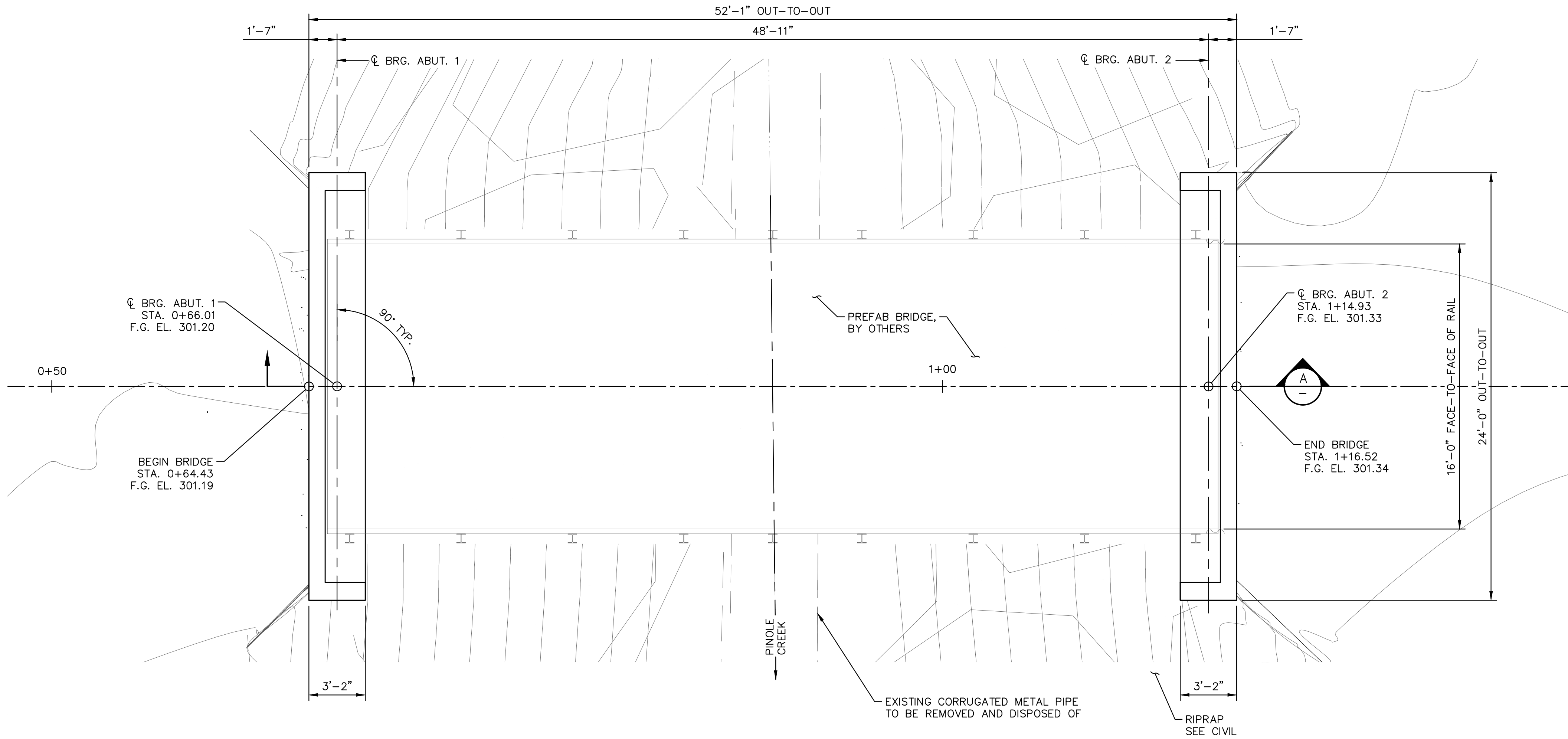
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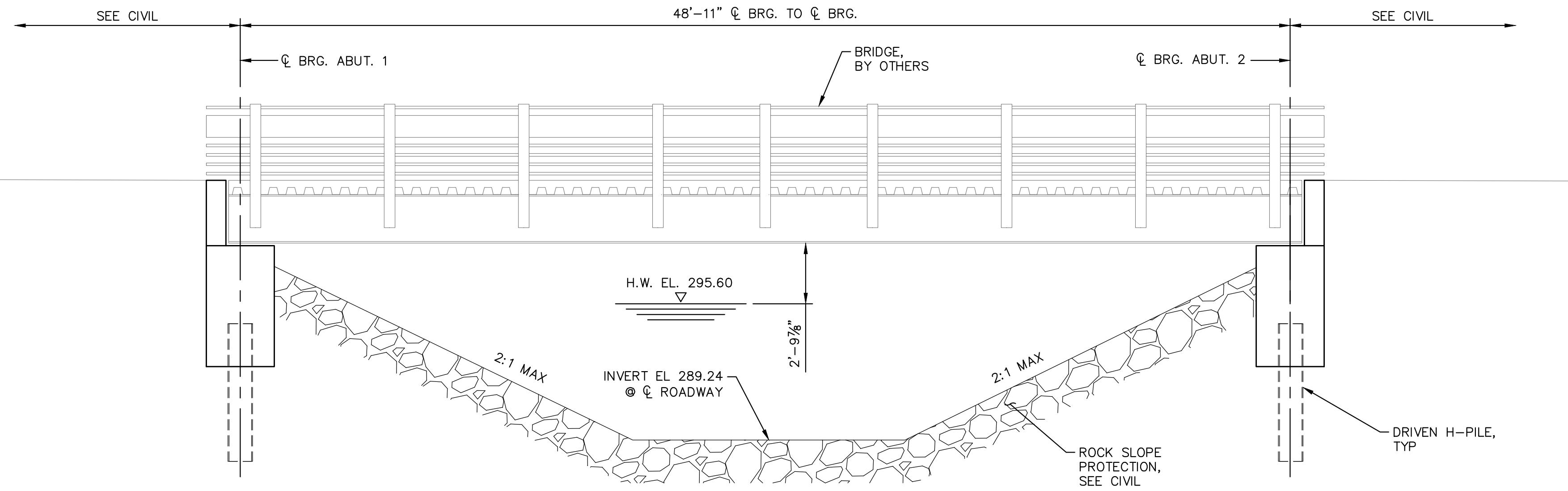
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OF XX



PLAN
SCALE: 1/4" = 1'-0"



ELEVATION
SCALE: 1/4" = 1'-0"

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REVISIONS			
NO.	DATE	DESCRIPTION	APPR.

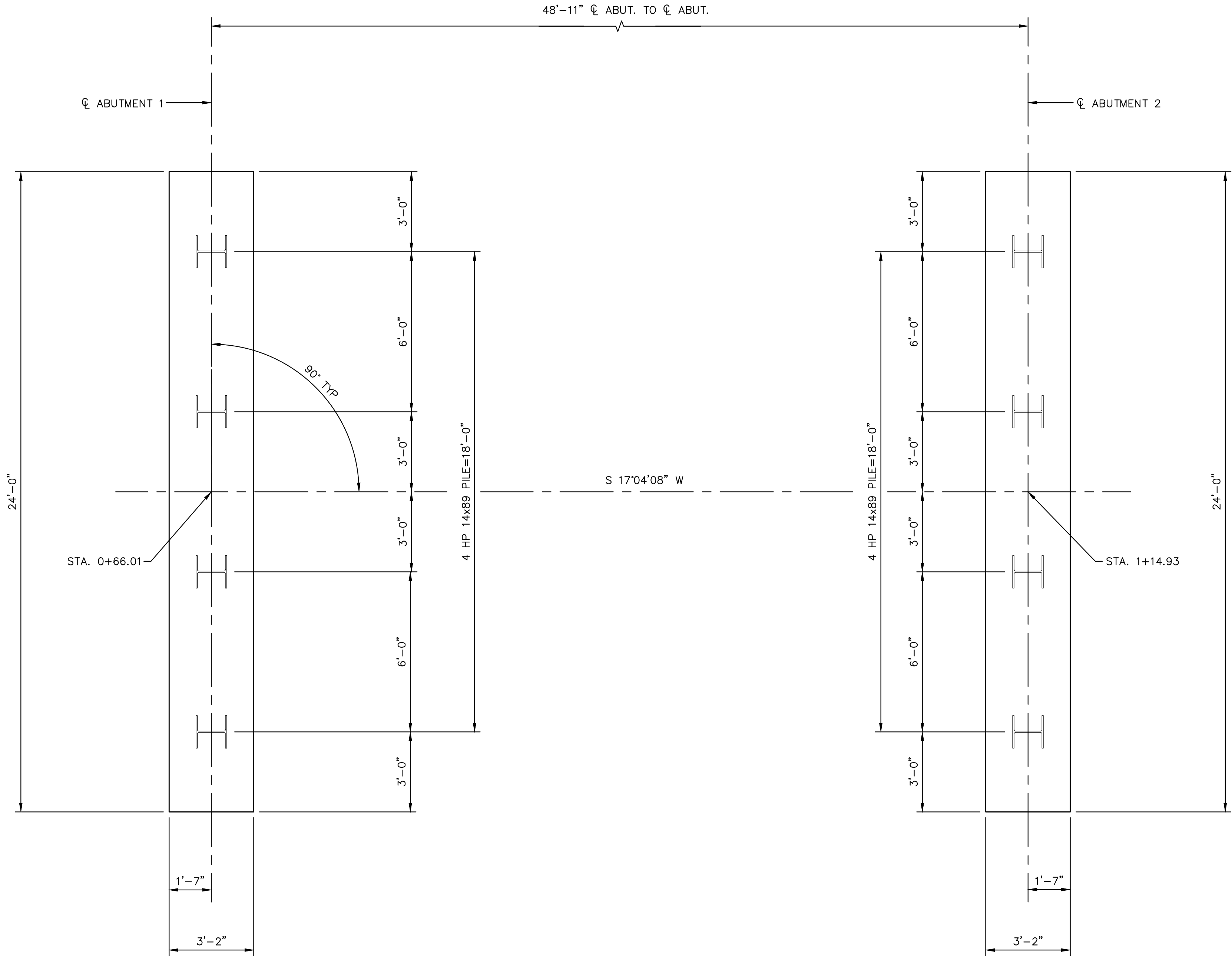
TOMATO STAND FISH PASSAGE

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PLAN AND ELEVATION

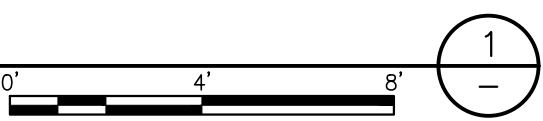
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OF XX



FOOTING LAYOUT

SCALE: 1/4"= 1'-0"



- NOTES**
- MATERIAL SPECIFICATIONS**
1. PROVIDE HP14X89 STEEL H-PILES THAT CONFORM TO ASTM A572 GRADE 50.
 2. PROVIDE SPLICE PLATES OF THE SAME MATERIAL AS THE STEEL H-PILES.
- WELDING**
3. QUALIFICATION OF WELDERS, MATERIALS, INSPECTION, AND PROCEDURES FOR WELDING ALL H-PILE WILL CONFORM TO THE CURRENT EDITION OF ANSI/AWS D1.1.
 4. PROVIDE WELDING QUALIFICATION TESTS TO DEMONSTRATE THE WELDABILITY OF PILES UNDER FIELD CONDITIONS FOR ALL TYPES OF WELDS TO BE MADE ON THE PILES.
 5. ATTACH ALL PILE POINTS AND PREFABRICATED SPLICERS BY WELDING IN ACCORDANCE WITH THE CURRENT EDITION OF ANSI/AWS D1.1. SUBMIT WELDING DETAILS AND PROCEDURES FOR APPROVAL.
- DRIVING DATA**
6. FURNISH THE TYPE AND ALL OPERATION SPECIFICATIONS OF THE HAMMER TO THE ENGINEER 15 CALENDAR DAYS BEFORE PILE DRIVING BEGINS.
 7. DRIVE PILES TO A MINIMUM BEARING CAPACITY OF 130 KIPS PER PILE AS DETERMINED BY A WAVE EQUATION ANALYSIS.
 8. THE RATED ENERGY FOR THE HAMMER USED FOR DRIVING PILES IS RECOMMENDED TO BE BETWEEN XX,XXX AND XX,XXX FOOT-POUNDS. THE RATED ENERGY RANGE MAY BE CHANGED IF APPROVED.
 9. NOTIFY THE ENGINEER BEFORE FURTHER PILE DRIVING IF THE HIGHEST PILE TIP ELEVATION IS NOT OBTAINED.
- MISCELLANEOUS**
10. PILE TIP ELEVATIONS ARE SHOWN FOR ESTIMATING PURPOSES ONLY.
 11. ESTIMATED PILE LENGTHS ARE COMPUTED FROM PILE CUT-OFF AND ESTIMATED PILE TIP ELEVATIONS.

PILE SCHEDULE				
LOCATION	NO.	ELEVATION		ESTIMATED PILE LENGTH (FT)
		PILE CUT-OFF	PILE TIP	
ABUT 1	4	293.73	261.73	32
ABUT 2	4	293.88	261.88	32

REVIEWS		DESCRIPTION	DATE	NO.

TOMATO STAND FISH PASSAGE

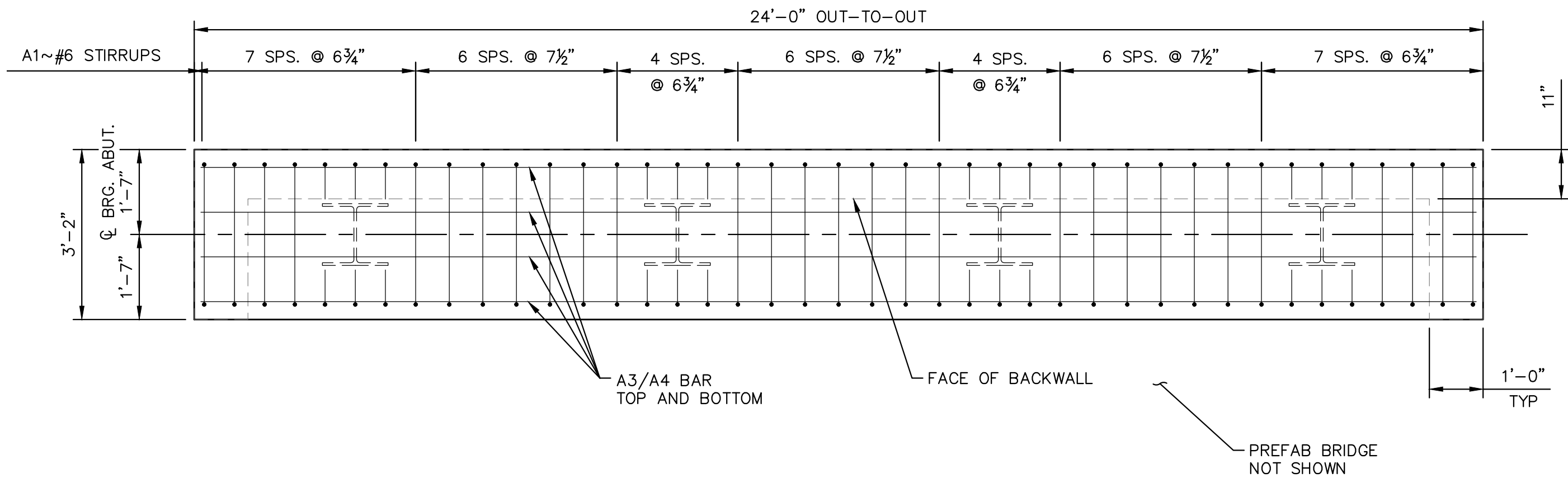
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FOUNDATION LAYOUT



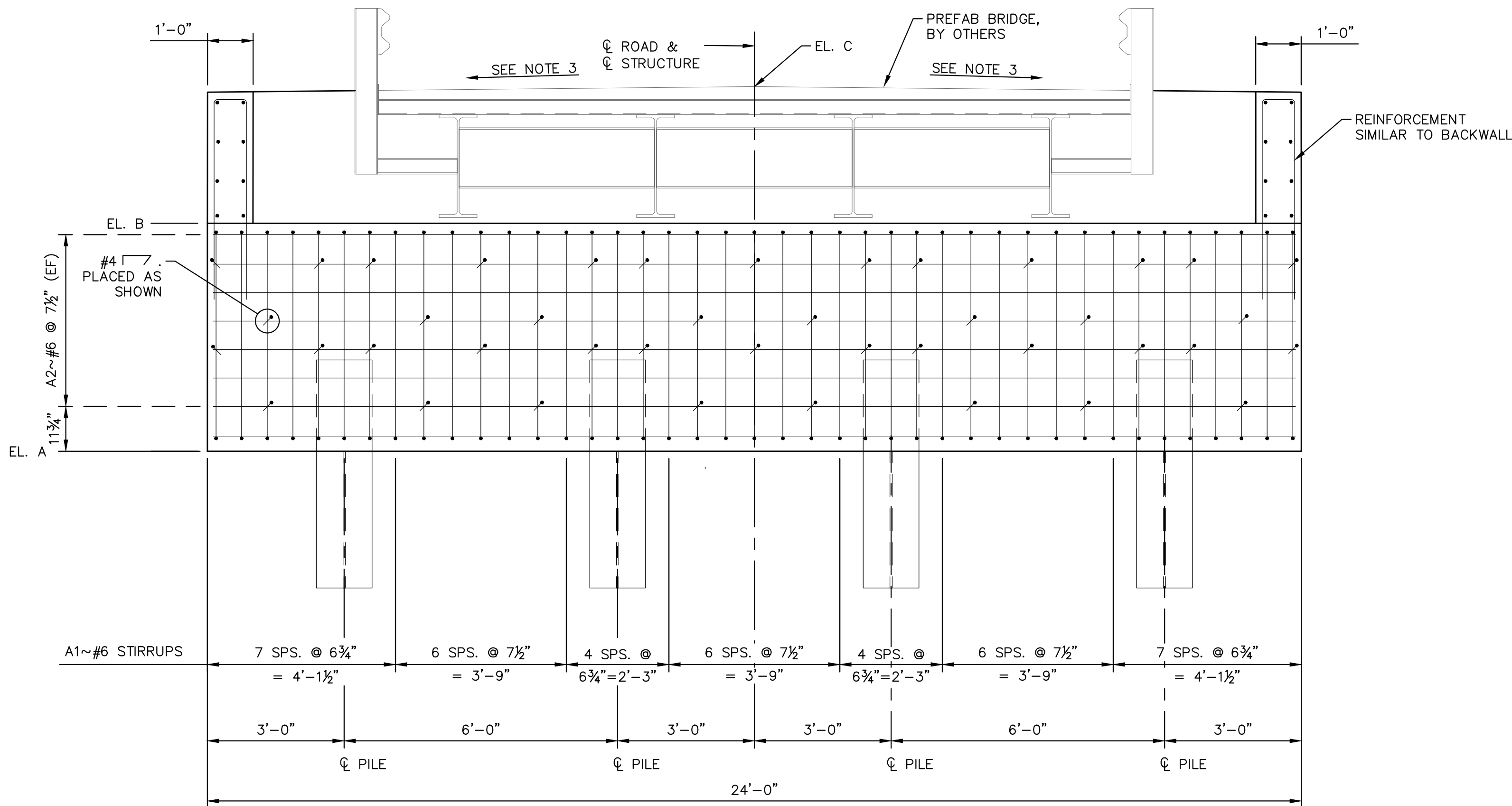
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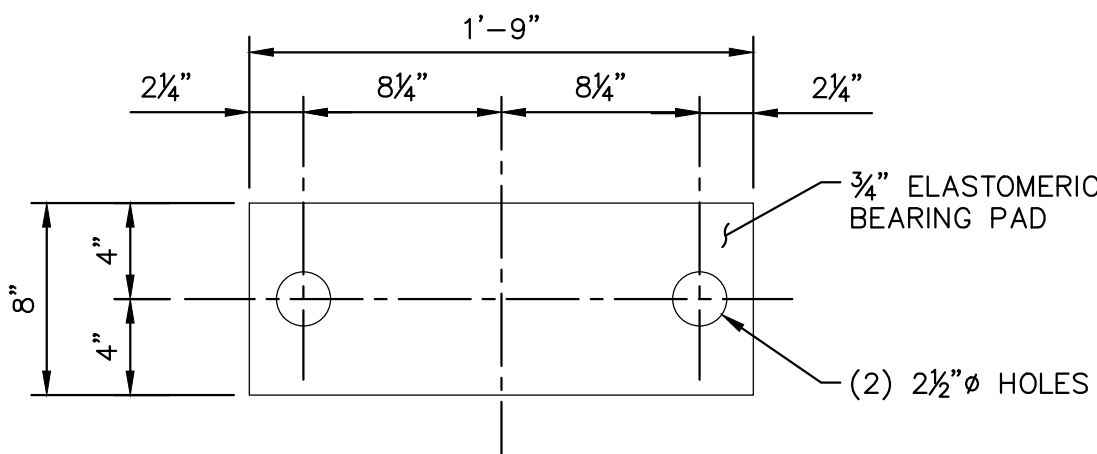
ABUTMENT PLAN

