

REQUEST FOR PROPOSAL (RFP)
for Influent Pump Station (IPS)
Resiliency Design Project,
Engineering Consultant Services

ADDENDA

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

CONTACT

Jennifer Ku, Associate Civil Engineer
(510) 287-1681
jennifer.ku@ebmud.com

RESPONSE DUE

December 20, 2024
4:00 p.m. PST

SUBMIT ELECTRONICALLY TO*

Jennifer Ku, EBMUD
jennifer.ku@ebmud.com

**Hardcopy proposals will not be accepted*

EAST BAY MUNICIPAL UTILITY DISTRICT

RFP for
Influent Pump Station (IPS) Resiliency Design Project
Engineering Consultant Services

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- EXHIBIT B – INSURANCE REQUIREMENTS
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- EXHIBIT G – ENVIRONMENT, HEALTH, SAFETY AND SECURITY CHECKLIST

I. STATEMENT OF WORK

A. SCOPE

It is the intent of these specifications, terms, and conditions to describe the professional engineering consultant services needed for the seismic retrofit, equipment upgrades and electrical improvements of the East Bay Municipal Utility District's (District) Main Wastewater Treatment Plant (MWWTP) Influent Pump Station (IPS) under SD-437. The IPS is responsible for lifting all wastewater flows into the MWWTP and is the most critical structure at the treatment facility. See Exhibit E for the full scope of work.

The IPS was constructed in 1951, underwent an expansion with significant modifications in the early 1990s, and has only had minor structural improvements since then. The District recently completed a planning study titled the IPS Resiliency Project, which included a seismic retrofit preliminary design of the IPS. In addition to the seismic retrofit preliminary design, the IPS Resiliency Project included evaluations and recommendations for replacement and upgrades of existing equipment and modifications to the building's power supply infrastructure.

The District intends to award a contract to the Proposer(s) who best meets the District's requirements. The objectives of this professional services contract are to perform engineering evaluations, develop and prepare final design drawings and specifications, produce construction bid documents, support the bid process and provide engineering services during construction (ESDC) for the seismic retrofit, equipment upgrades and electrical improvements.

The District is also issuing a separate RFP for an Independent Peer Review of the seismic retrofit design. While the design contract scope includes more than seismic retrofit work, the Independent Peer Review will only review the seismic retrofit design portion of the project. Award for the design contract is expected to be concurrent with the award of the Independent Peer Review contract.

B. PROPOSER QUALIFICATIONS

1. See Exhibit A – RFP Response Packet, Required Documentation and Submittals, for specific materials to be included in the proposal. Proposer's qualifications should be addressed in the Statement of Qualifications (SOQ).
2. Proposer Minimum Qualifications
 - a. Proposer, Proposer's principal, or Proposer's staff shall have been regularly engaged in the business of providing design services for water/wastewater treatment facilities and seismic evaluation in high seismic hazard zones for at least five (5) years within the last ten (10) years.

- b. Lead Firm
 - (1) The lead consulting firm must provide information that demonstrates its experience on projects of similar type, size, and complexity as the current project under consideration. Experience must include at least two seismic retrofit design projects and at least two projects with equipment upgrades and electrical improvements for a wastewater or water treatment plant within the last ten years. The relevance of cited projects, and the experience of specific individuals proposed for the current project, should be emphasized. The lead firm shall oversee and coordinate all aspects of the proposed project team's scope of work.

- c. Proposer's project manager (PM) assigned to this project shall have the following experience:
 - (1) Employee of the Lead Firm
 - (2) At least ten (10) years of experience managing multi-disciplinary projects that requires close coordination among structural, architectural, mechanical, and electrical disciplines.
 - (3) As project manager, successful completion of at least one (1) design project for a wastewater or water treatment plant project within the last five (5) years. Project shall have a consultant contract value over \$500,000.
 - (4) Experience in managing the preparation of bid documents for construction, including for municipal capital improvement projects.
 - (5) Experience providing engineering services during construction, including reviewing submittals, requests for information (RFIs), preparing change order-related documents, reviewing change orders and claims management, and supporting startup and commissioning.

- d. Key Personnel
 - (1) Key Personnel must have at least three years of experience in their respective disciplines and must demonstrate relevant experience from at least two projects.