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



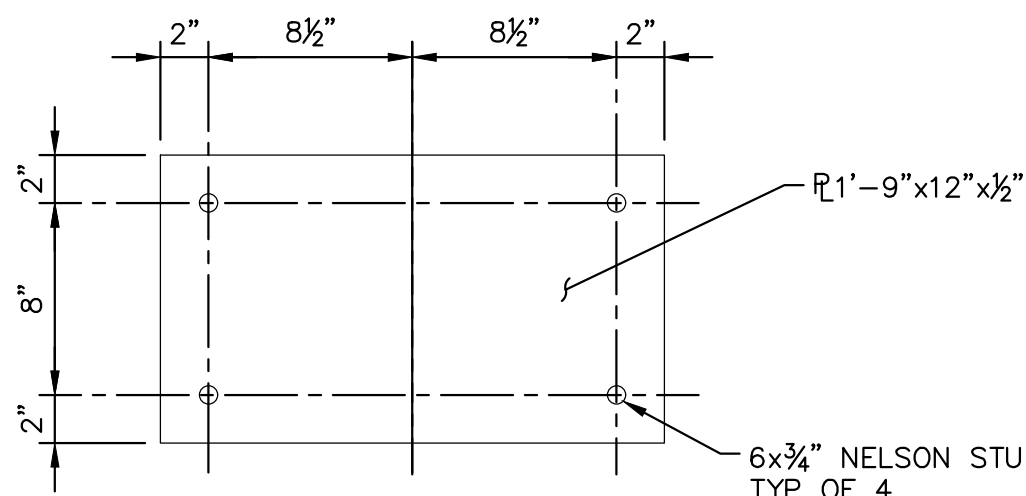
ABUTMENT ELEVATION

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



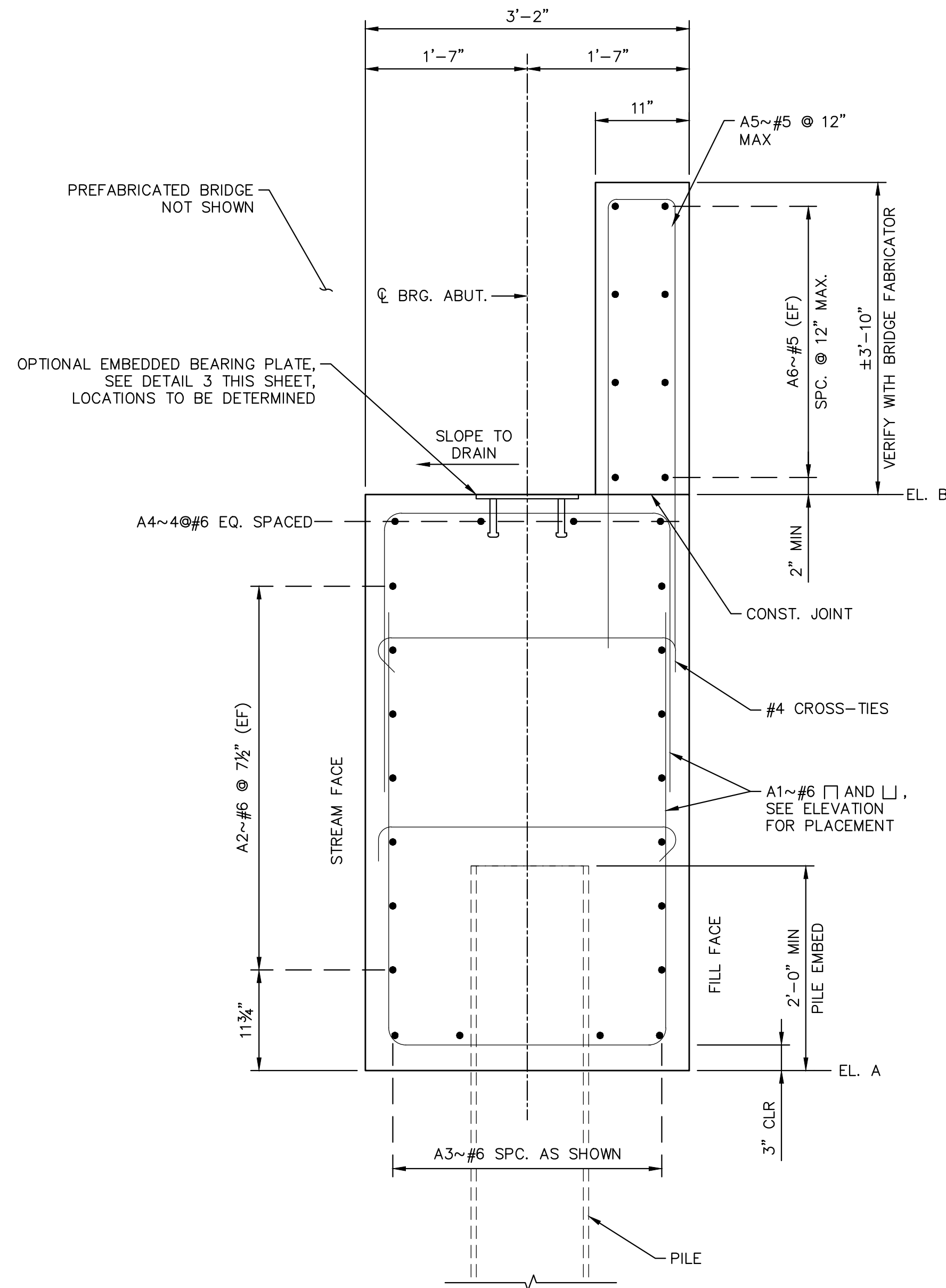
BEARING DETAIL

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



OPTIONAL PLATE DETAIL

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



ABUTMENT SECTION

SCALE: 1" = 1'-0"

ELEVATION TABLE		
	ABUTMENT 1	ABUTMENT 2
EL. A	291.73	291.88
EL. B	297.36	297.51
EL. C	301.19	301.34

NOTE
1. VERIFY ELEVATION "B" WITH BRIDGE FABRICATOR PRIOR TO FABRICATION.

PRELIMINARY
NOT FOR CONSTRUCTION

- NOTES
- CROSS-TIES MUST BE HOOKED AROUND HORIZONTAL AND VERTICAL REINFORCEMENT PLACED AS SHOWN.
 - BEARING PAD SHALL BE SHORE A, 50 DUROMETER, BUTYL RUBBER SHEET CONFORMING TO ASTM D2000.
 - SLOPE TOP OF BACKWALL TO MATCH BRIDGE CROSS-SLOPE.

REVISIONS		DESCRIPTION	DATE	NO.
NO.	DATE			

TOMATO STAND FISH PASSAGE

90% DESIGN
(NOT FOR CONSTRUCTION)

SECTIONS AND
DETAILS 1



DESIGN BY JF
DRAWN BY BR, JF
CHECKED BY GH, CB
SCALE AS NOTED
DATE 4/21/2025
SHEET

SECTION 01 35 43 – TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. The General Conditions and the Supplementary Conditions shall apply to all of the work of every Section or Subsection of these specifications as if fully repeated in each.
- B. Summary of work: Provide all material, labor and equipment necessary to complete all work as shown on the drawings and as specified herein, including, but not limited to, the following:
 - 1. All workers shall complete an on-site training session given by an EBMUD Biologist.

1.02 REFERENCES

- A. Standard Specifications or State Standard Specifications – 2022 Standard specifications of the State of California, California State Transportation Agency, Department of Transportation, CALTRANS.

1.03 SUBMITTALS

- A. Provide a list of workers for on-site training by the EBMUD Biologist.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Regional Water Quality Control Boards (RWQCB)
 - a. 401 Certification
 - 2. US Army Corps of Engineers (USACE)
 - a. 404 Permit
 - 3. US Fish and Wildlife Service (USFWS)
 - a. Biological Assessment
 - b. EBMUD Habitat Conservation Plan avoidance measures
 - 4. National Marine Fisheries Service
 - a. NMFS Programmatic Biological Opinion for restoration projects

1.05 PROJECT CONDITIONS

- A. General
 - 1. Construction must comply with all regulatory permit conditions.
- B. Environmental Requirements
 - 1. Work on site shall only take place during approved workdays and approved work hours.
 - a. The allowed In-Channel seasonal work window is August 15 to October 31 under dry site conditions.
 - b. Work activities will occur during daylight hours and will be limited to 7 a.m.–7 p.m.

- c. No earthwork shall be conducted during or within 24-hours of a rain event (0.25 inches in a 24-hour period).
- 2. Confine work activities to Limit of Work as shown on the plans and approved construction work areas, staging areas, and access routes.
 - a. Delineate the project area using high visibility temporary fencing, flagging, or other barrier. Inspect and maintain fencing for the duration of the project and only remove fencing once all construction equipment has been removed from the site.
 - b. No additional access routes, staging areas or parking areas may be used without EBMUD's prior approval.
- 3. Biological Accommodations
 - a. Contractor will accommodate as part of the required work EBMUD biologists to survey the work area immediately prior to construction activities.
 - b. If sensitive species are found, the Contractor will allow for timely relocation of species by the EBMUD biologist, e.g. California red-legged frog, Northwestern Pond Turtle, steelhead and Alameda Whipsnake.
 - c. Only EBMUD biologists shall participate in activities associated with the capture, handling, and monitoring of sensitive fish and wildlife species.
 - d. Avoid working within any wildlife buffer created by the EBMUD Biologist for construction.
 - e. Immediately contact Resource Agencies for guidance if any salmonids or other special status species are found dead or injured at any point during the Project.
 - f. Accommodate and maintain no-disturbance buffer areas around any protected raptor and migratory bird nests as determined by EBMUD biologists.
 - g. Where indicated in plans, clearly mark and protect trees to be preserved and maintain tree protection fencing for the duration of the project.
 - h. Coordinate with Landscape Architect and EBMUD Project Manager to evaluate trees marked for removal in plans for reuse on site as habitat structures.
 - i. Wash ground disturbing equipment used adjacent to the riparian corridors (including wheels, tracks, and undercarriages) both before and after being used at the site.
- 4. Excavations shall not be left open overnight.
 - a. Where not backfilled, trenches shall be tightly covered. Perimeters of plywood panels or other covers shall be edged with dirt to prevent intrusion of small animals.
 - b. Trenches shall include a ramp with a maximum slope of 1:1 to allow animals to escape the excavation when not covered.
- 5. All workers shall attend an approximately one-hour long on-site Contractor Environmental Awareness Training session conducted by a USFWS-approved EBMUD Biologist at the start of construction.
 - a. All site supervisors and workers of the contractor and subcontractors shall attend the training. Workers who do not attend the training at the start of construction shall attend a subsequent training session. The Contractor shall

notify the EBMUD Project Manager one week prior to the anticipated arrival of new workers, in order to schedule a training session.

- b. Only workers who have completed the training shall be allowed to work on site. At the discretion of the Biological Monitor, untrained workers may perform one-time deliveries and similar minor construction support activities where there is no ground disturbance, provided that they are supervised by a trained member of the Contractor's supervisory staff.
- c. The EBMUD Project Manager or Biological Monitor may stop construction until untrained workers are either off site or trained.
- d. The Biological Monitor is on site to observe construction activities, so the Contractor may not work on site while the Biological Monitor is training workers.
- e. The purpose of the training is to:
 - 1) Familiarize personnel with rare, threatened and endangered species which may be present at the work site.
 - 2) Provide an overview of the laws, regulations and violation penalties governing protection of the species.
 - 3) Provide directions and information on how to avoid and minimize contact with the species, and what to do if they are encountered.

C. Dust Control

- 1. Contractor shall use all means necessary to prevent the spread of dust during performance of the work. Thoroughly moisten all surfaces as required to prevent the generation of dust.
- 2. Implement the following applicable Bay Area Air Quality Management District's (BAAQMD's) Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust:
 - a. Water all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) daily.
 - b. Cover all haul trucks transporting soil, sand, or other loose material off-site shall be covered.
 - c. Limit all vehicle speeds on unpaved roads shall to 15 mph.
 - d. Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure [13 CCR Section 2485]).
 - e. Maintain and properly tune all construction equipment in accordance with manufacturer's specifications. Arrange for all equipment to be checked by a certified mechanic to confirm the equipment is running in proper condition prior to operation.

D. Construction Requirements

- 1. General
 - a. All mechanized equipment, including excavator, backhoe, and ten-wheel dump truck, shall avoid wetted channels.

- b. Vehicles will be parked on pavement, existing roads, and previously disturbed areas to the maximum extent feasible.
 - c. Maintain a neat and orderly jobsite and properly dispose of all trash daily. Following construction, remove all debris from the work area.
2. Hazardous Materials Storage/Disposal
- a. Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into State waters or its tributaries will be contained in watertight containers, located as far as possible from a direct connection to surface water, or removed from the project site.
 - b. Use biodegradable chainsaw bar oil.
 - c. Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
 - d. Store hazardous materials and wastes in watertight containers, store in appropriate secondary containment, and cover them at the end of every workday or during wet weather or when rain is forecast. As appropriate, label containers with a "Hazardous Waste" label.
 - e. Follow manufacturer's application instructions for hazardous materials and use the smallest amount possible. Do not apply chemicals outdoors when rain is forecast within 24 hours.
 - f. Arrange for appropriate disposal of all hazardous wastes.
3. Spill Prevention
- a. Designated field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills.
 - b. Procure equipment and materials for cleanup of spills and store on site. Prepare spill response kits to utilize when hazardous materials are in use (e.g., at crew trucks and other logical locations). Communicate the locations of spill response kits to all field personnel.
 - c. Address spills and leaks immediately according to the following guidelines:
 - 1) For small spills on impervious surfaces, use absorbent materials to remove the spill, rather than hosing it down with water.
 - 2) For small spills on pervious surfaces such as soil, excavate and properly dispose of the spilled material.
 - 3) Absorbent materials will be collected and disposed of properly and promptly.
 - d. Routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained.
4. Vehicles and Equipment
- a. Confine work activities to approved construction work areas, staging areas and access routes.
 - b. Fueling and servicing of equipment and vehicles shall take place a minimum of 200 feet from the top of the creek bank. If emergency repairs are required,

make only the repairs necessary to move equipment to a more secure location.

- c. If necessary to service equipment at the job site, designate a protected area for equipment servicing to reduce threats to water quality from vehicle fluid spills. Designated areas shall not directly connect to the ground or surface water. Clearly designate the service area with berms, sandbags, or other barriers. Utilize secondary containment, such as a drain pan, to catch spills or leaks when removing or changing fluids. Store fluids in appropriate containers with covers and recycle or dispose of at an appropriate off-site location.
- d. Thoroughly clean equipment of soil and vegetation before being delivered to the site to minimize the potential for spreading pathogens or exotic/invasive species. Inspected equipment and reject if determined to not be adequately clean.
- e. Vehicle and equipment washing can occur on site only as needed to prevent the spread of sediment, pathogens, or exotic/invasive species. No runoff from vehicle or equipment washing will be allowed to enter water bodies without being subjected to adequate filtration (e.g., vegetated buffers, hay wattles or bales, and silt screens).
- f. Check incoming equipment for leaking oil and fluids. Do not allow leaking equipment on the Project site.
- g. Keep all vehicles and equipment clean. Do not permit excessive build-up of oil and grease.

5. Wildfire Risk

- a. Equip all earthmoving and portable equipment with internal combustion engines with spark arrestors.
- b. During the high fire danger period (April 1–December 1), ensure that work crews:
 - 1) Have appropriate fire suppression equipment available at the work site.
 - 2) Keep flammable materials, including flammable vegetation slash, at least 10 feet away from any equipment that could produce a spark, fire, or flame.
 - 3) Do not use portable tools powered by gasoline-fueled internal combustion engines within 25 feet of any flammable materials unless a round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).

6. Bridge Construction

- a. Bridge concrete footings and abutments shall be poured in place from above the top of the bank and will not have contact with channel flow.
- b. If the channel is wetted (no functioning dewatering), each bridge span will be lowered into place by a crane or other equipment operated from above the bank.

7. Concrete Work

- a. Any and all concrete structures that may come in contact with channel flows (e.g., piers, abutments, wingwalls) shall be poured by September 31 unless authorized in writing by CDFW. See permit for full requirements.

8. Sudden Oak Death Avoidance (phytophthora)
 - a. EBMUD employees and contractors working on routine maintenance projects will receive training (at least annually) that includes information on Phytophthora diseases and how to prevent the spread of these and other soil-borne pathogens by following approved phytosanitary procedures.
 - b. At the start of work at each new job site, worker clothes should be free of all mud or soil, including boots. If clothes are not freshly laundered, before arriving at the site, workers will remove all debris and adhered soil with a stiff brush. Prior to arriving at the site, all gear should be cleaned with brushes, air or water to remove as much visible mud and debris as possible.
 - c. At the end of the workday, scrub, brush and pick off soil, vegetation or other debris from shoes, saws, vehicles and other equipment at the work site.
 - d. Vehicles and Large Equipment. Before arrival at construction sites, vehicles and large equipment must be free of soil and debris including on tires, wheel wells, vehicle undercarriages, and other surfaces.
9. Cultural Resources
 - a. Conduct a pre-construction meeting with an EBMUD-appointed person qualified in archaeology or cultural resources to brief construction personnel to the possibility of archaeological or cultural resources within the Project area and the procedures to follow regarding discovery.
 - b. If cultural resources are encountered during the Project, construction personnel shall avoid altering these materials and their context until a Professional Archaeologist has evaluated the situation. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, and pestles; and dark, friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials. Historical resources include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits, often in old wells and privies.
 - c. If the Professional Archaeologist determines that any cultural resources exposed during construction constitute a historical resource and/or unique archaeological resource, he/she shall notify the Partner Agencies and other appropriate parties of the evaluation and recommended measures to mitigate effects to a less-than significant impact. Mitigation measures may include avoidance, preservation in-place, recordation, additional archaeological testing and data recovery, among other options. Treatment of any significant cultural resources shall be undertaken with the approval of the U.S. Bureau of Reclamation and other lead agencies.
 - d. Any identified cultural resources shall be recorded on forms DPR 422 (archaeological sites) and/or DPR 523 (historic properties) or similar forms by a Professional Archaeologist.
 - e. The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity within the Project area shall comply with applicable State laws. This shall include immediate notification of the Contra Costa County Coroner (Contra Costa County Sheriff's Office).

- f. In the event of the coroner's determination that the human remains are Native American, notification of the Native American Heritage Commission (NAHC) is required. The NAHC shall be notified by phone within 24 hours of the discovery and shall be afforded the opportunity to appoint a Most Likely Descendant (MLD) (PRC Section 5097.98).
- g. If paleontological resources are discovered during earthmoving activities, the construction crew would immediately cease work near the find. In accordance with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), a qualified paleontologist would assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and mitigation.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 35 43 – TEMPORARY ENVIRONMENTAL CONTROLS

SECTION 03 11 00
CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Furnish and install formwork for cast-in-place concrete.

B. Related sections:

1. Section 03 30 00 – Cast-in-Place Concrete
2. Section 03 35 00 – Concrete Finishing

1.2 QUALITY ASSURANCE

A. Design Criteria:

1. Formwork, including forms, falsework, shoring, bracing, and accessories such as ties, anchors and hangers, shall be designed in accordance with Chapter 1 of ACI 347 – American Concrete Institute Standard Recommended Practice for Concrete Formwork.
2. The design and construction of forms and form supports shall be subject to approval of the Engineer, but responsibility for their adequacy shall rest with the Contractor.