- e. The Qualifications of the proposer's firm, any subconsultant(s), and project team must collectively demonstrate experience on projects of similar type,

size, and complexity as the proposed project. A project may be used for more than one category. Experience must include at least the following:

- (1) Two (2) seismic evaluation and retrofit design projects for wastewater or water treatment, or similar large industrial processing facilities in a high seismic hazard zone, resulting in the production of bid documents for construction and requiring engineering services during construction, completed within the last ten (10) years. At least one project shall have had a consultant contract value over \$500,000.
- (2) One (1) seismic evaluation and retrofit design project, including non-structural and electrical elements in a high seismic hazard zone, resulting in the production of bid documents for construction, completed within the last ten (10) years.
- (3) Three (3) design projects with equipment upgrades, electrical improvements, and new installation for existing water/wastewater treatment facilities (or similar). Projects shall include design, construction support, and startup experience on power distribution system of medium voltage for industrial or utility facilities as well as low voltage control system associated with PLC and/or DCS control, resulting in the production of bid documents for construction and requiring engineering services during construction, completed within the last ten (10) years. At least one project shall have had a consultant contract value over \$500,000.

f. The Proposer's staff or subconsultants shall stamp all deliverables, reports, drawings, and specifications. Stamps shall be of their relevant disciplines including but not limited to:

- (1) California Professional Engineer(s), Structural Engineer(s), Electrical Engineer(s) and Control System Engineer(s) in good standing licensed with the Board for Professional Engineers, Land Surveyors, and Geologists.

g. Proposer shall possess all permits, licenses, and professional credentials necessary to perform services as specified under this RFP.

c. SPECIFIC REQUIREMENTS

A conceptual and preliminary design has been previously prepared for the seismic retrofit and other improvements of the IPS Building. The Consultant selected through this RFP will review the existing Basis of Design and determine if it is acceptable for the

Consultant to utilize it for the framework of the Consultant's detailed design. The Consultant may make modifications to develop their own Basis of Design.

The specific items that were looked at in the preliminary design included:

- Seismic retrofit and equipment anchoring
- Flow meter replacement
- Power distribution realignment
- Pump control system replacement
- Fluid power hydraulic system replacement
- Lube oil pump system relocation and replacement

The Consultant shall prepare the final design documents for two separate bid packages. One bid package (Seismic) will consist of the seismic retrofit improvements and replacement of the flow meters. The second bid package (Electrical) will consist of improvements to the power distribution system, pump control system, fluid power hydraulic system and lube oil pumps.

The designs must adequately consider construction sequencing since the facility cannot be fully taken out of service while construction is underway. The electrical and controls systems are not well documented and will need some amount of reverse engineering for a complete record of existing conditions. The alignment of existing electrical conduits are also uncertain.

The District has received a Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant for the design and construction of the seismic retrofit of IPS. FEMA must review and approve the final design of the Seismic bid package before the project can move into construction. The Electrical bid package scope is not currently part of this grant funding so it will not need review by FEMA.

The Consultant will assist the District by responding to and incorporating FEMA's comments into the final bid documents. The Consultant shall provide draft responses to FEMA's design comments for the District to review and transmit to FEMA.

The project schedule as shown in the RFP is based on the existing dates provided to FEMA. The Consultant may propose a revised project schedule based on the estimated time to complete the scope of work. The Consultant's proposed project schedule should also account for seismic retrofit design review by the Independent Peer Review for key submittals.

When the project moves into the construction phase the Consultant shall provide engineering services during construction with tasks including but not limited to submittal and RFI review.

D. DELIVERABLES / REPORTS

1. See Exhibit E – Scope of Work.

ANTICIPATED PROJECT MILESTONES

EVENT	DATE
Project Kickoff	April 2025
100% Design Submittal	January 2026*

* Date listed is the current schedule with FEMA. This time frame can be adjusted based on proposal recommendations.

II. CALENDAR OF EVENTS

EVENT	DATE/LOCATION	
RFP Issued	November 19, 2024	
Pre- Proposal Conference (Optional)	December 5, 2024 @ 10:00 AM on Microsoft Teams	Please email jennifer.ku@ebmud.com for a video conference invitation link.
Site Walk (Optional)	December 5, 2024 @ 1:00 PM at MWWTP entrance	Please email jennifer.ku@ebmud.com for meeting details and requirements.
Addendum (if necessary)	December 12, 2024	
Response Due	December 20, 2024 by 4:00 p.m.	
Potential Interviews	January 22, 2025	
Anticipated Board Award Date	April 8, 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. PROPOSAL CONFERENCE AND SITE WALK (OPTIONAL)

A Proposal conference and site walk will be held to:

1. Allow the District to discuss the scope of the project.
2. Provide Proposers an opportunity to view the facilities and site.