B. Tolerances:

1. Formwork shall be constructed and maintained as required to produce completed work within the tolerance limits specified in Chapter 2 of ACI 347.
2. The following construction tolerances are hereby established and apply to finished walls and slabs unless otherwise shown:

<u>Item</u>	<u>Tolerance</u>
Variation of constructed linear outline from the established position in plan.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2 inch
Variation from the level or from the grades shown.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2 inch
Variation in the thickness of slabs and walls.	Plus 1/2 inch, Minus 1/4-inch
Variation in the location and sizes of slabs and wall openings	Plus or minus 1/4-inch

1.3 SUBMITTALS

- A. Submit detailed plans of the falsework proposed to be used to the Engineer for acceptance. Such plans shall be in sufficient detail to indicate the general layout, sizes of members, anticipated stresses, grade of materials to be used in the falsework, means of protecting existing construction which supports falsework, and typical soil conditions. Submit prior to start of work.
- B. Metal forms
- C. Form Release Agent

1.4 JOB CONDITIONS

- A. Falsework and vertical shoring:
 - 1. Design, construction, inspection, and removal of falsework and vertical shoring shall be in full conformance with the provisions of Section 1717 of the Construction Safety Orders, Title 8, California Code of Regulations.
 - 2. All falsework or vertical shoring installations where the height of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet shall be approved and signed by a civil engineer, registered in the State of California.
 - 3. A copy of the approved falsework plan or shoring layout shall be available on the job site at all times.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plywood for forms shall be Plyform Class I, B-B EXT-APA, conforming to the specifications of the U. S. Department of Commerce Voluntary Product Standard PS-1 requirements.
- B. Form ties:
 - 1. General
 - a. Form ties shall be of sufficient strength and number to prevent spreading of the forms during the placement of concrete and to permit ready removal of the forms without spalling or damaging the concrete.
 - b. Space ties at uniform intervals across surface; align in horizontal and vertical directions.

- c. Do not use wire ties or wood spreaders of any type.
- d. Provide form ties of such design that when forms are removed, they leave no metal or other material within 1-1/2 inches of the surface of the concrete. No form-tying device or part thereof other than metal shall be left imbedded in the concrete.

2. Cone-snap ties:

- a. Cone-snap ties shall form a cone shaped depression in the concrete with a minimum diameter of 1 inch at the surface of the concrete and 1-1/2 inches deep.
- b. Provide neoprene Waterseal washer that is located near the center of the concrete.

3. Taper ties:

- a. Neoprene plugs for taper tie holes: Size so that after they are driven, plugs are located in center third of wall thickness.

C. Form Release Agent:

- 1. When required to prevent bond, forms shall be treated with an approved compound which is not deleterious to concrete and which will not cause discoloration of the finished surface.

D. Falsework and shoring:

- 1. Falsework and forms shall be constructed to produce in the finished work the lines and grades indicated on the drawings.
 - a. Suitable jacks, wedges, or camber strips shall be used in connection with falsework to set the forms to the required grade or camber and to take up any settlement in the formwork either before or during the placing of concrete.
 - b. Falsework shall be formed upon solid footing safe against undermining and protected from softening.
- 2. Manufactured shores of adjustable type shall not be used if wear, damage, or defects make them incapable of supporting the loads for which they were designed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surfaces of all forms in contact with concrete shall be clean, rigid, tight, and smooth unless otherwise specified.
- B. Reusable forms shall be of such a type that they can be entirely removed and remain watertight upon reuse.

3.2 CONSTRUCTION OF FORMS

- A. Form panels that are attached directly to the studding or joists, shall be not less than 5/8-inch thick, and the studding or joists shall be placed not more than 12 inches center-to-center.
- B. Form panels less than 5/8-inch thick, otherwise conforming to the requirements specified in this section, may be used with a continuous backing of surfaced material 3/4-inch thick.
- C. Form panels more than 5/8-inch thick attached to studding or joists spaced at more than 12 inches center-to-center may be used, provided that deflection of the panel between studding or joists does not exceed that of a 5/8-inch panel attached to studding or joists spaced at 12 inches center-to-center.
- D. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar defects in the finished concrete exceeding the allowable irregularities for the formed finishes specified.
- E. Exposed edges on the outside and inside of structures shall be chamfered with triangular fillets 3/4" by 3/4", unless otherwise noted on the drawings or ordered by the Engineer.
- F. Openings shall be provided sufficient in size and number to permit convenient access to clean, inspect, and place concrete within the forms properly.
- G. Where forms for continuous surfaces are placed in successive units, the forms shall fit tightly over the completed surface so as to prevent leakage of mortar from the concrete and to maintain accurate alignment of the surface.
- H. Reset forms shall overlap the hardened concrete with sufficient tie bolts so as to prevent loss of mortar or spreading of the forms when concrete placement is resumed.
- I. Set and maintain concrete forms so as to ensure that the completed work is within the tolerances specified herein.

- J. Forms for outside surfaces shall be constructed with stiff wales at right angles to the studs, and all form ties shall extend through and be fastened to wales.
- K. Form ties:
1. Cone-snap ties: Tie forms together at not more than 2-foot centers vertically and horizontally. After forms are removed from wall, fill tie holes as follows:
 - a. Remove form ties from surfaces.
 - b. Roughen cone shaped tie holes by heavy sandblasting before repair.
 - c. Dry pack cone shaped tie holes with dry-pack mortar as specified in Section 03 60 00.
 2. Taper ties:
 - a. After forms and taper ties are removed from wall, plug tie holes with neoprene plug as follows:
 - 1) Heavy sandblast and then clean tie holes.
 - 2) After cleaning, drive neoprene plug into each of taper tie holes with steel rod. Final location of neoprene plug shall be in center third of wall thickness. Bond neoprene plug to concrete with epoxy.
 - 3) Locate steel rod in cylindrical recess, made in plug, during driving.
 - a) At no time are plugs to be driven on flat area outside cylindrical recess.
 - b. Dry-pack of taper tie holes: After installing plugs in tie holes:
 - 1) Coat tie hole surface with epoxy bonding agent and fill with dry-pack mortar as specified in Section 03 60 00.
 - a) Place dry-pack mortar in holes in layers with thickness not exceeding tie hole diameter and heavily compact each layer.
 - b) Dry-pack the outside of the hole no earlier than 7 days after the inside of the hole has been dry-packed.
 - c) Wall surfaces in area of dry-packed tie holes: On the water side of water containing structures and the outside of below grade walls:
 - i) Cover with minimum of 10 mils of epoxy gel

- ii) Provide epoxy gel coating on wall surfaces that extend minimum of 2 inches past dry-pack mortar filled tie holes
- iii) Provide finish surfaces that are free from sand streaks or other voids

3.3 REMOVAL OF FORMS

- A. Forms for columns, walls, sides of beams and other parts not supporting the weight of the concrete may be removed only after the concrete has sufficient strength to resist damage from deflection, misalignment, cracking, spalling, and form removal operations, particularly when form ties will be bent by the removal operations.
- B. Falsework and forms supporting cast-in-place concrete beams, slabs, or other members subject to bending stresses shall not be removed or released less than 21 days after the concrete has been placed or until the concrete has reached the specified minimum compressive strength, whichever comes first.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Furnish and install reinforcement of the shape and dimensions shown on the drawings and as specified herein.
- B. Related Sections:
 - 1. Section 03 11 00 – Concrete Forming
 - 2. Section 03 30 00 – Cast-in-Place Concrete

1.2 QUALITY ASSURANCE

- A. Reinforcement furnished shall be subject to rigid inspection, and no material shall be shipped until all tests, analyses, and final inspections have been made and the work has been accepted by the Engineer.
 - 1. Certificates and tests will not be required if, in the opinion of the Engineer, the reinforcement is of such minor quantity that specified certificates and tests are impractical.
- B. Mill tests and tags:
 - 1. Each bundle of steel shall be tagged by the mill with an identifying mill tag showing the name of the mill and the melt or heat number for the steel.
- C. Test samples and approval:
 - 1. Engineer may sample reinforcement at the source of supply or at point of distribution.
 - a. Two or more samples, each 24 inches long, may be taken at random from each size of bar in each melt or heat.
 - b. Contractor shall furnish test samples at no additional expense to the District.
 - 2. Engineer will attach a tag to each bundle of steel that has been inspected, tested, and approved by the Engineer.

1.3 SUBMITTALS

- A. Submit seven (7) sets of reinforcement lists, locations, diagrams, details, and bending diagrams to the Engineer, before reinforcement is fabricated.
- B. Submit a certified copy of mill test of each heat, showing physical and chemical analysis to the Engineer at the time of sampling.
- C. Submit a shipping invoice for each shipment showing the weight and heat number of each size of bar.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing steel:
 - 1. Deformed bars: ASTM A615 Grade 60
- B. Bar supports:
 - 1. Supports and spacing of spacers per standards set forth by CRSI Manual of Standard Practice.
 - 2. Supports and spacers that extend to the surface of the concrete shall be noncorrosive and nonstaining.
- C. Tie wire:
 - 1. Wire shall be 18 gauge or heavier, black annealed.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Reinforcing steel shall be accurately fabricated to the dimensions shown on the drawings.
 - 1. Bends shall be made using pin sizes as recommended by the American Concrete Institute.
 - 2. Bars shall be bent cold unless preheating is approved in advance by the Engineer.
 - 3. Bars reduced in section or having kinks or bends not shown on the contract drawings will not be accepted.
 - 4. Fabrication shall be as required to provide the minimum cover as indicated on the drawings.

- B. Welding or mechanical connections as an aid to fabrication and/or installation will not be permitted except as specifically shown on the drawings, or as approved by the Engineer.

3.2 PLACING

- A. Reinforcing bars shall be accurately placed as shown on the design and placing drawings, shall be firmly and securely held in position by means of wiring at intersections, using approved bar supports so located and of sufficient strength to resist crushing or displacement under the full load of concrete as it is placed.
 - 1. Placing of bars in fresh layers of concrete will not be permitted.
 - 2. Tie wire ends shall be bent away from and shall not contact form work.
 - 3. Placing tolerances shall be as recommended by the CRSI "Practice for Placing Reinforcing Bars" except at specific locations where shown by the design drawings as requiring closer placing tolerances.
- B. Splicing of reinforcing bars shall be as shown or indicated on the drawings or as approved by the Engineer. Splices of tensile reinforcement at points of maximum stress shall be avoided. Unless otherwise shown on the design drawings, laps shall be Class B splices per ACI 318. Welded wire fabric shall be spliced either one wire spacing plus 2 inches, or 6 inches, whichever is greater.
- C. Welded or mechanical connections (if required) shall be made at locations shown on the drawings or as approved by the Engineer.
 - 1. Welded connections shall be per AWS D1.4, Latest Edition.
 - 2. Mechanical connections shall develop 125% of reinforcing bar yield strength in either tension or compression.
 - 3. Mechanical connections shall be per manufacturer's recommendations, conforming to the applicable code requirements.

END OF SECTION

SECTION 03 20 00 - REINFORCEMENT STEEL

PART 1 -- GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall provide reinforcement steel, accessories, and appurtenant WORK, complete and in place, in accordance with the Contract Documents.

1.2 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with Section 01 33 00 - Contractor Submittals. Submittals shall be provided at the earliest possible date after receipt by the CONTRACTOR of the Notice to Proceed.
- B. **Shop Drawings.** Shop drawings shall be provided for reinforcement steel, showing the details of the reinforcement steel which shall conform to ACI 315 - Details and Detailing of Concrete Reinforcement, and the requirements herein. Shop drawings shall include the following items:
 - 1. **Bending diagrams.** The shop bending diagrams shall show the actual lengths of bars to the nearest inch measured to the intersection of the extensions (tangents for bars of circular cross section) of the outside surface.
 - 2. **Placement diagrams.** Include bar placement diagrams. These diagrams shall also clearly indicate the dimensions of splices and where they occur.
 - 3. **Bar Quantities.** The quantity of bars shall be identified for each bar configuration.

1.3 QUALITY CONTROL

- A. If requested by the ENGINEER, the CONTRACTOR shall furnish samples from each heat of reinforcement steel in a quantity adequate for testing. Costs of initial tests will be paid by the OWNER. Costs of additional tests if material fails initial tests shall be the CONTRACTOR's responsibility.

PART 2 -- PRODUCTS

2.1 REINFORCEMENT STEEL

- A. **Bar Reinforcement.** Bar and spiral reinforcement shall conform to ASTM A 615 - Deformed and Plain Billet - Steel Bars, for Grade 60 reinforcement unless otherwise indicated.
- B. **Epoxy Coated Reinforcement Steel.** When epoxy-coated reinforcement steel is indicated on the Contract Drawings, the materials shall conform to ASTM A 775 - Epoxy - Coated Reinforcing Steel Bars. Accessories used with epoxy-coated reinforcement shall be compatible with the reinforcement, and not damage or cause deterioration to the reinforcement or its epoxy coating.

2.2 ACCESSORIES

- A. Accessories shall include necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers, and other devices to position reinforcement during concrete placement.
- B. **Bar supports.** Bar supports shall meet the requirements of the CRSI Manual of Standard Practice, including special requirements for supporting epoxy-coated reinforcing bars.
 - 1. Wire bar supports shall be CRSI Class 1 for maximum protection with a 1/8-inch minimum thickness of plastic coating that extends at least 0.5-inch from the concrete surface. Plastic shall be gray in color.
 - 2. Concrete blocks (i.e. dobies) used to support and position reinforcement steel shall have the same or higher compressive strength as required for the concrete in which they are located. Wire ties shall be embedded in concrete block bar supports.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Reinforcement steel, welded wire fabric, couplers, and other appurtenances shall be fabricated, and placed in accordance with the Building Code and the supplementary requirements herein.

3.2 FABRICATION

A. General

- 1. Reinforcement steel shall be accurately formed to the dimensions and shapes indicated, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318 - Building Code Requirements for Reinforced Concrete, except as modified by the Drawings.
- 2. Bars shall be bent cold. Bars shall be bent per ACI 318.
- 3. The CONTRACTOR shall fabricate reinforcement bars for structures in accordance with bending diagrams, placing lists, and placing drawings.

- B. **Fabricating Tolerances:** Bars used for concrete reinforcement shall satisfy the following fabricating tolerances:

Sheared Length	plus and minus 1-inch
Depth of Truss Bars	plus zero, minus 0.5-inch
Stirrups, ties, and spirals	plus and minus 0.5-inch
Other bends	plus and minus 1-inch

3.3 PLACING

- A. **General.** Reinforcement steel shall be accurately positioned as indicated and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. Tie wires shall be bent away from the forms in order to provide the required concrete coverage. Reinforcement steel shall be supported by concrete, plastic or metal support spacers, or metal hangers that are strong and rigid enough to prevent any displacement of the reinforcement steel. Concrete dobies used to support reinforcement steel shall be tied to the steel with wire ties that are embedded in the blocks.
- B. **Limitations on Bar Supports.** Limitations on the use of bar support materials shall be as follows.
 - 1. Concrete Dobies
 - a. Permitted at any location except where architectural finish is required.
 - b. Where concrete is to be placed on the ground, supporting concrete dobies shall be used in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous.
 - 2. Wire Bar Supports: permitted only at slabs over dry areas, interior dry wall surfaces, and exterior wall surfaces.
 - 3. Plastic Bar Supports: permitted at every location except on grade.
- C. **Placing Tolerances.** Unless otherwise indicated, reinforcement placing tolerances shall be within the limits in Section 7.5 of ACI 318 except where in conflict with the Building Code.
- D. **Adjusting Bar Locations.** Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter or enough to exceed the above tolerances, the resulting arrangement of bars shall be as reviewed and accepted by the ENGINEER.
- E. **Additional Bars.** Bars additional to those indicated that may be found necessary or desirable by the CONTRACTOR for the purpose of securing reinforcement in position shall be provided by the CONTRACTOR at its own expense.
- F. **Epoxy Coated Bars.** Epoxy-coated reinforcing bars shall be stored, transported, and placed in such a manner as to avoid chipping of the epoxy coating. Non-abrasive slings made of nylon and similar materials shall be used. Specially coated bar supports shall be used. Chips or cracks in the epoxy coating shall be repaired with a compatible epoxy repair material prior to placing concrete.

3.4 SPACING OF BARS

- A. **Clear Distances.**

1. The clear distance between parallel bars (except in columns and between multiple layers of bars in beams) shall be not less than the nominal diameter of the bars, nor less than 1-1/3 times the maximum size of the coarse aggregate, nor less than one-inch.
 2. Where reinforcement in beams or girders is placed in 2 or more layers, the clear distance between layers shall be not less than one-inch.
 3. The clear distance between bars shall also apply to the distance between a contact splice and adjacent splices or bars.
- B. **Bar Locations in Walls.** When used to space the reinforcing bars from wall forms, the forms and bars shall be located so that there is no deflection of the accessory when the forms are tightened into position.
- 3.5 SPLICING
- A. **General.** Splices shall only be used at locations indicated. When it is necessary to splice at points other than where indicated, the character of the splice shall be as reviewed and accepted by the ENGINEER. Unless otherwise indicated, dowels shall match the size and spacing of the spliced bar.
- B. **Splice Class.** The length of lap for reinforcement bars, unless otherwise indicated, shall be in accordance with ACI 318, Section 12.15.1 for a Class B splice.
- 3.6 BENDING OR STRAIGHTENING
- A. **Bending or Straightening:** Reinforcement shall not be straightened or rebent in a manner which will injure the material. Bars shall be bent or straight as indicated. Do not use bends different from the bends indicated. Bars shall be bent cold, unless otherwise permitted by the ENGINEER. No bars partially embedded in concrete shall be field-bent unless specifically permitted in writing by the ENGINEER.
- 3.7 CLEANING AND PROTECTION
- A. Reinforcement steel shall always be protected from conditions conducive to corrosion until concrete is placed around it.
- B. The surfaces of reinforcement steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be reinspected and, if necessary, recleaned.

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SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Cast-in-place concrete required for this work is shown on the drawings and includes:

1. Prefabricated steel bridge abutments and wing walls.

B. Related Sections:

1. Section 03 11 00 – Concrete Forming
2. Section 03 20 00 – Concrete Reinforcing
3. Section 03 35 00 – Concrete Finishing
4. Section 03 39 00 – Concrete Curing

1.2 QUALITY ASSURANCE

A. Qualifications of workers:

1. A foreman experienced in work being done shall be on the jobsite at all times.

B. Codes and Standards:

1. Comply with all pertinent recommendations of "Structural Concrete for Buildings", publication ACI 301 of the American Concrete Institute.
2. State of California Department of Transportation: Standard Specifications, latest edition (CSS).

C. Testing:

1. District will inspect and will perform concrete slump and strength tests. Strength tests on concrete cylinder samples will be performed in accordance with ASTM C39.
2. Strength tests on core samples will be performed in accordance with ASTM C42.

D. Concrete Samples:

1. Contractor shall provide all labor and equipment required to make the concrete samples, store them on site during initial cure, and deliver concrete cylinder

samples to EBMUD Materials Testing Laboratory located at the address listed in Article 1.3.

- a. Samples shall be made by an ACI certified Concrete Field Testing Technician in accordance with ASTM C31 and ASTM C172.
- b. Unless specified otherwise, one set of five 6"x12" cylinders shall be molded at the same time of each mix being placed, each day:
 - 1) At least once a day
 - 2) At least once for each 100 cubic yards placed, and
 - 3) At least once for each 5,000 square feet of surface area of slabs and walls.
- c. Label samples using a nomenclature provided by the Engineer.

E. Additional Core Samples and Tests:

1. If, in the opinion of the Engineer, results of tests on concrete cylinders indicate the possibility of substandard concrete in the structure, cored samples may be required to be taken from the placed concrete. The contractor shall provide all labor and equipment required to obtain the core samples.
 - a. The contractor shall take 3 cores of the area representing the cylinders in which the strength is in question and deliver them to EBMUD Materials Testing Laboratory for strength tests.
 - 1) Core samples shall be obtained in accordance to ASTM C42.
 - b. If the results of the core tests indicate the concrete that has been placed does not meet the specification, remove and replace the defective concrete at no additional cost to the District.
 - c. The Contractor may be reimbursed per Document 00 72 00 Article 7 for the coring cost if test results on the core samples indicate that the placed concrete meets the specification, and if it can be demonstrated that the original concrete cylinder samples were properly obtained.

F. Concrete Mix:

1. The design of the concrete mixtures shall be the responsibility of the Contractor, and shall be subject to review and approval by the Engineer.
 - a. Concrete mix shall be designed, in accordance with ACI 318, Chapter 26, by an approved independent testing laboratory, employed by the Contractor,

and the design submittal shall be signed by a California-registered Civil or Structural Engineer.

- 1) The testing laboratory shall submit certified copies of all laboratory trial mix reports to the Engineer.
 - 2) Do not place concrete prior to the Engineer's review of test reports and approval of mix design.
- b. Concrete shall be composed of a cementitious material, water, fine and coarse aggregates and admixtures.
 - c. The cementitious materials shall be Portland cement or Portland cement in combination with pozzolan.
 - d. The admixture shall be an air-entraining agent plus either a water reducing admixture or a water reducing retarding admixture as approved by the Engineer.
 - e. The proportions of all material used in the concrete shall conform to the approved mix design. Adjustments may be made to the batch weights or cement and water as necessary to maintain the water-cement ratio and the stipulated slump, with approval of the Engineer.
2. Minimum content of cementitious materials in structural concrete shall be as follows:

<u>Cementitious Material Used</u>	<u>Minimum Content in Pounds Per Cubic Yard of Concrete</u>
a. Portland cement only	602
b. Portland cement in combination with pozzolan	553 - cement, and 75 - pozzolan

3. Aggregate content: The nominal maximum size of aggregate used in structural concrete shall conform to the following requirements:

<u>Locations</u>	<u>Size</u>
a. Sections over 8 inches in thickness in which the clear distance between reinforcement is at least 2-1/4 inches.	1"x No. 4
b. Sections 8 inches or less in thickness or with a clear distance between reinforcement less than 2-1/4 inches.	3/4" x No. 4

Note: The nominal maximum size aggregate shall not be increased for these features, but may be decreased for sections requiring a special quality of concrete as directed by the Engineer.

4. Air Content:

- a. The air content by volume based on measurement made immediately after discharge from the mixer shall be determined by ASTM C231.
- b. The total calculated air content of the sample prepared in accordance with ASTM C231 shall be between 2% and 4%.

G. Quality Control:

1. Batch plant shall be approved by the Engineer in advance of use for this work.

1.3 SUBMITTALS

A. Submit concrete mix design to the Engineer for approval.

B. Representative samples of materials required for testing under this section shall be submitted to the EBMUD Materials Testing Laboratory, 1100 21st Street, Oakland. A minimum of one day in advance, make an appointment for the sample delivery by calling the laboratory at (510) 287-1990 between 8:00 a.m. and 10:00 a.m.

1. Complete a submittal log similar to the Concrete Data Sheet shown in Appendix A. A Microsoft Word electronic version of the Concrete Data Sheet template will be made available upon request.

C. Portland Cement:

1. Submit manufacturer's certificate of compliance with ASTM C150 and standard physical and chemical analysis.

D. Pozzolan:

1. Furnish with each shipment a certificate with test data showing compliance with ASTM C618.

E. Admixtures:

1. Submit 10-ounce sample of each product proposed for use in concrete mix if requested.
2. Submit with sample the manufacturer's test data showing performance of product in concrete as to air content, water reduction, retardation, and effect on concrete strength at various ages, for concrete temperatures ranging 50 degrees F to 90 degrees F.

F. Aggregates:

1. Submit for the Engineer's approval, two weeks in advance of the concrete work, a representative sample of each size of fine and coarse aggregate to be used. Size of each sample shall be not less than 50 pounds.

G. Bonding agents:

1. Submit the product information and the manufacturer's recommendations for the product application for the Engineer's approval prior to use.

1.4 PRODUCT DELIVERY AND STORAGE

- A. Ship cement in paper sacks or in bulk.
- B. Store cement, pozzolan, aggregates and admixtures so that they are protected against deterioration from any cause.
- C. Keep separate the several sizes of fine and coarse aggregate while in storage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All structural concrete shall have a minimum compressive strength of 4000 psi at 28 days.
- B. Portland Cement:
 1. Portland cement shall conform to ASTM C150, Type II, and shall not contain more than 0.60% by weight of alkalis (calculated as sodium oxide plus 0.658 potassium oxide). Tested and certified cement shall not be mixed with, nor contaminated by, any other cement.

C. Pozzolan:

1. Pozzolan for cement replacement shall conform to ASTM C618 Class N or Class F (fly ash) with the following exception:
 - a. Pozzolanic activity index with lime, at 7 days, shall be 1000 psi minimum. (Table 2, ASTM C618)

D. Admixtures:

1. Types:
 - a. Air entraining admixtures (AEA) shall conform to ASTM C260.
 - b. Water reducing admixtures and water reducing and retarding admixtures (WRA and WRRR) shall conform to ASTM C494, Type A and D.
 - c. Accelerating admixtures containing chlorides shall not be used.
2. Preparation:
 - a. Prepare admixtures in solution, maintain at uniform strength as recommended by the manufacturer, batch accurately by means of a reliable mechanical dispenser and visible check gauge, and add to the batch in the mixing water.
3. Specified admixtures:
 - a. Contractor shall add approved admixtures to all concrete. If requested, the Contractor shall submit a sample for testing as specified in Article 1.3.
4. Costs:
 - a. Include cost for furnishing and adding air entraining agent or other specified admixture to the concrete in the Contractor's bid for the work, and no extra compensation will be allowed thereafter.
 - b. Payment for furnishing and adding admixtures ordered by the Engineer but not covered by these specifications will be made as extra work as provided in the General Conditions.
 - c. The Contractor shall pay the cost of any admixture damaged, wasted, or used in unspecified concrete.

E. Water:

1. Water for mixing and curing concrete, washing aggregates, and mixing mortar shall conform to the requirements of CSS 90 - 1.02.D.

F. Aggregates:

1. Fine Aggregate (100% passing 3/8" mesh)

a. Conform to ASTM C33 with the following exceptions:

When tested in accordance with ASTM C136, fine aggregate shall conform to the following limits:

<u>Sieve Number</u>	<u>% by Weight Retained on Sieve</u>
4	0 – 6
8	5 – 22
16	10 – 27
30	15 – 28
50	15 – 27
100	12 – 20
200	0 – 7
Pan	0 – 3

Fineness modulus shall be not less than 2.50, nor more than 3.00.

Specific gravity S.S.D. shall not be less than 2.60.

- b. Free water shall not vary more than 5% in consecutive batches.
- c. Fine aggregate conforming to CSS Section 90-3.03 is also acceptable.

2. Coarse Aggregate (No. 4 to 1")

a. Conform to ASTM C33 with the following exceptions:

- 1) When tested in accordance with ASTM C136, coarse aggregate shall conform to following limits designated by the Engineer:

<u>Sieve Size</u>	<u>Percent by Weight Passing</u>	
	<u>Primary Aggregate Nominal Sizes</u>	
	<u>1" x #4</u>	<u>3/4" x #4</u>
1-1/2'	100	-
1"	88 – 100	100
3/4"	65 – 90	90 – 100
3/8'	15 – 35	15 – 40
No. 4	0 – 5	0 – 5

- 2) Cleanness Test: Samples from the batching bin shall have a cleanness value of not less than 75 (State of California, Division of Highways, Test Method No. Calif. 227).
 - b. Coarse aggregate (1" x No. 4) conforming to CSS Section 90-3.02 is acceptable for Location a. only. See Article 1.2 F - Concrete Mix.
 3. Wetting of Aggregate:
 - a. Perform wetting of aggregate for cooling, or rewashing to provide clean aggregate, in advance of delivery into the batching plant bins. Material shall have uniform and stable moisture content as batched, and such that the variations in aggregate moisture will not cause variations in slump from batch to batch of more than 1/2 inch. Any added moisture shall be in accordance with the water cement ratio specified in the approved mix design.
- G. Synthetic Fiber Reinforcing Material:
 1. Reinforcing material shall be 100% virgin polypropylene fibrillated fibers containing no reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement. Material shall conform to ASTM C1116, Type III, and Performance Level I, Toughness Index I₅, as outlined in Section 21 (Note 17) of ASTM C1116.
 2. Acceptable manufacturers:
 - a. Fibermesh Company, Vallejo, CA, (707) 642-7747
 - b. Or equal as approved by the Engineer.
- H. Bond breaker: Non-staining type, providing positive bond prevention.
 1. Manufacturers and products:
 - a. Williams Distributors, Inc., Seattle, WA; Williams Tilt-Up Compound
 - b. SCA Construction Supply Div., Superior Concrete Accessories, Franklin Park, IL; Silcoseal 77
 - c. Burke Co., San Mateo, CA; Burke Clean Lift Bond Breaker or Burke Tilt Free Bond Breaker
 - d. Or equal as approved by the Engineer.
- I. Patching material:
 1. Contain no chlorides or other chemicals causing steel corrosion.

2. Low pressure silica fume mortar, EMACO as manufactured by Master Builders, Co, or equal as approved by the Engineer

2.2 SPECIAL CONCRETE

- A. Concrete for curbs, gutters, sidewalks and driveways shall contain one pound of lamp black per cubic yard or its equivalent in approved liquid solution.

PART 3 - EXECUTION

3.1 PREPARATIONS PRIOR TO PLACING CONCRETE

- A. Remove standing water, mud, and debris from foundation surfaces.
- B. Clean reinforcement of loose mill and rust scale, mortar, oil, dirt and coatings that reduce bond.
- C. See Section 03 11 00 regarding treatment of forms.
- D. Approximately 30 minutes before concrete is placed, saturate wood forms and absorptive foundations with water.

3.2 BATCHING

- A. General:
 1. Provide and maintain means and equipment required to determine and control the relative amounts of the various materials, including water, cement, admixture, sand, and each individual size of coarse aggregate entering the concrete.
 - a. Proportion batches of concrete on the basis of integral sacks of cement unless the cement is weighed.
 - b. Determine amounts of sand and individual size of coarse aggregate entering each batch of concrete by weighing, and the water by either weighing or metering.
 2. Deposit materials in the batch bins directly over the discharge gates. Coarse aggregate shall be deposited in the batch bins through effective rock ladders when the free drop exceeds four feet.
 3. Construct, maintain and operate equipment for conveying batch materials from the weighing and batching hoppers so that there will be no spillage of the batched materials or overlapping of batches.
 4. The Engineer may inspect the batching operations at any time.

5. The Engineer may reject any concrete that is produced by batching equipment or operations that do not meet the requirements of the specifications.
6. Contractor shall give the Engineer 24 hours advance notice when batching is to be done.
7. Provide sufficient trucks of adequate size to ensure continuous delivery of batched material. Each truck shall carry a delivery ticket showing the mix number, size of batch, and the time it was batched. The ticket shall show the reading of the revolution counter at the time the truck mixer was charged.

B. Weighing and metering equipment:

1. Weighing and metering equipment shall be sealed by the California State Division of Weights and Measures.
2. Construct and operate batching equipment so that when the entire plant is running the combined inaccuracies in feeding and measuring materials will not exceed 1 percent for water or cement and pozzolan, 1 percent for any size of aggregate, and 1-1/2 percent for the total aggregate in any batch.
 - a. Equipment for convenient confirmation of the accuracy of measurement is required for each batch.
 - b. Equipment for water measuring shall be such that leakage will not occur when the valves are closed.
3. Provide standard test weights and other auxiliary equipment required for checking the operating performance of each scale or meter and make periodic tests in the presence of the Engineer. Furnish the Engineer with results of check tests made, and make adjustments, repairs, or replacements as the Engineer may consider necessary to secure satisfactory performance.
4. Where the batching plant involves the use of storage bins and weighing hoppers, each weighing unit shall include a visible springless dial or equal suitable device as approved by the Engineer which will register the scale load at any stage of the weighing operation from zero to full capacity.
 - a. Construct weighing hoppers so as to permit the convenient removal of material in excess of prescribed tolerances.
 - b. Each dial and water-measuring device shall be in full view of the operator, and, if practicable, the weighing equipment shall be arranged so that the operator may conveniently observe the operation of the bin gates and also the materials discharged into the mixing hopper.

5. Interlocked equipment

a. Interlock batching equipment in automatic plants so that:

A new weighing cycle cannot be started until all the batchers are completely emptied and the dispatcher discharger gates and valves are closed.

The batcher discharge gate cannot be opened until the correct weights of the materials are in the batching hoppers and the scales in balance.

The discharge gates cannot be closed until all materials are entirely discharged from the hopper and are back in balance.

b. Interlock water valve so that batcher discharge valve cannot be opened until the filling valve is closed.

c. Interlock admixture dispenser to operate with the water batcher.

6. Dispensers for air admixtures shall have sufficient capacity to measure at one time the full quantity of properly prepared solution required for each batch.

a. Unless these admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow uniformly into the water stream for the batch, from beginning to the end of its flow into the mixer.

b. Air entraining agents and water reducing retarders shall not vary from the required dosage more than five (5) percent.

3.3 MIXING AND DELIVERING

A. Ready-mixed concrete shall be mixed and delivered to the site of the work by means of one of the following operations:

1. Central mixed concrete: Mix completely in a stationary mixer. Transport the mixed concrete to the point of delivery in truck agitators or truck mixers operating at agitating speed. Non-agitating hauling equipment will not be permitted.
2. Shrink-mixed concrete: Mix partially in a stationary mixer and complete the mixing in a truck mixer.
3. Transit-mixed concrete: Mix completely in a truck mixer.

B. Mixing shall be in accordance with the following requirements:

1. Mix concrete ingredients in batch mixers until homogeneous and of uniform consistency.
 - a. The mixing of each batch shall continue for not less than 1-1/2 minutes for concrete not containing pozzolan, and for not less than 2 minutes for concrete containing pozzolan along with all ingredients, except the full amount of water, in the mixer.
 - 1) Minimum mixing period specified is predicated on the manufacturer's recommended speed of rotation of the mixer and the introduction of the materials, including water, into the mixer in accordance with ACI Standard 304, paragraph 4.3.
 - b. District reserves the right to increase the mixing time when the charging and mixing operations fail to result in the required uniformity of composition and consistency within the batch, and from batch to batch.
 - c. Add water prior to, during, and following the mixer-charging operations. No additional water shall be added to the batch to preserve the required concrete consistency despite excessive over-mixing.
 - d. Reduce batch sizes for ready-mixed concrete as necessary to avoid excessive mixing, loss of slump, and standby time.

C. Mixers and agitators:

1. Mixers may be stationary mixers or truck mixers.
2. Each mixer and its operation shall be subject to the approval of the Engineer, and any mixer that at any time produces unsatisfactory results, in the opinion of the Engineer, shall be repaired promptly and satisfactorily or shall be replaced.
3. Operate mixers and agitators within the limits of capacity and speed of rotation designated by the manufacturer of the equipment.
4. Equip each mixer other than truck mixers with a satisfactory mechanically operated timing and signaling (or locking) and metering device for indicating and assuring the completion of the required mixing period and for counting the batches.
5. Equip truck mixers with counters of the continuous-registering, non-resettable type which accurately measure the number of revolutions of the drum or blades. Mount counters where the Engineer may safely and conveniently inspect them from alongside the trucks.

- D. When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements of transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing at a central plant.
- E. When transit-mixed concrete is furnished, each batch of concrete shall be mixed for not less than 70 nor more than 100 revolutions of the drum or blades. The mixing speed shall be at the rate of rotation designated by the equipment manufacturer.
 - 1. Additional mixing shall be at the speed designated by the equipment manufacturer as agitating speed.
 - 2. All materials, including water, shall be in the mixer drum before starting the count of the number of revolutions of mixing.
 - 3. Mixing operations shall begin within 30 minutes after the cement has been intermingled with the aggregates.
- F. When a truck mixer or agitator is used for transporting concrete, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or before the drum has completed 300 revolutions, whichever comes first, after introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.
 - 1. The Engineer will consider waiving the above limitations if it can be demonstrated to his satisfaction that the concrete workability is such that it can be satisfactorily placed and finished without the addition of water.
 - 2. When truck mixer or agitator arrives at the job site, the concrete shall be observed for slump. If the slump exceeds that permitted in the specification, the concrete will be rejected. If the slump is less than specified, water may be added at this time, and at this time only, to obtain the slump permitted.
 - 3. The Contractor will remain responsible for the concrete strength regardless of if above adjustments have been made.
- G. No rejected concrete, the defects of which have been subsequently corrected, shall be used in the work unless approval has been given by the Engineer.

3.4 CONVEYING

- A. The methods and equipment used for conveying or transporting concrete shall maintain the concrete's required composition and consistency without segregation or loss of slump.
 - 1. Extensive shifting of the mass of fresh concrete by vibrating will not be permitted.
 - 2. Use elephant trunks or adjustable pipe if fall is more than 6 feet.

3. Conveyor belts shall not segregate concrete or spill mortar.
4. Concrete pumps shall be capable of pumping concrete without an increase in slump or decrease in aggregate size. Air slugger used with a concrete pump shall be as recommended by the pump manufacturer, and shall be kept to a minimum.
5. Aluminum pipe for conveying concrete is prohibited.
6. Chutes:
 - a. Use only for small isolated sections of the work with the permission of the Engineer.
 - b. Water to promote free flow of concrete in chutes will not be permitted.

3.5 PLACING

A. General:

1. Place concrete in the presence of the Engineer.
2. Concrete in each integral part shall be placed continuously. Contractor will not be permitted to commence work on any part unless his facilities and his forces on hand are sufficient to complete the placing and finishing of the concrete.
3. Concrete shall not be deposited over reinforcement, conduit, or piping until the Engineer has inspected the placing and given permission to proceed.
4. Place concrete while fresh before it has taken initial set. Concrete that has partially hardened shall not be retempered with additional water.
5. Place concrete in continuous, approximately horizontal layers; depths shall not exceed 24 inches. Build layers of concrete with square ends and level tops.

B. Rain:

1. Do not place concrete in the rain unless the concrete is protected from the addition of extra water.
2. Equipment and materials needed for rain protection shall be immediately available during concrete placement.

C. Temperature:

1. General:
 - a. Fresh concrete when placed shall have a temperature of not more than 80 degrees F and not less than 50 degrees F.

2. Cold weather concrete:

- a. Protect newly placed concrete against freezing.
- b. Remove ice, snow, and frost from placement area, before concrete is placed. Concrete shall not be placed on a frozen subgrade.
- c. Provide all necessary materials and equipment for the protection of newly placed concrete.
- d. When the mean daily temperature is predicted to drop below 40 degrees F, the concrete shall be maintained at a temperature above 50 degrees F for not less than 72 hours after it is placed. Protect formed concrete or slab surfaces with commercial insulating blankets not less than 1" in thickness.

D. Foundations:

1. Concrete in foundations shall be placed on original and undisturbed material unless otherwise shown on the drawings or unless required excavation prevents utilization of such foundation.
2. Provide and maintain pumping equipment to keep excavations free of water while concrete is being placed and for such time afterward to permit proper protection of the concrete during curing.
3. Intercept and remove water so there will be no flow into or through the freshly placed concrete.

E. Monolithically Placed Concrete:

1. If concrete is placed monolithically around openings having vertical dimensions greater than two feet, or if concrete in decks, slabs, girders, and other similar parts of structures is placed monolithically with supporting concrete, the following instructions shall be followed:
 - a. Place concrete over openings and in decks, slabs, beams, girders, and other similar parts of structures with as low a slump as practicable. Special care shall be exercised to achieve thorough consolidation.
 - b. Delay placing concrete from one to three hours at the top of openings and the bottom of decks, slabs, beams, girders, and other similar parts of structures; placing shall not be delayed so long that vibrating unit will not readily penetrate, by its own weight, the concrete placed before the delay.
 - c. Place last two feet or more of supporting concrete with as low a slump as practicable. Exercise special care to achieve thorough consolidation.

- d. Surfaces of concrete where delays are made shall be clean and free of loose and foreign material when concrete placing is resumed.

F. Placing concrete under water:

1. Place concrete under water by means of a tremie.
 - a. Exclude air and water from the pipe by keeping it constantly filled with concrete.
 - b. Keep the lower end of the tremie buried in the concrete as discharge takes place until the structure or lift is completed.
 - c. To prevent segregation, concrete shall be placed in a compact mass and not be vibrated nor disturbed after being deposited. Water shall be maintained in a still condition at the point of deposit.

3.6 CONSOLIDATING

- A. Consolidate concrete by means of high frequency internal vibrators with operating speeds of not less than 7,000 vpm, except under water.
- B. Employ ample number of vibrators to consolidate the incoming concrete to the proper degree within five minutes after it is deposited.
 1. Number of vibrators will be predicated on the nature of the job and the ability to sufficiently consolidate the concrete within the specified time.
 2. In general, the number of vibrators available for use at the forms shall be as follows:
 - a. One vibrator for each five cubic yards of concrete placed per hour, and one standby vibrator for each three (or portion of three) vibrators in service.
 - b. Two vibrators in good working order shall be present at the forms.
- C. Provide a reliable source of power for vibrators.

3.7 JOINTS IN CONCRETE

- A. Joints in concrete work shall be made only where indicated on the drawings or where approved by the Engineer.
- B. Screeds shall be securely set for horizontal joints in concrete work, and for the tops of walls. See Section 03 35 00.

- C. When concrete is placed against previously hardened concrete, the interface shall be clean, free of laitance, and intentionally roughened to a full amplitude of approximately 1/4-inch.
- D. Where concrete has set, see Article 3.8.