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.

All questions deemed to be pertinent by the District will be addressed in Addenda following the site walk/Proposal conference.

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.	<p>Understanding of the Project: RFP responses will be evaluated against the RFP specifications and the questions below:</p> <ol style="list-style-type: none"> 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?
B.	<p>Project Approach: The Proposer will be evaluated to determine the following:</p> <ol style="list-style-type: none"> 1. Effective methods of carrying out the scope of the work 2. Potential for innovative approaches and solutions 3. Has the Proposer demonstrated that they understand the deliverables and schedule the District expects it to provide? 4. Does the project team organization chart demonstrate an effective and cohesive project team?
C.	<p>Relevant Staff Experience: RFP responses will be evaluated against the RFP specifications and the questions below:</p> <ol style="list-style-type: none"> 1. Does the project manager (PM) demonstrate effective leadership skills? Does the PM have experience working with the project team and subconsultants? 2. Do the individuals assigned to the project have experience on similar projects? Do they have the appropriate licensing to perform the work?

	<p>3. Are résumés complete and do they demonstrate backgrounds that would be desirable for individuals engaged in the work the project requires?</p> <p>4. How extensive is the applicable education and experience of the personnel designated to work on the project?</p> <p>5. How well is the proposed team versed in seismic structural evaluation and retrofit design in high seismic hazard zones on similarly complex facilities, and equipment upgrades and electrical improvements?</p>
D.	<p>References (See Exhibit A – RFP Response Packet): References are only performed on the shortlisted Proposers and the score for reference checks is not included in the preliminary short list score. It is the Proposer’s responsibility to verify their References’ are reachable at the provided contact information.</p>
E.	<p>Oral Presentation and Interview: The Proposer will be evaluated based on how well they present their proposal and conduct the interview. The oral interview may consist of standard questions asked of each of the Proposers and specific questions regarding the specific RFP response. Invitations for the interview and presentation are only given to shortlisted Proposers.</p>
F.	<p>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.</p>

C. 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.

D. INVOICING

1. Following the Districts 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 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 Professional Service Provider in an amount not to exceed the negotiated amount(s) which will be referenced in the agreement signed by both parties.

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: Jennifer Ku, Associate Civil Engineer
EBMUD Wastewater Engineering Division
E-Mail: jennifer.ku@ebmud.com
PHONE: (510) 287-1681

FOR INFORMATION ON THE CONTRACT EQUITY PROGRAM:

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

AFTER AWARD:

Attn: Jennifer Ku, Associate Civil Engineer
EBMUD Wastewater Engineering Division
E-Mail: jennifer.ku@ebmud.com
PHONE: 510-287-1681

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 jennifer.ku@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) 287-1681 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, F, or G or qualify their RFP responses. Proposers shall not submit to the District a re-typed or otherwise re-created version of these documents or any other District-provided document except where specified.**

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 IPS Resiliency Design Project

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”
 - EXHIBIT D – IRAN CONTRACTING ACT CERTIFICATION
- **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.**
- **PROPOSORS 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
- Limited Liability Partnership
- Limited Liability Corporation
- Other: _____
- Joint Venture
- Partnership
- Non-Profit / Church