3.8 PACKING CONE HOLES AND REPAIRING CONCRETE IMPERFECTIONS

- A. After forms have been removed, make form tie holes watertight by roughening and moistening the surface and dry packing with a mixture of one part cement to three parts concrete sand.
 - 1. Resulting surface shall be finished to blend with the surrounding concrete.
 - 2. Cure repairs in accordance with Section 03 39 00.
- B. Repair rock pockets, honeycomb, mortar leaks, and other imperfections which require concrete or mortar replacement in accordance with Chapter VII of the Bureau of Reclamation Concrete Manual.
 - 1. Method and manner of making repairs shall be as approved by the Engineer and performed in his presence.
- C. Irregularities in concrete shall be repaired by bush hammering and grinding or building up as directed.
- D. Certain surface imperfections and irregularities may be left unrepaired when in the Engineer's judgment, they do not affect the structural integrity or soundness of the concrete and their repair would detract from the appearance of the structure.
- E. Use an approved bonding agent to assure a bond of the repair material to the old concrete. Apply according to the manufacturer's recommendation.

3.9 PACKING EQUIPMENT SUPPORT BASES

- A. Dry pack under the equipment support bases using a mortar mixture consisting of one part cement to three parts of concrete sand.
- B. Finish the resulting surface smooth at approximate one to one slope.
- C. Cure in accordance with Section 03 39 00.

3.10 FIELD QUALITY CONTROL

- A. Responsibility for testing: See Article 1.2.

B. Compressive strength tests

1. Provide such facilities and equipment as are necessary to procure and handle representative samples of concrete, and to safeguard test cylinders stored at the site of the work.

C. Slump tests

1. The slump determined by the Engineer in accordance with ASTM C143 at the point of placement shall not exceed the following:
 - a. Structures, flat slabs, and where not specified: 3 inches
 - b. Walls: 4 inches
2. Tolerance
 - a. Slump tolerance shall be plus or minus 1/2-inch.

END OF SECTION

SECTION 03 35 00
CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Finish formed and unformed surfaces of concrete.

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 FINISHING UNFORMED SURFACES

A. General:

1. Surfaces shall contain just sufficient mortar to avoid the necessity for excessive floating.
2. Working of the surface in the various finishing operations shall be the minimum necessary to produce the desired finish.
3. Prevent the addition of water from rain or other sources to surfaces being finished.
4. Do not use finishing tools in areas where water has accumulated. Delay operations on such areas until the water has been absorbed, evaporated, or removed by draining, mopping, dragging off with a loop of hose, or other means.
5. Unformed surfaces which will be exposed to the weather, and which would normally be horizontal, shall be sloped for drainage. Narrow surfaces such as the tops of walls and curbs shall be sloped approximately 3/8-inch per foot of width. Broad surfaces, such as walks, roadways, platforms, and decks, shall be sloped approximately 1/4-inch per foot.

B. Finish U-S (unformed, screeded):

1. Use on pipe anchors and pavement repair.
2. Finishing operations consist of leveling and screeding the concrete to produce an even, uniform surface.
 - a. Remove surplus concrete after consolidation by striking it off with a sawing motion of the straightedge or template across wood or metal strips that have been set as guides.

C. Finish U-F (unformed, float finish):

1. Use on structures covered by backfill. May be done by hand or power-driven equipment
 2. Do not start floating until some stiffening has taken place in the surface concrete and the moisture film or “shine” has disappeared.
 3. Float the concrete no more than necessary to produce a surface that is uniform in texture and free of screed marks. Light surface pitting is not objectionable.
 4. If a troweled finish is to be applied, the floating shall leave a small amount of mortar without excess water at the surface to permit effective troweling.
 5. Cut and fill shall be done during the floating operations.
 6. Finish joints and edges with edging tools unless formed chamfers are indicated on the drawings.
 7. Hairline cracks are usually the result of a concentration of water and fines at the surface caused by over-manipulation during finishing operations. Cracking is aggravated by untimely finishing and by too rapid drying and cooling.
 - a. If low humidity may cause checking, keep surface moist temporarily with a very fine spray of water. Apply so as not to wash the surface nor form pools on it.
 - b. Checking that develops prior to troweling shall be closed by pounding the concrete with a hand float.
 - c. Water used for preliminary moistening shall be no colder (preferably warmer) than the concrete.
 8. Flat surfaces with a U-F finish shall be plane within a tolerance of 1/4-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.
- D. Finish U-F2 (unformed, float finish after concrete partially hardened):
1. Use on unformed surfaces, unless otherwise specified.
- E. Finish U-FB (unformed, broom finish):
1. Use where a non-skid surface is required.
 2. Scored by brooming with a steel wire or stiff coarse-fiber broom before the concrete has hardened thoroughly.
- F. Finish U-T (unformed, troweled):

1. Use where smoothness is essential, such as foundation ring for tank walls and inverts of hydraulic structures.
2. Steel trowel after the moisture film and “shine” have disappeared from the floated surface and after the concrete has hardened enough to prevent an excess of fine material and water from being worked into the surface. Avoid excessive troweling. Perform with a firm pressure that will flatten and smooth the sandy surface left by the floating. Produce a dense uniform surface free of blemishes, ripples, and trowel marks.
3. The floating shall leave a small amount of mortar without excess water at the surface to permit effective troweling.
4. Obtain a fine textured surface that is not slick by applying a “sweat” or light “scroll” finish immediately after the first regular troweling. Trowel lightly over the surface with a circular motion, keeping the trowel flat on the surface of the concrete.
5. Flat surfaces with a U-T finish shall be plane to within a tolerance of one-eighth inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

G. Finish U-TB (unformed, troweled, hair brush finish):

1. Use on sidewalks and other concrete surfaces subject to foot traffic. May be used on inverts of hydraulic structures when a non-skid surface is needed.
2. After floating and troweling and before concrete has hardened, score by brooming with a hair brush to produce a fine texture.

3.2 FINISHING FORMED SURFACES

A. General:

1. Fill form tie depressions and repair imperfections as specified in Section 03 30 00.
2. Repair surface irregularities as required for each finish.
 - a. “Abrupt” irregularities are offsets and fins caused by displaced or misplaced form sheathing, lining, or form sections, or by otherwise defective formwork.
 - b. All other irregularities are classed as “gradual” and will be measured with a 5-foot template consisting of a straightedge for plane surfaces or its equivalent for curved surfaces.

B. Finish F-1 (formed, rough):

1. Use on surfaces upon or against which backfill or concrete will be placed, or which will be permanently concealed.
 - a. Form sheathing may be anything that will not leak mortar when the concrete is vibrated.
 - b. Repair surface depressions greater than one inch.
- C. Finish F-2 (formed, smooth):
 1. Use on exposed surfaces where a specific formed finish is not shown on the drawings.
 - a. Repair all conspicuous offsets and bulges and all surface irregularities exceeding 1/2-inch gradual and 1/4-inch abrupt.
 - b. Filling of air holes smaller than 1/2 inch, and sack rubbing are not required.
- D. Finish F-3 (formed, very smooth):
 1. Use on superstructures of buildings, control and hydraulic structures, parapet walls, and railings.
 - a. Repair all visible offsets, bulges, misalignment, and all surface irregularities exceeding 1/4-inch gradual and 1/8-inch abrupt.
 - b. Sack rub air holes 1/8-inch and larger.

END OF SECTION

SECTION 03 39 00
CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Cure and protect all freshly placed concrete in accordance with this section.
- B. Related sections:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 03 11 00 – Concrete Forming
 - 3. Section 03 20 00 – Concrete Reinforcing
 - 4. Section 03 30 00 – Cast-in-Place Concrete
 - 5. Section 03 35 00 – Concrete Finishing

1.2 SUBMITTALS

- A. Submit curing compound product literature and application instructions a minimum of 30 days prior to use.
- B. Submit method and materials to be used for water curing a minimum of 30 days prior to use.

1.3 PRODUCT HANDLING, STORAGE AND DELIVERY

- A. Deliver materials in manufacturer's original, unopened containers with labels intact and legible.
- B. Deliver materials in sufficient quantity to allow continuity of work.

PART 2 - PRODUCTS

2.1 WATER

- A. Water used for curing concrete shall be potable. See Section 01 50 00.

2.2 CURING COMPOUNDS

A. Applications for potable water facilities

1. Curing compound shall be water-based, clear, and odor less conforming to ASTM C309, Type 1-D, and certified per NSF 61.
2. Acceptable products
 - a. Quantum-Cure 61, Atlas Construction Supply Inc.
 - b. Or equal as approved by the Engineer

B. Applications for non-potable water facilities

1. Curing compound shall be resin-based, clear, conforming to ASTM C309, Type 1-D.
2. Acceptable products:
 - a. Burke Aqua Resin Cure (clear), Edoco by Dayton Superior
 - b. 1100-Clear, W. R. Meadows
 - c. Or equal as approved by the Engineer

2.3 CURING BLANKETS

- ### A.
- Shall be an absorptive mat or layers of fabric weighing a minimum of 12 ounces per square yard when dry

PART 3 - EXECUTION

3.1 GENERAL

- ### A.
- Keep wood forms wet at all times until removed or for 14 days, whichever comes first, to prevent the opening of joints and drying out of the concrete.
1. Provide at least 350 degree days of curing (50 degrees times 7 days of 24 hours each).
 2. If hourly temperatures at any surface of a concrete placement drop below 50 degrees Fahrenheit during the curing period, count the period below 50 degrees Fahrenheit as zero degrees, and extend the curing time to compensate.
- ### B.
- Coordinate repairs or treatment of concrete surfaces so that no interruption of the curing, except for very short periods of time, will be necessary.
- ### C.
- Any surface that is to receive liquid-applied waterproofing shall be water-cured only.

3.2 WATER CURING

- A. Keep concrete continuously wet for a minimum period of 14 days.
 - 1. Each day forms remain in place will be counted as 1 day of water curing.
 - 2. Do not loosen form ties during period when concrete is cured by leaving forms in place. No further curing credit will be allowed for forms remaining in place after contact has been broken between concrete surface and forms.
- B. Begin water curing as soon as concrete attains initial set.
- C. Maintain a wet surface by ponding, continuous sprinkling, covering with saturated burlap, or otherwise maintaining free water visible on the surface by means acceptable to Engineer:
 - 1. Flood top of walls with water at least 3 times per day, and keep surfaces moist at all times during 14 day curing period.
 - 2. Provide plastic sheet material over surfaces if required to maintain a wet surface during arid or windy conditions. See plastic membrane curing requirements for additional details.
- D. Use water having a temperature within 20 degrees Fahrenheit of the temperature of concrete, and not lower than the minimum temperature allowed for the concrete surface during curing.

3.3 PLASTIC MEMBRANE CURING

- A. Install plastic membrane as soon as concrete is finished, and can support limited pedestrian traffic without damage.
- B. Cover entire surface of finished concrete with membrane.
- C. Anchor membrane to prevent uplift from wind or air trapped below the sheet.
- D. Fully seal joints and edges to provide full seal around perimeter.
- E. Keep concrete under plastic membrane moist, regularly monitoring surfaces and adding supplemental moisture if necessary. Add water as specified for water curing.

3.4 CURING COMPOUND

- A. Apply curing compound to concrete surface after repairing and patching, and within 1 hour after forms are removed:
 - 1. If more than 1 hour elapses after removal of forms, do not use membrane curing compound. Instead, provide water curing for not less than 14 days.

2. Do not remove sprayed membrane curing compound from concrete in less than 14 days after initial application.
 3. When application of curing compound at concrete joints is accepted by Engineer, take care to apply curing compound to all surfaces along full profile of joints.
- B. Apply curing compound by mechanical, power operated sprayer with mechanical agitator that will uniformly mix all pigment and compound:
1. Apply curing compound in at least 2 coats.
 2. Apply each coat in direction turned 90 degrees from application direction of the preceding coat.
 3. Apply curing compound in sufficient quantity so that concrete has uniform appearance, and its natural color is effectively and completely concealed at time of spraying.
 4. Continue to coat and recoat surfaces until specified coverage is achieved and until coating film remains on concrete surfaces.
- C. Thickness and coverage of curing compound:
1. Provide curing compound having film thickness that can be scraped from surfaces at any and all points after drying for at least 24 hours.
 2. The Contractor is cautioned that method of applying curing compound specified in this Section may require more curing compound than normally suggested by manufacturer of curing compound, and is more than is customary in the trade. Apply amounts specified in this Section, regardless of manufacturer's recommendations or customary practice.
- D. If Contractor desires to use a curing compound other than specified product, coat sample areas of concrete wall with proposed curing compound, and also coat similar adjacent area with the specified compound in the manner specified, for comparison:
1. If proposed sample is not equal or better, in opinion of the Engineer, the proposed substitution will not be allowed.
- E. Removal of curing compound:
1. After curing period is complete, remove curing compound placed on surfaces that will receive additional concrete, including all concrete joint surfaces, by abrasive blasting or by other means acceptable to Engineer. Complete removal and cleanup prior to placing any new concrete against the surface.
 2. Where additional finishes will be applied over concrete surfaces, unless otherwise recommended by the manufacturer of the finish to be applied, remove curing

compound by sandblasting. Provide blasting as necessary to fully remove curing compound.

- F. Prior to final acceptance of the work, remove, by sandblasting or by other method acceptable to the Engineer, any curing compound on surfaces exposed to process water or exposed to view, so that only natural color of finished concrete is visible and uniform over the entire surface.

3.5 SCHEDULE OF CURING METHODS

- A. Cure the following concrete surfaces using water curing:

1. Floor surfaces of water containment structures.
2. Surfaces where additional concrete will be placed over or against the surface, including concrete joints.
3. Surfaces where grout or other toppings will be placed over the surface.
4. Slabs scheduled to receive concrete sealer, or other bonded or adhered architectural finishes.
5. Formed surfaces scheduled to receive coatings, paint, adhered masonry, cementitious materials, liquid-applied waterproofing, or other similar finishes, and where formwork is removed within 7 days after concrete placement.
6. Horizontal concrete surfaces at tops of walls.

- B. Cure the following concrete surfaces by water curing, plastic membrane curing, or sprayed curing membrane. Selection of methods shall be at the Contractor's option:

1. Surfaces not listed in the preceding paragraph.

END OF SECTION

SECTION 31 11 00 – SITE CLEARING

PART 1 GENERAL

1.01 SUMMARY

- A. The General Conditions and the Supplementary Conditions shall apply to all of the work of every Section or Subsection of these specifications as if fully repeated in each.
- B. Summary of work: Provide all material, labor and equipment necessary to complete all work as shown on the drawings and as specified herein, including, but not limited to, the following:
 - 1. Removal
 - 2. Salvage
 - 3. Clearing and grubbing
- C. Related Sections include the following:
 - 1. 01-35-43 Temporary Environmental Controls
 - 2. 31-20-00 Earthwork
 - 3. 31-23-19 Dewatering
 - 4. 32-90-00 Revegetation

1.02 REFERENCES

- A. BAAQMD – Bay Area Air Quality Management District
- B. Standard Specifications or State Standard Specifications – 2022 Standard specifications of the State of California, California State Transportation Agency, Department of Transportation, CALTRANS.

1.03 SUBMITTALS

- A. None.

1.04 QUALITY ASSURANCE

- A. Clearing, grubbing and vegetation removal shall be in accordance with the requirements of the California Department of Fish and Wildlife permit, the US Army Corps of Engineer permit, the Regional Water Quality Control Board Permit, and the WPCP.
- B. Comply with the following Standards: American National Standards Institute, Inc. "American National Standard Safety Requirements for Demolition" (ANSI A10.6 and A10.8).
- C. Regulatory Agencies:
 - 1. Comply with rules and regulations of State of California, California Administrative Code, Title 8, Industrial Relations, Chapter 4, Subchapter 4, "Construction Safety Order."
 - 2. Comply with applicable local and state agencies having jurisdiction.
 - 3. Comply with governing EPA notification regulations.
- D. Secure all required Permits or Certificates for demolition or discontinuance of utilities, prior to beginning the work.

1.05 PROJECT CONDITIONS**A. Project Work Window**

1. Only conduct ground-disturbing activities in the channel during the dry season, June 15 through October 31 (or as otherwise allowed by permits). No work shall be conducted outside of the 7 a.m.–7 p.m. window.
2. No work shall be conducted during or within 24-hours of a rain event (0.25 inches in a 24-hour period). Disposition of Existing Improvements:

B. Protection:

1. Erect and maintain temporary bracing, shoring, lights, barricades, except construction barricades for subsequent new construction, warning signs, and guards necessary to protect public, the Owner's employees, finishes, improvements to remain and adjoining properly from damage, all in accordance with applicable regulations.
2. Wet down areas affected by this work as required preventing dust and dirt from rising.

C. Scheduling:

1. Coordinate with Project Manager in scheduling noisy work.

D. Traffic Circulations: Ensure minimum interference with roads, streets, driveways, sidewalks, and adjacent facilities.

1. Do not close or obstruct public thoroughfares without first obtaining the required permit or permission of the responsible public jurisdiction.
2. Where closing of a vehicular or pedestrian traffic circulation route is necessary, provide adequate directional signs to minimize the potential for confusion.

1.06 REFERENCES

- A. Standard Specifications or State Standard Specifications – 2022 Standard specifications of the State of California, California State Transportation Agency, Department of Transportation, CALTRANS.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION****3.01 EXAMINATION****A. Examine areas affected by work of this Section and verify following:**

1. Disconnection of utilities as required.
- B. Where existing conditions conflict with representations of the Contract Documents, notify the Engineer and obtain clarifications. Do not perform work affecting the conflicting conditions until clarification of the conflict is received.

3.02 PREPARATION

- A. Verify that the area to be demolished or removed has been vacated, or adequate space made available to perform the work.
- B. Lay out cutting work at Job Site and coordinate with related work for which cutting is required.

3.03 REMOVAL

- A. If known or suspected hazardous materials are encountered during operations, stop operations immediately and notify the Engineer.
- B. Perform work in accordance with ANSI A10.6-1969 unless otherwise noted.
- C. Provide noise and dust abatement as required to prevent contamination of adjacent areas.
- D. Remove all materials not designated as salvage in their entirety.
- E. Removing AC Pavement
 - 1. Neatly saw cut AC pavement to a full depth where indicated on the plans. Confirm cut locations with EBMUD Project Manager prior to cutting.
 - 2. Dispose of AC and aggregate base attached to the HMA offsite and in a legal manner unless otherwise noted
- F. Trees removed from areas to be graded shall be removed to a minimum depth of 12 inches below existing or proposed or finish grades, whichever is lower, unless otherwise noted.

3.04 SALVAGE

- A. All items noted to be salvaged, or necessary to salvage to perform the work, shall be removed as carefully as possible by the Contractor so that a minimum amount of reconditioning will be required for reusing the items.
- B. It shall be the Contractor's option to provide and install new materials and equipment instead of reinstalling salvaged items.

3.05 CLEARING AND GRUBBING

- A. All cut and fill areas: Strip topsoil to 2-inches minimum below existing grade where vegetation occurs and as indicated in plans. Additional depth may be required to remove organic materials.
- B. Grub entire roots as required to remove entire root system and organic materials.
 - 1. Soil must be free of root fragments.
- C. Clear and grub as required by hand to protect items to be preserved and protected, including but not limited to utilities, trees, and fences.
 - 1. Where vegetation is interwoven into these items, carefully cut vegetation and remove material that can be easily separated, leaving in place vegetation that would damage the items to remain.
 - 2. Provide clean cuts at all vegetation to remain.
 - 3. Ensure plants to remain on protected items are severed from roots and all roots are completely removed.
- D. Stripped material shall be disposed of off-site at the direction of the EBMUD Project Manager and in a legal manner unless otherwise noted.

3.06 PREPARATION FOR NEW FINISH WORK

- A. Where demolished surfaces are scheduled to receive new finishes, Contractor shall restore such substrate to a condition ready to receive the scheduled new finishes, including grinding or leveling.

3.07 DISPOSAL OF MATERIALS

- A. Promptly dispose of demolished and cleared materials. Do not allow materials to accumulate on-site.
- B. Burning of materials off Owner's property in a legal manner.

3.08 CLEANING

- A. Upon completion of removal, clearing, and grubbing, areas shall be left in a neat, clean condition ready to receive subsequent work.
- B. Fill voids in the land left by Site Clearing work.
 - 1. Grade finished remaining surface to the contours shown, or if not shown, to match the pre-project existing natural contours. Where applicable, final grades should provide for positive drainage.

END OF SECTION 31 11 00 – SITE CLEARING

SECTION 31-20-00– EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Provide labor, material and equipment and services necessary to complete the excavations, recompaction, and finish grading as specified and indicated on Drawings.
 - 1. Provide Site Grading, cut, fill and finish.
 - 2. Provide excavation and backfill for filling construction.
 - 3. Preparation for subgrade for foundations, pavements, and landscaping.
 - 4. Provide sub-base course for foundations and pavements.
- B. Geotechnical Engineer refers to Owner or Owner's Representative (O.R.) for the project including the Authority Engineer, associates, or agents.