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_____



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. The letter of transmittal should clearly identify the Consultant, the office location(s) where the work would be performed, the project manager, key technical personnel, and subconsultants that will perform the work. The letter should be signed by an individual having authority to execute an agreement with EBMUD.
2. **Statement of Qualifications:** To be considered for this project, your firm must complete the Statement of Qualifications (SOQ) Form in Exhibit A. The purpose of the SOQ is to clearly identify relevant team experience that qualifies your firm for preparation of the work. The SOQ shall include a complete list of all key personnel and proposed subconsultants associated with the RFP who will provide engineering and engineering support services. **The Proposer may use an alternate format to the SOQ Form provided as long as all the requested information is included and presented clearly.**
 - (a) Fill all fields to demonstrate the Proposer’s (Lead Firm) qualifications in regards to RFP Section I.B PROPOSER QUALIFICATIONS.
 - (b) References should have similar scope, complexity, 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 Proposal and to use the information gained from them in the evaluation process.
 - (d) Provide resumes for all key project personnel in an appendix to the proposal.
3. **Description of the Proposed Services:** RFP response shall: (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. **Project Approach:** The proposal should include a clear and complete discussion of how each Task in Exhibit E, as applicable, will be completed and in sufficient detail to present the proposed approach. In general, the project approach should demonstrate:
- Adequate resources and expertise to complete the work.
 - Extensive knowledge of seismic evaluation and retrofit design of structural and non-structural elements comparable to scope of work.
 - Extensive knowledge of equipment upgrades and electrical improvements comparable to the scope of work.
 - Extensive knowledge of construction sequencing and scheduling of construction, in order to keep critical facilities in operation.
 - Extensive experience providing engineering evaluation and design to utilities similar to the District.
 - How Consultant will utilize existing information and data.

The Proposer may break Tasks into subtasks and describe how these subtasks will contribute to the completion of the Task and Deliverable. Clearly identify planned meetings, activities where District involvement is required (inspection, submittal review, etc.), and activities where outside party involvement is required for each Task. Portions of separate Tasks may be performed concurrently. Task and subtask dependency should be reflected in the Proposer's schedule.

Discuss any reasons for significant changes to the scope of work. As part of the proposal, respondents are encouraged to recommend changes or additions to the scope of work that may improve performance, reduce costs, or shorten the project schedule. The proposed scope should include any optional services that the Consultant feels may improve successful completion of the project. Resources under this task are for work that is not within the anticipated scope of services described in this RFP package.

5. **Key Personnel:** RFP response shall include a complete list of all key personnel associated with the RFP. Provide an organizational chart and staffing plan identifying key personnel, related lines of authority and responsibility of those team members who will provide the services described in this RFP. Identify any subconsultant and their roles. 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 educational background; and
 - (d) The person's relevant experience, certifications, and/or merits

Note that proposed key personnel must be included as part of the interview team. Once a contract is awarded any proposed substitution of key personnel must be submitted for approval by the District.

6. **Project Management and Staff:** The proposal should describe how Consultant’s project manager proposes to:

- Coordinate all deliverables. Draft reports are required prior to all final reports.
- Attend and support project management and/or working meetings with EBMUD.
- Manage schedule and budget and report progress.
- Address any performance issues that may arise during the period of the contract.
- Ensure quality assurance/quality control for work.
- Coordinate and work effectively with District Engineering staff.
- Coordinate and work effectively with Independent Peer Reviewer, outside agencies, contractors, and subconsultants.
- See Exhibit E – Scope of Work, Project Management.

Identify the Project Manager and Key Personnel that will lead the project efforts. Indicate any tasks that the Consultant assumes will be completed by EBMUD.

7. **Labor Hours by Task:** Provide a detailed breakdown of labor hours by Task and positions, including subconsultants. The estimate of labor hours presented in the proposal will provide a basis for contract negotiations with the selected Proposers. The Proposer may use the table provided below as a template. The labor hours table may be provided on 11x17 sized pages if needed for legibility.

	Estimated Labor Hours by Task			Total Hours per Task
	Project Manager	Project Engineer	... (roles listed in the table above, add column for each role)	
Task 1				(Sum hours for this task)
Task 2				
... (add a new row for each Task in Exhibit)				
Total Hours per Role	(Sum hours in rows above within this column)	(Sum hours in rows above within this column)	(Sum hours in rows above within this column)	(Total Project Hours)

8. **Schedule:** The RFP response shall include a detailed work plan and schedule. The schedule should indicate how the Proposer will ensure adherence to the timetables for the deliverables outlined in this RFP. Clearly identify the critical path and tasks that can be worked on concurrently. The major milestone deliverable dates must be included (at a minimum) for each Deliverable and Design Submittal in Exhibit E, Scope of Work. The schedule may be provided on a 11x17 sized page if needed for legibility.

9. **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.**

10. **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.

11. **Submittal Length:**

<u>Item</u>	<u>Page Limit</u>
Letter of Transmittal	1
SOQ	9
Proposed Services and Project Approach	5
Project Management and Staff	2
Labor Hours by Task	2
Schedule	1
Exceptions, Clarifications, Amendments	As needed
Contract Equity Program Forms	As needed
Resumes	Max 2 per person
Exhibit A RFP Response Packet Sheets	4
Exhibit D Iran Contracting Act Sheet	1



**Statement of Qualifications (SOQ) Form
RFP For IPS Resiliency Design Project
Engineering Consultant Services**

Proposer Name: _____

IPS Resiliency Design Project, Engineering Consultant Services Statement of Qualifications				
Under Project Team Definition: (1) indicate the estimated portion of the total consulting fee for which each firm is responsible. Total should equal 100%; (2) provide resumes for all key project personnel, and (3) refer to RFP Section I.B for information on minimum qualifications. For qualifying experience, space is provided — add additional rows as needed. This form is available in MS Word by contacting Jennifer Ku (jennifer.ku@ebmud.com).				
Project Team Definition				
	Firm/Primary Location	Expertise (e.g. Condition Assessment, Design, Peer Review)	Est % (\$/\$)	M/WBE (Y/N)
Lead				
Sub				
Sub				
... (insert more rows as needed)				

Lead Firm Key Personnel Qualifications

Name (Title)	Years of Employment at Lead Firm	Total Years of Experience on Relevant Projects	General Role (Discipline)	PE License No. (if applicable)
Project Manager				
Project Engineer				
... (insert more rows as needed)				

Subconsultant Key Personnel Qualifications

Name (Title)	Years of Employment at Lead Firm	Total Years of Experience on Relevant Projects	General Role (Discipline)	PE License No. (if applicable)
... (insert more rows as needed)				

QUALIFYING EXPERIENCE (fill out additional forms as applicable)

Project 1

Project Name:

Subconsultant(s) and Role, if any:

Client Name:

Project Description:

Personnel Involved and Role:

Year Prepared (2014-2024):

Contract Fee:

Lead Firm Contact Name, Title:

Lead Firm Contact Phone, Email:

Client Contact Name, Title:

Contact Phone, Email:

Project 2

Project Name:

Subconsultant(s) and Role, if any:

Client Name:

Project Description:

Personnel Involved and Role:

Year Prepared (2014-2024):

Contract Fee:

Lead Firm Contact Name, Title:

Lead Firm Contact Phone, Email:

Client Contact Name, Title:

Contact Phone, Email:

Project 3

Project Name:

Subconsultant(s) and Role, if any:

Client Name:

Project Description:

Personnel Involved and Role:

Year Prepared (2014-2024):

Contract Fee:

Lead Firm Contact Name, Title:

Lead Firm Contact Phone, Email:

Client Contact Name, Title:

Contact Phone, Email:



EXCEPTIONS, CLARIFICATIONS, AMENDMENTS

RFP For IPS Resiliency Design Project

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.	<i>Proposer takes exception to...</i>

*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 coverage 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. Professional Liability (also known as Errors and Omissions) Insurance Coverage

- A. 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.

B. Minimum Requirements: Professional Liability Insurance with minimum limits as follows:

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

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 claims-made coverage is canceled or non-renewed, and not replaced with another claims-made policies 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.

C. Insurance shall include prior acts coverage sufficient to cover the services under this Agreement.

Verification of Professional Liability (Errors and Omissions) 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 Professional 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. 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: _____

VI. 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 Signature: _____



EXHIBIT C
CONSULTING AND PROFESSIONAL SERVICE
AGREEMENT – SAMPLE TEMPLATE

**CONSULTING AND PROFESSIONAL
SERVICES AGREEMENT FOR
EAST BAY MUNICIPAL UTILITY DISTRICT**

INFLUENT PUMP STATION (IPS) RESILIENCY DESIGN PROJECT

THIS Agreement is made and entered into this _____ day of *(month)*, 2025, by and between **EAST BAY MUNICIPAL UTILITY DISTRICT**, a public entity, hereinafter called “DISTRICT,” and ***(CONTRACTOR'S FULL LEGAL NAME, BOLD, ALL CAPS followed by type of entity [corporation, etc.])***, hereinafter called “CONTRACTOR.”