1.02 DEFINITIONS

- A. On-site Material: Soil or earth material obtained from required on-site excavation.
- B. Excavation: Consists of the removal of material encountered to subgrade elevations and the re-use or disposal of materials removed.
- C. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.
- D. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- E. Base Course: The layer placed between the sub-base and surface pavement in a paving system.
- F. Relative Compaction: In-place dry density of soil expressed as percentage of maximum dry density of same materials, as determined by laboratory test procedure American Society for Testing and Materials (ASTM) D1557.
- G. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below topsoil, rock base course, or drainage fill.

1.03 REQUIREMENTS

- A. Grades and elevations are to be established with reference to benchmarks referenced on Drawings.
- B. Maintain engineering markers such as monuments, benchmarks and location stakes. If disturbed or destroyed, replace.

1.04 SUBMITTALS

- A. All submittals in this specification package (excluding resubmittals) shall be compiled together and submitted to the O.R. as one package.
- B. Test Reports: Submit following reports for import material directly to Geotechnical Engineer from the Contractor's testing services:
 - 1. Test reports on borrow material.
 - 2. Density test reports.
 - 3. One optimum moisture-maximum density curve for each type of soil encountered.

1.05 QUALITY ASSURANCE

- A. Requirements of regulatory agencies:
 - 1. Comply with State of California Business and Transportation Agency, Department of Transportation (Caltrans) Standard Specifications. (C.D.T. Standard Specifications)
 - 2. Comply with State of California Code of Regulations (CCR).
 - 3. Comply with State of California Construction Safety Orders, Latest Edition (CAL/OSHA).
- B. Soil Testing:
 - 1. A geotechnical testing agency, to include testing soil materials proposed for use in the work and for quality control testing during excavation and fill operations. Test results will be distributed.
- C. Codes and Standards:
 - 1. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
 - 2. Water Pollution Control Plan.
- D. Source Quality Control
- E. Geotechnical Engineering Services:
 - 1. The Inspector of Record (I.O.R.) will be the Owner's Representative to observing grading observations during preparation offsite, excavation, and compactions of fill materials.
 - 2. Make visits to site to familiarize themselves generally with progress and quality of work.
 - 3. Make field observations and tests to enable them to form opinions regarding adequacy of site preparation, acceptability of fill materials and extent to which earthwork construction and relative compaction comply with specifications requirements.
 - 4. Examine conditions exposed in foundation excavations.
- F. Site Information:
 - 1. Additional soil borings and other exploratory operations may be made by Contractor at no cost to the Owner. Submit proposed boring locations for review prior to performing the work.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect materials of this section before, during and after installation; objects designated to be retained; and the installed work of other trades.
- B. In the event of damage to any of these items, immediately make repairs or replacements necessary to the acceptance of the Owner's Representative and at no additional cost to the Owner.
- C. Comply with requirements of the Water Pollution Control Plan necessary to control dust and noise on and near the work caused by operations during performance of the Work.

1.07 PROJECT CONDITIONS

- A. Site Information: Review Geotechnical Engineering Study (authored by Atlas Technical Consultants and dated 3/4/2025).

B. Environmental Requirements:

1. When unfavorable weather conditions necessitate interrupting filling and grading operations, prepare areas by compaction of surface and grading to avoid collection of water.
2. Provide adequate temporary drainage to prevent erosion.
3. After interruption, reestablish compaction specified in last layer before resuming work.
4. Protect creek from silt and debris resulting from construction activities using silt fencing along the perimeter of the project's limit of grading. If contamination occurs, remove contamination by pumping from the site to a designated upland area at no cost to the Owner.

C. Protection of Subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations, or other areas prepared for project.

D. Transport all excess soils materials by legally approved methods to disposal areas.

1. Coordinate with the Owner's Representative.
2. Sufficient topsoil and fill material shall be retained from the site to complete project requirements.
3. Any additional topsoil and fill requirements shall be the responsibility of the Contractor.

1.08 EXISTING UTILITIES

- A. Contact local utility agencies prior to construction. Coordinate with local utility companies and the Owner for shut-off of service lines.
- B. Locate existing underground utilities in the areas of work. If utilities are present within the limit of work and have potential to be impacted by earthwork activities, provide adequate means of protection during excavation operations.
- C. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Civil Engineer immediately for directions.
- D. Coordinate with public and private utility companies as needed in keeping their respective services and facilities in operation.
- E. Repair damaged utilities to the satisfaction of the Geotechnical Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:

1. During grading operations, soil types other than those analyzed in the Geotechnical Report for the project, may be encountered.
2. Consult the Geotechnical Engineer to determine the suitability of these soils.
3. Material shall be generated from below the stripped layer.
4. Soils obtained from on-site excavations, except for materials derived from the stripping operations, are suitable for reuse as fill material, provided that it meets the fill gradation criteria.

- B. Topsoil: Friable clay loam surface soil found in a depth of not less than 5 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2 inches in diameter, and without weeds, roots and other objectionable material.
 - 1. Topsoil may be used:
 - a. For the top 2 feet of fill in areas less than three horizontal to one vertical
 - b. Where noted on plans.
 - 2. Topsoil may not be used:
 - a. Under paving and sidewalks.
 - 3. Confirm suitability of stockpiled materials.
- C. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

PART 3 EXECUTION

3.01 GENERAL

- A. Contractor shall strip all areas to be filled and as indicated in plans. Refer to SECTION 31 11 00 SITE CLEARING for vegetation removal requirements.
- B. Proper moisture content of fill shall be maintained by adding water or dried by appropriate methods as required.
- C. Scarify top 6 inches of all areas to receive fill and re-compact to specified relative compaction.
- D. Contractor shall place fill in lifts not greater than 8-inches in uncompacted thickness, brought to proper moisture content, and compacted to the specified relative compaction.
- E. For locations where the fill slope is over five (5) feet high, an intermediate bench shall be excavated into the stripped surface, located at approximately mid-height of the slope. The bench shall be at least three (3) feet wide into competent material.
- F. All open excavations 5 feet or greater in depth shall be constructed with bracing, sheeting, shoring, or other equivalent method designed for the protection of life and limb in accordance to Section 6705 of the State Labor Code.
- G. The excavations and support system shall comply in all respects with the requirements of Article 6, of the Construction Safety Orders of the Division of Industrial Safety.

3.02 GRADING

- A. General: Uniformly grade areas of work including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grading Tolerances:
 - 1. Excavations shall not exceed 0.10-foot variation from dimensions and elevations shown or noted, unless otherwise approved by Civil Engineer.
 - 2. Fill and backfill shall be placed with tolerance of plus or minus 0.10 foot if placed in layers.
 - 3. Engineered streambed material (ESBM) shall be placed with tolerance of plus or minus 0.25 foot (3 inches).
 - 4. Riprap shall be placed with tolerance of plus or minus 0.25 foot (3 inches).

5. Grading shall be done within plus or minus 0.10 foot typically; areas under slabs, walks or pavements shall be graded within tolerance of 0 to 0.10 foot.
 6. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface below required subgrade elevation.
- C. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.
- 3.03 COMPACTING
- A. Compact by power tamping, rolling or combinations thereof as accepted by the Geotechnical Engineer.
1. Where impractical to use rollers, compact by mechanical tamping.
 2. Scarify and recompact any layer not attaining compaction until required density is obtained.
- B. Compaction by flooding, ponding or jetting will not be permitted.
- C. Minimum relative compactions shall be as follows, unless otherwise noted on the plans.
1. The top two (2) feet of soil placed below aggregate base rock or pavement shall be compacted to 95% relative compaction.
 2. Soil placed on slopes steeper than three horizontal to one vertical shall be compacted to 95% relative compaction.
 3. Soil placed in areas dedicated to new planting shall be compacted to 85% relative compaction.
 4. All other soil shall be compacted to 90% relative compaction.
- D. Concrete Work
1. Excavation for concrete work shall be carefully made, true to the grades and elevations shown on the plans. Excavations shall be kept free from standing water.
- 3.04 EXISTING UTILITIES
- A. Protect existing utilities that are to remain in operation.
- B. Movement of construction machinery and equipment over existing pipes and utilities during construction shall be at Contractors risk and all cost shall be borne by the Contractor for any damage of any underground utilities.
- C. Excavation made with power-driven equipment is not permitted within 2 feet of any known utility or subsurface structure.
1. Use hand or light equipment for excavating immediately adjacent to or for excavations exposing a utility or buried structure.
 2. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured.
 3. Support uncovered lines or other existing work affected by excavation until approval for backfill is obtained.
 4. Report damage of utility line or subsurface structures immediately to the Civil Engineer.

3.05 FIELD QUALITY CONTROL

- A. Site Tests: Relative compaction shall be determined by ASTM Test Method D1557. Field density test shall be performed with ASTM Test Designation D2922 and D3017 (Nuclear Probe Method).

SECTION 31-20-00– EARTHWORK

SECTION 31 62 16 – STRUCTURAL STEEL PILES

PART 1 -- GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall provide structural steel piles, complete and in place, in accordance with the Contract Documents.
- B. A geotechnical engineering study has been performed for the Site. The soil report is available at the ENGINEER's office. The CONTRACTOR shall understand and conform to recommendations and criteria associated with pile foundations given in that report.
- C. The information provided in the geotechnical engineering report is available assist the CONTRACTOR, at its own risk, in assessment of subsurface conditions at the Site.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM A36/A36M – Standard Specification for Carbon Structural Steel

ASTM A252 – Standard Specifications for Welded and Seamless Steel Pipe Piles

ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

ASTM A992/A992M – Standard Specification for Structural Steel Shapes

ASTM D 1143 Testing Piles Under Static Axial Compressive Load

1.3 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with Section 01 33 00 - Contractor Submittals.
- B. The CONTRACTOR shall furnish written notification to the ENGINEER of the scheduled date for commencing pile driving at least one week in advance of that date. At the same time the CONTRACTOR shall provide information including make, model, and rated driving energy for the pile driving hammer proposed for use, and details of collars, shoes, splices, cushion blocks, and related items. The CONTRACTOR shall also describe the method it proposes to use to test load the piles, if test loading is required.
- C. The CONTRACTOR shall submit within 2 Days, on a form approved by the ENGINEER, a driving record of each pile driven. The record shall include date and time of driving, pile location and number, pile dimensions, elevation of point, elevation of butt before and after cutoff, ground elevation, number of blows required for each foot of penetration, pile deviation, description of driving equipment used, and any unusual occurrences during pile driving.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Structural steel piles shall be of such quality that the finished piles can be handled and driven to required bearing without bending, cracking or other damage that would impair their strength or durability.
- B. The piles shall present true, smooth, even surfaces and shall be sufficiently straight that a line stretched from butt to tip along any face will not deviate nor be deflected therefrom more than 1-inch in 50-feet at any point. Defects in any pile may be accepted if repaired to the satisfaction of the ENGINEER.

2.2 ROLLED STRUCTURAL STEEL PILES

- A. Rolled structural steel piles shall conform to the following standard specifications:
 - 1. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium- Vanadium Structural Steel
- B. Steel for cast steel shoes, if used, shall conform to A148 (Grade 90-60).
- C. Rolled structural steel piles shall conform to the sizes and shapes shown in the contract documents.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Piles shall be accurately located and driven either vertically or to the prescribed batter as indicated. No variation greater than 1/4-inch per foot will be permitted. Piles with greater variation and those seriously damaged in driving shall be removed or cut off and replaced with new piles.
- B. Any pile heaved by the subsequent driving of adjacent piles shall be redriven. Piles, after driving, shall not be out of position by more than 6 inches. All correction costs are part of the WORK.
- C. After driving, the pile head shall be within 6 inches of plan locations for all piles capped below final grade.
- D. No pile shall be nearer than 4 inches from any edge of the cap. Any increase in pile cap dimensions or reinforcing caused by out-of-position piles shall be at the Contractor's expense.

3.2 HANDLING STEEL PILES

- A. Structural steel piles shall be lifted or supported in a fashion which does not damage the piles. Any pile that becomes damaged during shipping or handling will be rejected. Subject to the ENGINEER's approval, damage pile may be repaired by straightening or removing

the damaged portion of the pile, and welding on a new section. Rejected piles shall be removed and disposed of by the CONTRACTOR at its expense.

3.3 DRIVING EQUIPMENT

- A. Pile hammers shall be approved types that develop sufficient energy to drive the pile at a penetration rate of not less than 1/8-inch per blow at the required bearing value, and shall develop energy per blow at each full stroke of the piston of not less than 1 foot-pound for each pound of weight driven. Diesel and vibratory pile hammers may be used only when approved by the ENGINEER.
- B. Steam or air hammers shall be furnished with boiler or air capacity at least equal to that specified by the manufacturers of the hammers being used. The boiler or compressor shall be equipped with an accurate pressure gauge. The valve mechanism and other parts of steam or air hammers shall be maintained in first-class condition so that the length of stroke and number of blows per minute for which the hammer is designed can be continuously obtained.
- C. When necessary to obtain the required penetration, and with the approval of the ENGINEER, the CONTRACTOR may be required to supply and operate one or more water jets and pumps. The use of jets at locations where the stability of embankments or other improvements would be endangered will not be permitted. Jetting will not normally be permitted in cohesive soils. Jetting shall be suspended and the pile driven for the last 3-feet to required bearing.

3.4 DRILLED HOLES

- A. When approved by the ENGINEER, piles may be driven in predrilled holes. The holes shall have a diameter not greater than the diameter of the pile at ground surface. The depth of the predrilled hole shall be adjusted by the CONTRACTOR as WORK proceeds in order to maintain adequate bearing. Piles shall be driven sufficiently to secure full bearing. Minimum penetration of the pile below the bottom of the predrilled hole shall be 5-feet unless otherwise authorized by the ENGINEER.

3.5 DRIVING

- A. Piles being driven by impact shall be protected from damage by a properly fitted driving head, a capblock and pile cushion, designed for the driving conditions involved.

3.6 BEARING VALUE

- A. As a minimum, piles shall be driven to the penetration and bearing value indicated. The bearing value shall be determined from the applicable formula in the following schedule:
- B. For piles driven with a single acting steam or air hammer

$$P = \frac{2WL}{(s + 0.1)} \quad \text{or} \quad P = \frac{2E}{(s + 0.1)}$$

- C. For piles driven with a double acting steam or air hammer

$$P = \frac{2L(W + ap)}{(s + 0.1)} \quad \text{or} \quad P = \frac{2E}{(s + 0.1)}$$

P	=	Safe bearing load developed by the pile in pounds.
W	=	Weight of the hammer in pounds.
L	=	Length of stroke in feet.
s	=	Penetration of the pile into the ground per blow in inches taken as the average over the last 10 blows. Penetration shall be measured at a time when there is no appreciable rebound of the hammer and the preceding blow was struck upon a sound pile head or driving block.
a	=	Effective area of the piston in square inches.
p	=	Mean effective steam pressure in the case of steam hammers or mean effective air pressure in the case of air hammers, in psi.
E	=	Manufacturer's rating of energy developed by the hammer in foot-pounds.

D. The above formulas are applicable only when:

1. The head of the pile is not deformed.
2. The penetration of the pile is at a reasonably uniform rate.
3. The hammer used is non-vibratory and is being operated within the manufacturer's recommended ranges.

3.7 SPLICING OF PILES

- A. Where splices are unavoidable their number, locations and details shall be subject to approval of the Engineer.
- B. Full-length piles shall be used where practicable. If splicing is permitted, the method of splicing shall be according to AWS D1.1 or as approved by the Engineer. The arc method of welding shall be preferred when splicing steel piles. Only certified welders shall perform welding. Mechanical splices may also be used.

3.8 DEFECTIVE PILES

- A. Manipulation of piles to force them into proper position, considered by the Engineer to be excessive, will not be permitted.
- B. Any pile damaged by reason of internal defects or by improper driving shall be corrected by one of the following methods approved by the Engineer for the pile in question:
 1. The pile is withdrawn if practicable and replaced by a new and, if necessary, longer pile.

2. One or more replacement piles are driven adjacent to the defective pile.
- C. A pile driven below the specified butt elevation shall be corrected by one of the following methods approved by the Engineer for the pile in question.
1. The pile is spliced or built up as otherwise provided herein.
 2. A sufficient portion of the footing is extended down to properly embed the pile.
- D. A pile driven out of its proper location, fixed by the contract documents or by the Engineer, shall be corrected by one of the following methods approved by the Engineer for the pile in question:
1. One or more replacement piles are driven next to the out of position piles.
 2. The footing is extended laterally to incorporate the out of location pile
- 3.9 CUTOFF
- A. All piles shall be cut off to a true plane at the elevations required and anchored to the structure as shown in the contract documents.
- B. All cut-off lengths of piling shall remain the property of the Contractor and shall be properly disposed of.

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SECTION 03 11 00
CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Furnish and install formwork for cast-in-place concrete.
- B. Related sections:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 03 30 00 – Cast-in-Place Concrete
 - 3. Section 03 35 00 – Concrete Finishing
 - 4. Section 03 60 00 – Grouting

1.2 QUALITY ASSURANCE

- A. Design Criteria:
 - 1. Formwork, including forms, falsework, shoring, bracing, and accessories such as ties, anchors and hangers, shall be designed in accordance with Chapter 1 of ACI 347 – American Concrete Institute Standard Recommended Practice for Concrete Formwork.
 - 2. The design and construction of forms and form supports shall be subject to approval of the Engineer, but responsibility for their adequacy shall rest with the Contractor.
- B. Tolerances:
 - 1. Formwork shall be constructed and maintained as required to produce completed work within the tolerance limits specified in Chapter 2 of ACI 347.
 - 2. The following construction tolerances are hereby established and apply to finished walls and slabs unless otherwise shown:

<u>Item</u>	<u>Tolerance</u>
Variation of constructed linear outline from the established position in plan.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation from the level or from the grades shown.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation in the thickness of slabs and walls.	Plus 1/2-inch, Minus 1/4-inch

Variation in the location and sizes of slabs and wall openings Plus or minus 1/4-inch

1.3 SUBMITTALS

- A. Submit detailed plans of the falsework proposed to be used to the Engineer for acceptance. Such plans shall be in sufficient detail to indicate the general layout, sizes of members, anticipated stresses, grade of materials to be used in the falsework, means of protecting existing construction which supports falsework, and typical soil conditions. Submit prior to start of work.
- B. Metal forms
- C. Form Release Agent
 - 1. Confirmation of certification for conformance to NSF 61 for potable water applications

1.4 JOB CONDITIONS

- A. Falsework and vertical shoring:
 - 1. Design, construction, inspection, and removal of falsework and vertical shoring shall be in full conformance with the provisions of Section 1717 of the Construction Safety Orders, Title 8, California Code of Regulations.
 - 2. All falsework or vertical shoring installations where the height of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet shall be approved and signed by a civil engineer, registered in the State of California.
 - 3. A copy of the approved falsework plan or shoring layout shall be available on the job site at all times.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plywood for forms shall be Plyform Class I, B-B EXT-APA, conforming to the specifications of the U. S. Department of Commerce Voluntary Product Standard PS-1 requirements.
- B. Metal forms may be used on approval of the Engineer.
- C. Alternate form materials, such as hard bond fiberglass or steel, may be used to provide an F3 finish (See Section 03 35 00 – Concrete Finishing).

D. Form ties:

1. General

- a. Form ties shall be of sufficient strength and number to prevent spreading of the forms during the placement of concrete and to permit ready removal of the forms without spalling or damaging the concrete.
- b. Space ties at uniform intervals across surface; align in horizontal and vertical directions.
- c. Do not use wire ties or wood spreaders of any type.
- d. Provide form ties of such design that when forms are removed, they leave no metal or other material within 1-1/2 inches of the surface of the concrete. No form-tying device or part thereof other than metal shall be left imbedded in the concrete.

2. Cone-snap ties:

- a. Cone-snap ties shall form a cone shaped depression in the concrete with a minimum diameter of 1 inch at the surface of the concrete and 1-1/2 inches deep.
- b. Provide neoprene Waterseal washer that is located near the center of the concrete.

3. Taper ties:

- a. Neoprene plugs for taper tie holes: Size so that after they are driven, plugs are located in center third of wall thickness.

E. Form Release Agent:

- 1. When required to prevent bond, forms shall be treated with an approved compound which is not deleterious to concrete and which will not cause discoloration of the finished surface.
- 2. Use a resin base form release agent on forms for concrete to be painted.

F. Falsework and shoring:

- 1. Falsework and forms shall be constructed to produce in the finished work the lines and grades indicated on the drawings.
 - a. Suitable jacks, wedges, or camber strips shall be used in connection with falsework to set the forms to the required grade or camber and to take up any settlement in the formwork either before or during the placing of concrete.

- b. Falsework shall be formed upon solid footing safe against undermining and protected from softening.
- 2. Manufactured shores of adjustable type shall not be used if wear, damage, or defects make them incapable of supporting the loads for which they were designed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surfaces of all forms in contact with concrete shall be clean, rigid, tight, and smooth unless otherwise specified.
- B. Reusable forms shall be of such a type that they can be entirely removed and remain watertight upon reuse.

3.2 CONSTRUCTION OF FORMS

- A. Form panels that are attached directly to the studding or joists, shall be not less than 5/8-inch thick, and the studding or joists shall be placed not more than 12 inches center-to-center.
- B. Form panels less than 5/8-inch thick, otherwise conforming to the requirements specified in this section, may be used with a continuous backing of surfaced material 3/4-inch thick.
- C. Form panels more than 5/8-inch thick attached to studding or joists spaced at more than 12 inches center-to-center may be used, provided that deflection of the panel between studding or joists does not exceed that of a 5/8-inch panel attached to studding or joists spaced at 12 inches center-to-center.
- D. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar defects in the finished concrete exceeding the allowable irregularities for the formed finishes specified.
- E. Exposed edges on the outside and inside of structures shall be chamfered with triangular fillets 3/4" by 3/4", unless otherwise noted on the drawings or ordered by the Engineer.
- F. Openings shall be provided sufficient in size and number to permit convenient access to clean, inspect, and place concrete within the forms properly.
- G. Where forms for continuous surfaces are placed in successive units, the forms shall fit tightly over the completed surface so as to prevent leakage of mortar from the concrete and to maintain accurate alignment of the surface.

- H. Reset forms shall overlap the hardened concrete with sufficient tie bolts so as to prevent loss of mortar or spreading of the forms when concrete placement is resumed.
- I. Set and maintain concrete forms so as to ensure that the completed work is within the tolerances specified herein.
- J. Forms for outside surfaces shall be constructed with stiff wales at right angles to the studs, and all form ties shall extend through and be fastened to wales.
- K. Form ties:
 - 1. Cone-snap ties: Tie forms together at not more than 2-foot centers vertically and horizontally. After forms are removed from wall, fill tie holes as follows:
 - a. Remove form ties from surfaces.
 - b. Roughen cone shaped tie holes by heavy sandblasting before repair.
 - c. Dry pack cone shaped tie holes with dry-pack mortar as specified in Section 03 60 00.
 - 2. Taper ties:
 - a. After forms and taper ties are removed from wall, plug tie holes with neoprene plug as follows:
 - 1) Heavy sandblast and then clean tie holes.
 - 2) After cleaning, drive neoprene plug into each of taper tie holes with steel rod. Final location of neoprene plug shall be in center third of wall thickness. Bond neoprene plug to concrete with epoxy.
 - 3) Locate steel rod in cylindrical recess, made in plug, during driving.
 - a) At no time are plugs to be driven on flat area outside cylindrical recess.
 - b. Dry-pack of taper tie holes: After installing plugs in tie holes:
 - 1) Coat tie hole surface with epoxy bonding agent and fill with dry-pack mortar as specified in Section 03 60 00.
 - a) Place dry-pack mortar in holes in layers with thickness not exceeding tie hole diameter and heavily compact each layer.
 - b) Dry-pack the outside of the hole no earlier than 7 days after the inside of the hole has been dry-packed.

- c) Wall surfaces in area of dry-packed tie holes: On the water side of water containing structures and the outside of below grade walls:
 - i) Cover with minimum of 10 mils of epoxy gel
 - ii) Provide epoxy gel coating on wall surfaces that extend minimum of 2 inches past dry-pack mortar filled tie holes
 - iii) Provide finish surfaces that are free from sand streaks or other voids

3.3 REMOVAL OF FORMS

- A. Forms for columns, walls, sides of beams and other parts not supporting the weight of the concrete may be removed only after the concrete has sufficient strength to resist damage from deflection, misalignment, cracking, spalling, and form removal operations, particularly when form ties will be bent by the removal operations.
- B. Falsework and forms supporting cast-in-place concrete beams, slabs, or other members subject to bending stresses shall not be removed or released less than 21 days after the concrete has been placed or until the concrete has reached the specified minimum compressive strength, whichever comes first.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Furnish and install reinforcement of the shape and dimensions shown on the drawings and as specified herein.
- B. Related Sections:
 - 1. Section 01 33 00 – Submittal Procedures

1.2 QUALITY ASSURANCE

- A. Reinforcement furnished shall be subject to rigid inspection, and no material shall be shipped until all tests, analyses, and final inspections have been made and the work has been accepted by the Engineer.
 - 1. Contractor shall notify the District's Plant Inspection Section (510-287-1132) in sufficient time to permit inspection, sampling, testing, and tagging before shipment is made.
 - 2. Certificates and tests will not be required if, in the opinion of the Engineer, the reinforcement is of such minor quantity that specified certificates and tests are impractical.
- B. Mill tests and tags:
 - 1. Each bundle of steel shall be tagged by the mill with an identifying mill tag showing the name of the mill and the melt or heat number for the steel.
- C. Test samples and approval:
 - 1. Engineer may sample reinforcement at the source of supply or at point of distribution.
 - a. Two or more samples, each 24 inches long, may be taken at random from each size of bar in each melt or heat.
 - b. Contractor shall furnish test samples at no additional expense to the District.
 - 2. Engineer will attach a tag to each bundle of steel that has been inspected, tested, and approved by the Engineer.

1.3 SUBMITTALS

- A. Submit seven (7) sets of reinforcement lists, locations, diagrams, details, and bending diagrams to the Engineer, before reinforcement is fabricated.
- B. Submit a certified copy of mill test of each heat, showing physical and chemical analysis to the Engineer at the time of sampling.
- C. Submit a shipping invoice for each shipment showing the weight and heat number of each size of bar.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing steel:
 - 1. Deformed bars: ASTM A615 Grade 60
- B. Bar supports:
 - 1. Supports and spacing of spacers per standards set forth by CRSI Manual of Standard Practice.
 - 2. Supports and spacers that extend to the surface of the concrete shall be noncorrosive and nonstaining.
- C. Tie wire:
 - 1. Wire shall be 18 gauge or heavier, black annealed.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Reinforcing steel shall be accurately fabricated to the dimensions shown on the drawings.
 - 1. Bends shall be made using pin sizes as recommended by the American Concrete Institute.
 - 2. Bars shall be bent cold unless preheating is approved in advance by the Engineer.
 - 3. Bars reduced in section or having kinks or bends not shown on the contract drawings will not be accepted.
 - 4. Fabrication shall be as required to provide the minimum cover as indicated on the drawings.

- B. Welding or mechanical connections as an aid to fabrication and/or installation will not be permitted except as specifically shown on the drawings, or as approved by the Engineer.

3.2 PLACING

- A. Reinforcing bars shall be accurately placed as shown on the design and placing drawings, shall be firmly and securely held in position by means of wiring at intersections, using approved bar supports so located and of sufficient strength to resist crushing or displacement under the full load of concrete as it is placed.
 - 1. Placing of bars in fresh layers of concrete will not be permitted.
 - 2. Tie wire ends shall be bent away from and shall not contact form work.
 - 3. Placing tolerances shall be as recommended by the CRSI "Practice for Placing Reinforcing Bars" except at specific locations where shown by the design drawings as requiring closer placing tolerances.
- B. Splicing of reinforcing bars shall be as shown or indicated on the drawings or as approved by the Engineer. Splices of tensile reinforcement at points of maximum stress shall be avoided. Unless otherwise shown on the design drawings, laps shall be Class B splices per ACI 318. Welded wire fabric shall be spliced either one wire spacing plus 2 inches, or 6 inches, whichever is greater.
- C. Welded or mechanical connections (if required) shall be made at locations shown on the drawings or as approved by the Engineer.
 - 1. Welded connections shall be per AWS D1.4, Latest Edition.
 - 2. Mechanical connections shall develop 125% of reinforcing bar yield strength in either tension or compression.
 - 3. Mechanical connections shall be per manufacturer's recommendations, conforming to the applicable code requirements.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Cast-in-place concrete required for this work is shown on the drawings and includes but is not necessarily limited to:

1. Reservoir
2. Valve Structure
3. Miscellaneous Small Structures

B. Related Sections:

1. Section 01 33 00 – Submittal Procedures
2. Section 03 11 00 – Concrete Forming
3. Section 03 15 00 – Concrete Accessories
4. Section 03 20 00 – Concrete Reinforcing
5. Section 03 35 00 – Concrete Finishing
6. Section 03 39 00 – Concrete Curing
7. Section 03 41 00 – Precast Structural Concrete
8. Section 03 48 00 – Precast Concrete Specialties

1.2 QUALITY ASSURANCE

A. Qualifications of workers:

1. A foreman experienced in work being done shall be on the jobsite at all times.

B. Codes and Standards:

1. Comply with all pertinent recommendations of "Structural Concrete for Buildings", publication ACI 301 of the American Concrete Institute.
2. State of California Department of Transportation: Standard Specifications, latest edition (CSS).

C. Testing:

1. District will inspect and will perform concrete slump and strength tests. Strength tests on concrete cylinder samples will be performed in accordance with ASTM C39.
2. Strength tests on core samples will be performed in accordance with ASTM C42.

D. Concrete Samples:

1. Contractor shall provide all labor and equipment required to make the concrete samples, store them on site during initial cure, and deliver concrete cylinder samples to EBMUD Materials Testing Laboratory located at the address listed in Article 1.3.
 - a. Samples shall be made by an ACI certified Concrete Field Testing Technician in accordance with ASTM C31 and ASTM C172.
 - b. Unless specified otherwise, one set of eight 4"x8" cylinders shall be molded at the same time of each mix being placed, each day:
 - 1) At least once a day
 - 2) At least once for each 100 cubic yards placed, and
 - 3) At least once for each 5,000 square feet of surface area of slabs and walls.
 - c. Label samples using a nomenclature provided by the Engineer.

E. Additional Core Samples and Tests:

1. If, in the opinion of the Engineer, results of tests on concrete cylinders indicate the possibility of substandard concrete in the structure, cored samples may be required to be taken from the placed concrete. The contractor shall provide all labor and equipment required to obtain the core samples.
 - a. The contractor shall take 3 cores of the area representing the cylinders in which the strength is in question and deliver them to EBMUD Materials Testing Laboratory for strength tests.
 - 1) Core samples shall be obtained in accordance to ASTM C42.
 - b. If the results of the core tests indicate the concrete that has been placed does not meet the specification, remove and replace the defective concrete at no additional cost to the District.
 - c. The Contractor may be reimbursed per Document 00 72 00 Article 7 for the coring cost if test results on the core samples indicate that the placed

concrete meets the specification, and if it can be demonstrated that the original concrete cylinder samples were properly obtained.

F. Concrete Mix:

1. The design of the concrete mixtures shall be the responsibility of the Contractor, and shall be subject to review and approval by the Engineer.
 - a. Concrete mix shall be designed, in accordance with ACI 318, Chapter 26, by an approved independent testing laboratory, employed by the Contractor, and the design submittal shall be signed by a California-registered Civil or Structural Engineer.
 - 1) The testing laboratory shall submit certified copies of all laboratory trial mix reports to the Engineer.
 - 2) Do not place concrete prior to the Engineer's review of test reports and approval of mix design.
 - b. Concrete shall be composed of a cementitious material, water, fine and coarse aggregates and admixtures.
 - c. The cementitious materials shall be Portland cement or Portland cement in combination with pozzolan.
 - d. The admixture shall be an air-entraining agent plus either a water reducing admixture or a water reducing retarding admixture as approved by the Engineer.
 - e. The proportions of all material used in the concrete shall conform to the approved mix design. Adjustments may be made to the batch weights or cement and water as necessary to maintain the water-cement ratio and the stipulated slump, with approval of the Engineer.
2. Minimum content of cementitious materials in structural concrete shall be as follows:

<u>Cementitious Material Used</u>	<u>Minimum Content in Pounds Per Cubic Yard of Concrete</u>
a. Portland cement only	____ 602
b. Portland cement in combination with pozzolan	____ 553/75 - cement, and 75 - pozzolan

3. Aggregate content: The nominal maximum size of aggregate used in structural concrete shall conform to the following requirements:

<u>Locations</u>	<u>Size</u>
a. Sections over 8 inches in thickness in which the clear distance between reinforcement is at least 2-1/4 inches.	1"x No. 4
b. Sections 8 inches or less in thickness or with a clear distance between reinforcement less than 2-1/4 inches.	3/4" x No. 4

Note: The nominal maximum size aggregate shall not be increased for these features, but may be decreased for sections requiring a special quality of concrete as directed by the Engineer.

4. Air Content:

- a. The air content by volume based on measurement made immediately after discharge from the mixer shall be determined by ASTM C231.
- b. The total calculated air content of the sample prepared in accordance with ASTM C231 shall be between 2% and 4%.

G. Quality Control:

1. Batch plant shall be approved by the Engineer in advance of use for this work.

1.3 SUBMITTALS

A. Submit concrete mix design to the Engineer for approval.

- B. Representative samples of materials required for testing under this section shall be submitted to the EBMUD Materials Testing Laboratory, 1100 21st Street, Oakland. A minimum of one day in advance, make an appointment for the sample delivery by calling the laboratory at (510) 287-1990 between 8:00 a.m. and 10:00 a.m.

1. Complete a submittal log similar to the Concrete Data Sheet shown in Appendix A. A Microsoft Word electronic version of the Concrete Data Sheet template will be made available upon request.

C. Portland Cement:

1. Submit manufacturer's certificate of compliance with ASTM C150 and standard physical and chemical analysis.

D. Pozzolan:

1. Furnish with each shipment a certificate with test data showing compliance with ASTM C618.

E. Admixtures:

1. Submit 10-ounce sample of each product proposed for use in concrete mix if requested.
2. Submit with sample the manufacturer's test data showing performance of product in concrete as to air content, water reduction, retardation, and effect on concrete strength at various ages, for concrete temperatures ranging 50 degrees F to 90 degrees F.

F. Aggregates:

1. Submit for the Engineer's approval, two weeks in advance of the concrete work, a representative sample of each size of fine and coarse aggregate to be used. Size of each sample shall be not less than 50 pounds.

G. Bonding agents:

1. Submit the product information and the manufacturer's recommendations for the product application for the Engineer's approval prior to use.

1.4 PRODUCT DELIVERY AND STORAGE

- A. Ship cement in paper sacks or in bulk.
- B. Store cement, pozzolan, aggregates and admixtures so that they are protected against deterioration from any cause.
- C. Keep separate the several sizes of fine and coarse aggregate while in storage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All structural concrete shall have a minimum compressive strength of 4,000 psi at 28 days.
- B. Portland Cement:
 1. Portland cement shall conform to ASTM C150, Type II, and shall not contain more than 0.60% by weight of alkalis (calculated as sodium oxide plus 0.658 potassium oxide). Tested and certified cement shall not be mixed with, nor contaminated by, any other cement.

C. Pozzolan:

1. Pozzolan for cement replacement shall conform to ASTM C618 Class N or Class F (fly ash) with the following exception:
 - a. Pozzolanic activity index with lime, at 7 days, shall be 1000 psi minimum. (Table 2, ASTM C618)

D. Admixtures:

1. Types:

- a. Air entraining admixtures (AEA) shall conform to ASTM C260.
- b. Water reducing admixtures and water reducing and retarding admixtures (WRA and WRR) shall conform to ASTM C494, Type A and D.
- c. Accelerating admixtures containing chlorides shall not be used.

2. Preparation:

- a. Prepare admixtures in solution, maintain at uniform strength as recommended by the manufacturer, batch accurately by means of a reliable mechanical dispenser and visible check gauge, and add to the batch in the mixing water.

3. Specified admixtures:

- a. Contractor shall add approved admixtures to all concrete. If requested, the Contractor shall submit a sample for testing as specified in Article 1.3.

4. Costs:

- a. Include cost for furnishing and adding air entraining agent or other specified admixture to the concrete in the Contractor's bid for the work, and no extra compensation will be allowed thereafter.
- b. Payment for furnishing and adding admixtures ordered by the Engineer but not covered by these specifications will be made as extra work as provided in the General Conditions.
- c. The Contractor shall pay the cost of any admixture damaged, wasted, or used in unspecified concrete.

E. Water:

1. Water for mixing and curing concrete, washing aggregates, and mixing mortar shall conform to the requirements of CSS 90 - 1.02.D.

F. Aggregates:

1. Fine Aggregate (100% passing 3/8" mesh)

a. Conform to ASTM C33 with the following exceptions:

- 1) When tested in accordance with ASTM C136, fine aggregate shall conform to the following limits:

<u>Sieve Number</u>	<u>% by Weight Retained on Sieve</u>
4	0 – 6
8	5 – 22
16	10 – 27
30	15 – 28
50	15 – 27
100	12 – 20
200	0 – 7
Pan	0 – 3

- 2) Fineness modulus shall be not less than 2.50, nor more than 3.00.

- 3) Specific gravity S.S.D. shall not be less than 2.60.

b. Free water shall not vary more than 5% in consecutive batches.

c. Fine aggregate conforming to CSS Section 90-3.03 is also acceptable.

2. Coarse Aggregate (No. 4 to 1")

a. Conform to ASTM C33 with the following exceptions:

- 1) When tested in accordance with ASTM C136, coarse aggregate shall conform to following limits designated by the Engineer:

<u>Sieve Size</u>	<u>Percent by Weight Passing</u>	
	<u>Primary Aggregate Nominal Sizes</u>	
	<u>1" x #4</u>	<u>3/4" x #4</u>
1-1/2'	100	-
1"	88 – 100	100
3/4"	65 – 90	90 – 100
3/8"	15 – 35	15 – 40
No. 4	0 – 5	0 – 5

- 2) Cleanness Test: Samples from the batching bin shall have a cleanness value of not less than 75 (State of California, Division of Highways, Test Method No. Calif. 227).

- b. Coarse aggregate (1" x No. 4) conforming to CSS Section 90-3.02 is acceptable for Location a. only. See Article 1.2 F - Concrete Mix.
- 3. Wetting of Aggregate:
 - a. Perform wetting of aggregate for cooling, or rewashing to provide clean aggregate, in advance of delivery into the batching plant bins. Material shall have uniform and stable moisture content as batched, and such that the variations in aggregate moisture will not cause variations in slump from batch to batch of more than 1/2 inch. Any added moisture shall be in accordance with the water cement ratio specified in the approved mix design.

G. Synthetic Fiber Reinforcing Material:

- 1. Reinforcing material shall be 100% virgin polypropylene fibrillated fibers containing no reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement. Material shall conform to ASTM C1116, Type III, and Performance Level I, Toughness Index I₅, as outlined in Section 21 (Note 17) of ASTM C1116.
- 2. Acceptable manufacturers:
 - a. Fibermesh Company, Vallejo, CA, (707) 642-7747
 - b. Or equal as approved by the Engineer.

H. Bond breaker: Non-staining type, providing positive bond prevention.

- 1. Manufacturers and products:
 - a. Williams Distributors, Inc., Seattle, WA; Williams Tilt-Up Compound
 - b. SCA Construction Supply Div., Superior Concrete Accessories, Franklin Park, IL; Silcoseal 77
 - c. Burke Co., San Mateo, CA; Burke Clean Lift Bond Breaker or Burke Tilt Free Bond Breaker
 - d. Or equal as approved by the Engineer.

I. Patching material:

- 1. Contain no chlorides or other chemicals causing steel corrosion.
- 2. Low pressure silica fume mortar, EMACO as manufactured by Master Builders, Co, or equal as approved by the Engineer

2.2 SPECIAL CONCRETE

- A. Concrete for curbs, gutters, sidewalks and driveways shall contain one pound of lamp black per cubic yard or its equivalent in approved liquid solution.

PART 3 - EXECUTION

3.1 PREPARATIONS PRIOR TO PLACING CONCRETE

- A. Remove standing water, mud, and debris from foundation surfaces.
- B. Clean reinforcement of loose mill and rust scale, mortar, oil, dirt and coatings that reduce bond.
- C. See Section 03 11 00 regarding treatment of forms.
- D. Approximately 30 minutes before concrete is placed, saturate wood forms and absorptive foundations with water.

3.2 BATCHING

- A. General:
 - 1. Provide and maintain means and equipment required to determine and control the relative amounts of the various materials, including water, cement, admixture, sand, and each individual size of coarse aggregate entering the concrete.
 - a. Proportion batches of concrete on the basis of integral sacks of cement unless the cement is weighed.
 - b. Determine amounts of sand and individual size of coarse aggregate entering each batch of concrete by weighing, and the water by either weighing or metering.
 - 2. Deposit materials in the batch bins directly over the discharge gates. Coarse aggregate shall be deposited in the batch bins through effective rock ladders when the free drop exceeds four feet.
 - 3. Construct, maintain and operate equipment for conveying batch materials from the weighing and batching hoppers so that there will be no spillage of the batched materials or overlapping of batches.
 - 4. The Engineer may inspect the batching operations at any time.
 - 5. The Engineer may reject any concrete that is produced by batching equipment or operations that do not meet the requirements of the specifications.
 - 6. Contractor shall give the Engineer 24 hours advance notice when batching is to be done.

7. Provide sufficient trucks of adequate size to ensure continuous delivery of batched material. Each truck shall carry a delivery ticket showing the mix number, size of batch, and the time it was batched. The ticket shall show the reading of the revolution counter at the time the truck mixer was charged.

B. Weighing and metering equipment:

1. Weighing and metering equipment shall be sealed by the California State Division of Weights and Measures.
2. Construct and operate batching equipment so that when the entire plant is running the combined inaccuracies in feeding and measuring materials will not exceed 1 percent for water or cement and pozzolan, 1 percent for any size of aggregate, and 1-1/2 percent for the total aggregate in any batch.
 - a. Equipment for convenient confirmation of the accuracy of measurement is required for each batch.
 - b. Equipment for water measuring shall be such that leakage will not occur when the valves are closed.
3. Provide standard test weights and other auxiliary equipment required for checking the operating performance of each scale or meter and make periodic tests in the presence of the Engineer. Furnish the Engineer with results of check tests made, and make adjustments, repairs, or replacements as the Engineer may consider necessary to secure satisfactory performance.
4. Where the batching plant involves the use of storage bins and weighing hoppers, each weighing unit shall include a visible springless dial or equal suitable device as approved by the Engineer which will register the scale load at any stage of the weighing operation from zero to full capacity.
 - a. Construct weighing hoppers so as to permit the convenient removal of material in excess of prescribed tolerances.
 - b. Each dial and water-measuring device shall be in full view of the operator, and, if practicable, the weighing equipment shall be arranged so that the operator may conveniently observe the operation of the bin gates and also the materials discharged into the mixing hopper.
5. Interlocked equipment
 - a. Interlock batching equipment in automatic plants so that:
 - 4) A new weighing cycle cannot be started until all the batchers are completely emptied and the dispatcher discharger gates and valves are closed.

- 5) The batcher discharge gate cannot be opened until the correct weights of the materials are in the batching hoppers and the scales in balance.
- 6) The discharge gates cannot be closed until all materials are entirely discharged from the hopper and are back in balance.
- b. Interlock water valve so that batcher discharge valve cannot be opened until the filling valve is closed.
- c. Interlock admixture dispenser to operate with the water batcher.
6. Dispensers for air admixtures shall have sufficient capacity to measure at one time the full quantity of properly prepared solution required for each batch.
 - a. Unless these admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow uniformly into the water stream for the batch, from beginning to the end of its flow into the mixer.
 - b. Air entraining agents and water reducing retarders shall not vary from the required dosage more than five (5) percent.

3.3 MIXING AND DELIVERING

- A. Ready-mixed concrete shall be mixed and delivered to the site of the work by means of one of the following operations:
 1. Central mixed concrete: Mix completely in a stationary mixer. Transport the mixed concrete to the point of delivery in truck agitators or truck mixers operating at agitating speed. Non-agitating hauling equipment will not be permitted.
 2. Shrink-mixed concrete: Mix partially in a stationary mixer and complete the mixing in a truck mixer.
 3. Transit-mixed concrete: Mix completely in a truck mixer.
- B. Mixing shall be in accordance with the following requirements:
 1. Mix concrete ingredients in batch mixers until homogeneous and of uniform consistency.
 - a. The mixing of each batch shall continue for not less than 1-1/2 minutes for concrete not containing pozzolan, and for not less than 2 minutes for concrete containing pozzolan along with all ingredients, except the full amount of water, in the mixer.
 - 1) Minimum mixing period specified is predicated on the manufacturer's recommended speed of rotation of the mixer and the

introduction of the materials, including water, into the mixer in accordance with ACI Standard 304, paragraph 4.3.

- b. District reserves the right to increase the mixing time when the charging and mixing operations fail to result in the required uniformity of composition and consistency within the batch, and from batch to batch.
- c. Add water prior to, during, and following the mixer-charging operations. No additional water shall be added to the batch to preserve the required concrete consistency despite excessive over-mixing.
- d. Reduce batch sizes for ready-mixed concrete as necessary to avoid excessive mixing, loss of slump, and standby time.

C. Mixers and agitators:

- 1. Mixers may be stationary mixers or truck mixers.
 - 2. Each mixer and its operation shall be subject to the approval of the Engineer, and any mixer that at any time produces unsatisfactory results, in the opinion of the Engineer, shall be repaired promptly and satisfactorily or shall be replaced.
 - 3. Operate mixers and agitators within the limits of capacity and speed of rotation designated by the manufacturer of the equipment.
 - 4. Equip each mixer other than truck mixers with a satisfactory mechanically operated timing and signaling (or locking) and metering device for indicating and assuring the completion of the required mixing period and for counting the batches.
 - 5. Equip truck mixers with counters of the continuous-registering, non-resettable type which accurately measure the number of revolutions of the drum or blades. Mount counters where the Engineer may safely and conveniently inspect them from alongside the trucks.
- D. When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements of transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing at a central plant.
- E. When transit-mixed concrete is furnished, each batch of concrete shall be mixed for not less than 70 nor more than 100 revolutions of the drum or blades. The mixing speed shall be at the rate of rotation designated by the equipment manufacturer.
- 1. Additional mixing shall be at the speed designated by the equipment manufacturer as agitating speed.
 - 2. All materials, including water, shall be in the mixer drum before starting the count of the number of revolutions of mixing.

3. Mixing operations shall begin within 30 minutes after the cement has been intermingled with the aggregates.
- F. When a truck mixer or agitator is used for transporting concrete, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or before the drum has completed 300 revolutions, whichever comes first, after introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.
1. The Engineer will consider waiving the above limitations if it can be demonstrated to his satisfaction that the concrete workability is such that it can be satisfactorily placed and finished without the addition of water.
 2. When truck mixer or agitator arrives at the job site, the concrete shall be observed for slump. If the slump exceeds that permitted in the specification, the concrete will be rejected. If the slump is less than specified, water may be added at this time, and at this time only, to obtain the slump permitted.
 3. The Contractor will remain responsible for the concrete strength regardless of if above adjustments have been made.
- G. No rejected concrete, the defects of which have been subsequently corrected, shall be used in the work unless approval has been given by the Engineer.

3.4 CONVEYING

- A. The methods and equipment used for conveying or transporting concrete shall maintain the concrete's required composition and consistency without segregation or loss of slump.
1. Extensive shifting of the mass of fresh concrete by vibrating will not be permitted.
 2. Use elephant trunks or adjustable pipe if fall is more than 6 feet.
 3. Conveyor belts shall not segregate concrete or spill mortar.
 4. Concrete pumps shall be capable of pumping concrete without an increase in slump or decrease in aggregate size. Air slugger used with a concrete pump shall be as recommended by the pump manufacturer, and shall be kept to a minimum.
 5. Aluminum pipe for conveying concrete is prohibited.
 6. Chutes:
 - a. Use only for small isolated sections of the work with the permission of the Engineer.
 - b. Water to promote free flow of concrete in chutes will not be permitted.

3.5 PLACING

A. General:

1. Place concrete in the presence of the Engineer.
2. Concrete in each integral part shall be placed continuously. Contractor will not be permitted to commence work on any part unless his facilities and his forces on hand are sufficient to complete the placing and finishing of the concrete.
3. Concrete shall not be deposited over reinforcement, conduit, or piping until the Engineer has inspected the placing and given permission to proceed.
4. Place concrete while fresh before it has taken initial set. Concrete that has partially hardened shall not be retempered with additional water.
5. Place concrete in continuous, approximately horizontal layers; depths shall not exceed 24 inches. Build layers of concrete with square ends and level tops.

B. Rain:

1. Do not place concrete in the rain unless the concrete is protected from the addition of extra water.
2. Equipment and materials needed for rain protection shall be immediately available during concrete placement.

C. Temperature:

1. General:

- a. Fresh concrete when placed shall have a temperature of not more than 80 degrees F and not less than 50 degrees F.

2. Cold weather concrete:

- a. Protect newly placed concrete against freezing.
- b. Remove ice, snow, and frost from placement area, before concrete is placed. Concrete shall not be placed on a frozen subgrade.
- c. Provide all necessary materials and equipment for the protection of newly placed concrete.
- d. When the mean daily temperature is predicted to drop below 40 degrees F, the concrete shall be maintained at a temperature above 50 degrees F for not less than 72 hours after it is placed. Protect formed concrete or slab surfaces with commercial insulating blankets not less than 1" in thickness.

D. Foundations:

1. Concrete in foundations shall be placed on original and undisturbed material unless otherwise shown on the drawings or unless required excavation prevents utilization of such foundation.
2. Provide and maintain pumping equipment to keep excavations free of water while concrete is being placed and for such time afterward to permit proper protection of the concrete during curing.
3. Intercept and remove water so there will be no flow into or through the freshly placed concrete.

E. Monolithically Placed Concrete:

1. If concrete is placed monolithically around openings having vertical dimensions greater than two feet, or if concrete in decks, slabs, girders, and other similar parts of structures is placed monolithically with supporting concrete, the following instructions shall be followed:
 - a. Place concrete over openings and in decks, slabs, beams, girders, and other similar parts of structures with as low a slump as practicable. Special care shall be exercised to achieve thorough consolidation.
 - b. Delay placing concrete from one to three hours at the top of openings and the bottom of decks, slabs, beams, girders, and other similar parts of structures; placing shall not be delayed so long that vibrating unit will not readily penetrate, by its own weight, the concrete placed before the delay.
 - c. Place last two feet or more of supporting concrete with as low a slump as practicable. Exercise special care to achieve thorough consolidation.
 - d. Surfaces of concrete where delays are made shall be clean and free of loose and foreign material when concrete placing is resumed.

F. Placing concrete under water:

1. Place concrete under water by means of a tremie.
 - a. Exclude air and water from the pipe by keeping it constantly filled with concrete.
 - b. Keep the lower end of the tremie buried in the concrete as discharge takes place until the structure or lift is completed.
 - c. To prevent segregation, concrete shall be placed in a compact mass and not be vibrated nor disturbed after being deposited. Water shall be maintained in a still condition at the point of deposit.

3.6 CONSOLIDATING

- A. Consolidate concrete by means of high frequency internal vibrators with operating speeds of not less than 7,000 vpm, except under water.
- B. Employ ample number of vibrators to consolidate the incoming concrete to the proper degree within five minutes after it is deposited.
 - 1. Number of vibrators will be predicated on the nature of the job and the ability to sufficiently consolidate the concrete within the specified time.
 - 2. In general, the number of vibrators available for use at the forms shall be as follows:
 - a. One vibrator for each five cubic yards of concrete placed per hour, and one standby vibrator for each three (or portion of three) vibrators in service.
 - b. Two vibrators in good working order shall be present at the forms.
- C. Provide a reliable source of power for vibrators.

3.7 JOINTS IN CONCRETE

- A. Joints in concrete work shall be made only where indicated on the drawings or where approved by the Engineer.
- B. Screeds shall be securely set for horizontal joints in concrete work, and for the tops of walls. See Section 03 35 00.
- C. When concrete is placed against previously hardened concrete, the interface shall be clean, free of laitance, and intentionally roughened to a full amplitude of approximately 1/4-inch.
- D. Where concrete has set, see Article 3.8.

3.8 PACKING CONE HOLES AND REPAIRING CONCRETE IMPERFECTIONS

- A. After forms have been removed, make form tie holes watertight by roughening and moistening the surface and dry packing with a mixture of one part cement to three parts concrete sand.
 - 1. Resulting surface shall be finished to blend with the surrounding concrete.
 - 2. Cure repairs in accordance with Section 03 39 00.
- B. Repair rock pockets, honeycomb, mortar leaks, and other imperfections which require concrete or mortar replacement in accordance with Chapter VII of the Bureau of Reclamation Concrete Manual.

1. Method and manner of making repairs shall be as approved by the Engineer and performed in his presence.
- C. Irregularities in concrete shall be repaired by bush hammering and grinding or building up as directed.
- D. Certain surface imperfections and irregularities may be left unrepaired when in the Engineer's judgment, they do not affect the structural integrity or soundness of the concrete and their repair would detract from the appearance of the structure.
- E. Use an approved bonding agent to assure a bond of the repair material to the old concrete. Apply according to the manufacturer's recommendation.

3.9 PACKING EQUIPMENT SUPPORT BASES

- A. Dry pack under the equipment support bases using a mortar mixture consisting of one part cement to three parts of concrete sand.
- B. Finish the resulting surface smooth at approximate one to one slope.
- C. Cure in accordance with Section 03 39 00.

3.10 FIELD QUALITY CONTROL

- A. Responsibility for testing: See Article 1.2.
- B. Compressive strength tests
 1. Provide such facilities and equipment as are necessary to procure and handle representative samples of concrete, and to safeguard test cylinders stored at the site of the work.
- C. Slump tests
 1. The slump determined by the Engineer in accordance with ASTM C143 at the point of placement shall not exceed the following:
 - a. Structures, flat slabs, and where not specified: 3 inches
 - b. Walls: 4 inches
 2. Tolerance
 - a. Slump tolerance shall be plus or minus 1/2-inch.

END OF SECTION

SECTION 03 39 00
CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Cure and protect all freshly placed concrete in accordance with this section.
- B. Related sections:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 03 11 00 – Concrete Forming
 - 3. Section 03 20 00 – Concrete Reinforcing
 - 4. Section 03 30 00 – Cast-in-Place Concrete
 - 5. Section 03 35 00 – Concrete Finishing

1.2 SUBMITTALS

- A. Submit curing compound product literature and application instructions a minimum of 30 days prior to use.
- B. Submit method and materials to be used for water curing a minimum of 30 days prior to use.

1.3 PRODUCT HANDLING, STORAGE AND DELIVERY

- A. Deliver materials in manufacturer's original, unopened containers with labels intact and legible.
- B. Deliver materials in sufficient quantity to allow continuity of work.

PART 2 - PRODUCTS

2.1 WATER

- A. Water used for curing concrete shall be potable. See Section 01 50 00.

2.2 CURING COMPOUNDS

A. Applications for potable water facilities

1. Curing compound shall be water-based, clear, and odor less conforming to ASTM C309, Type 1-D, and certified per NSF 61.
2. Acceptable products
 - a. Quantum-Cure 61, Atlas Construction Supply Inc.
 - b. Or equal as approved by the Engineer

B. Applications for non-potable water facilities

1. Curing compound shall be resin-based, clear, conforming to ASTM C309, Type 1-D.
2. Acceptable products:
 - a. Burke Aqua Resin Cure (clear), Edoco by Dayton Superior
 - b. 1100-Clear, W. R. Meadows
 - c. Or equal as approved by the Engineer

2.3 CURING BLANKETS

- A. Shall be an absorptive mat or layers or fabric weighing a minimum of 12 ounces per square yard when dry

PART 3 - EXECUTION

3.1 GENERAL

- A. Keep wood forms wet at all times until removed or for 14 days, whichever comes first, to prevent the opening of joints and drying out of the concrete.
1. Provide at least 350 degree days of curing (50 degrees times 7 days of 24 hours each).
 2. If hourly temperatures at any surface of a concrete placement drop below 50 degrees Fahrenheit during the curing period, count the period below 50 degrees Fahrenheit as zero degrees, and extend the curing time to compensate.
- B. Coordinate repairs or treatment of concrete surfaces so that no interruption of the curing, except for very short periods of time, will be necessary.

- C. Any surface that is to receive liquid-applied waterproofing shall be water-cured only.

3.2 WATER CURING

- A. Keep concrete continuously wet for a minimum period of 14 days.
 - 1. Each day forms remain in place will be counted as 1 day of water curing.
 - 2. Do not loosen form ties during period when concrete is cured by leaving forms in place. No further curing credit will be allowed for forms remaining in place after contact has been broken between concrete surface and forms.
- B. Begin water curing as soon as concrete attains initial set.
- C. Maintain a wet surface by ponding, continuous sprinkling, covering with saturated burlap, or otherwise maintaining free water visible on the surface by means acceptable to Engineer:
 - 1. Flood top of walls with water at least 3 times per day, and keep surfaces moist at all times during 14 day curing period.
 - 2. Provide plastic sheet material over surfaces if required to maintain a wet surface during arid or windy conditions. See plastic membrane curing requirements for additional details.
- D. Use water having a temperature within 20 degrees Fahrenheit of the temperature of concrete, and not lower than the minimum temperature allowed for the concrete surface during curing.

3.3 PLASTIC MEMBRANE CURING

- A. Install plastic membrane as soon as concrete is finished, and can support limited pedestrian traffic without damage.
- B. Cover entire surface of finished concrete with membrane.
- C. Anchor membrane to prevent uplift from wind or air trapped below the sheet.
- D. Fully seal joints and edges to provide full seal around perimeter.
- E. Keep concrete under plastic membrane moist, regularly monitoring surfaces and adding supplemental moisture if necessary. Add water as specified for water curing.

3.4 SPRAYED MEMBRANE CURING COMPOUND

- A. Apply curing compound to concrete surface after repairing and patching, and within 1 hour after forms are removed:

1. If more than 1 hour elapses after removal of forms, do not use membrane curing compound. Instead, provide water curing for not less than 14 days.
 2. Do not remove sprayed membrane curing compound from concrete in less than 14 days after initial application.
 3. When application of curing compound at concrete joints is accepted by Engineer, take care to apply curing compound to all surfaces along full profile of joints.
- B. Apply curing compound by mechanical, power operated sprayer with mechanical agitator that will uniformly mix all pigment and compound:
1. Apply curing compound in at least 2 coats.
 2. Apply each coat in direction turned 90 degrees from application direction of the preceding coat.
 3. Apply curing compound in sufficient quantity so that concrete has uniform appearance, and its natural color is effectively and completely concealed at time of spraying.
 4. Continue to coat and recoat surfaces until specified coverage is achieved and until coating film remains on concrete surfaces.
- C. Thickness and coverage of curing compound:
1. Provide curing compound having film thickness that can be scraped from surfaces at any and all points after drying for at least 24 hours.
 2. The Contractor is cautioned that method of applying curing compound specified in this Section may require more curing compound than normally suggested by manufacturer of curing compound, and is more than is customary in the trade. Apply amounts specified in this Section, regardless of manufacturer's recommendations or customary practice.
- D. If Contractor desires to use a curing compound other than specified product, coat sample areas of concrete wall with proposed curing compound, and also coat similar adjacent area with the specified compound in the manner specified, for comparison:
1. If proposed sample is not equal or better, in opinion of the Engineer, the proposed substitution will not be allowed.
- E. Removal of curing compound:
1. After curing period is complete, remove curing compound placed on surfaces that will receive additional concrete, including all concrete joint surfaces, by abrasive blasting or by other means acceptable to Engineer. Complete removal and cleanup prior to placing any new concrete against the surface.

2. Where additional finishes will be applied over concrete surfaces, unless otherwise recommended by the manufacturer of the finish to be applied, remove curing compound by sandblasting. Provide blasting as necessary to fully remove curing compound.
- F. Prior to final acceptance of the work, remove, by sandblasting or by other method acceptable to the Engineer, any curing compound on surfaces exposed to process water or exposed to view, so that only natural color of finished concrete is visible and uniform over the entire surface.

3.5 SCHEDULE OF CURING METHODS

A. Cure the following concrete surfaces using water curing:

1. Floor surfaces of water containment structures.
2. Surfaces where additional concrete will be placed over or against the surface, including concrete joints.
3. Surfaces where grout or other toppings will be placed over the surface.
4. Slabs scheduled to receive concrete sealer, or other bonded or adhered architectural finishes.
5. Formed surfaces scheduled to receive coatings, paint, adhered masonry, cementitious materials, liquid-applied waterproofing, or other similar finishes, and where formwork is removed within 7 days after concrete placement.
6. Horizontal concrete surfaces at tops of walls.

B. Cure the following concrete surfaces by water curing, plastic membrane curing, or sprayed curing membrane. Selection of methods shall be at the Contractor's option:

1. Surfaces not listed in the preceding paragraph.

END OF SECTION