WITNESSETH

WHEREAS, DISTRICT requires consulting services for electrical design and seismic structural engineering; and

WHEREAS, DISTRICT has completed conceptual and preliminary planning studies; and

WHEREAS, CONTRACTOR has submitted a proposal to provide consulting services for the preparation of design documents and engineering services during construction for the Influent Pump Station Resiliency Design Project and CONTRACTOR represents that it has the experience, licenses, qualifications, staff expertise and where necessary the required Department of Industrial Relations (“DIR”) registration to perform said services in a professional and competent manner; and

WHEREAS, DISTRICT Board of Directors has authorized the contract by Motion Number _____;

NOW, THEREFORE, it is mutually agreed by DISTRICT and CONTRACTOR that for the considerations hereinafter set forth, CONTRACTOR shall provide said services to DISTRICT, as set forth in greater detail herein.

ARTICLE 1 - SCOPE OF WORK

- 1.1. CONTRACTOR agrees to furnish services set forth in Exhibit A, Scope of Services, attached hereto and incorporated herein. The services authorized under this Agreement shall also include all reports, manuals, plans, and specifications as set forth in Exhibit A.

- 1.2. It is understood and agreed that CONTRACTOR has the professional skills necessary to perform the work agreed to be performed under this Agreement, that DISTRICT relies upon the professional skills of CONTRACTOR to do and perform CONTRACTOR's work in a skillful and professional manner, and CONTRACTOR thus agrees to so perform the work. CONTRACTOR represents that it has all the necessary licenses to perform the work and shall maintain them during the term of this Agreement. CONTRACTOR agrees that the work performed under this Agreement shall follow practices usual and customary to the engineering profession and that CONTRACTOR is the engineer in responsible charge of the work for all activities performed under this Agreement. Acceptance by DISTRICT of the work performed under this Agreement does not operate as a release of CONTRACTOR from such professional responsibility for the work performed.
- 1.3. CONTRACTOR agrees to maintain in confidence and not disclose to any person or entity, without DISTRICT's prior written consent, any trade secret or confidential information, knowledge or data relating to the products, process, or operation of 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 this Agreement. The covenants contained in this paragraph shall survive the termination of this Agreement for whatever cause.
- 1.4. The originals of all computations, drawings, designs, graphics, studies, reports, manuals, photographs, videotapes, data, computer files, and other documents prepared or caused to be prepared by CONTRACTOR or its subcontractors in connection with these services shall be delivered to and shall become the exclusive property of DISTRICT. DISTRICT is licensed to utilize these documents for DISTRICT applications on other projects or extensions of this project, at its own risk. CONTRACTOR and its subcontractors may retain and use copies of such documents, with written approval of DISTRICT.
- 1.5. CONTRACTOR is an independent contractor and not an employee of DISTRICT. CONTRACTOR expressly warrants that it will not represent that it is an employee or servant of DISTRICT.
- 1.6. CONTRACTOR is retained to render professional services only and all payments made are compensation solely for such services as it may render and recommendations it may make in carrying out the work.
- 1.7. It is further understood and agreed by the parties hereto that CONTRACTOR in the performance of its obligations hereunder is subject to the control or direction of DISTRICT as to the designation of tasks to be performed, the results to be accomplished by the services hereunder agreed to be rendered and performed, and not the means, methods, or sequence used by CONTRACTOR for accomplishing the results.

- 1.8. If, in the performance of this agreement, any third persons are employed by CONTRACTOR, such person shall be entirely and exclusively under the direction, supervision, and control of CONTRACTOR. All terms of employment, including hours, wages, working conditions, discipline, hiring, and discharging, or any other terms of employment or requirements of law, shall be determined by CONTRACTOR, and DISTRICT shall have no right or authority over such persons or the terms of such employment.
- 1.9. It is further understood and agreed that as an independent contractor and not an employee of DISTRICT, neither CONTRACTOR nor CONTRACTOR's assigned personnel shall have any entitlement as a DISTRICT employee, right to act on behalf of DISTRICT in any capacity whatsoever as agent, nor to bind DISTRICT to any obligation whatsoever. CONTRACTOR shall not be covered by DISTRICT's worker's compensation insurance; nor shall CONTRACTOR be entitled to compensated sick leave, vacation leave, retirement entitlement, participation in group health, dental, life or other insurance programs, or entitled to other fringe benefits payable by DISTRICT to employees of DISTRICT.

ARTICLE 2 - COMPENSATION

- 2.1. For the Scope of Services described in Exhibit A, DISTRICT agrees to pay CONTRACTOR actual costs incurred, subject to a Maximum Cost Ceiling of **\$(dollars)**. Compensation for services shall be in accordance with the method and amounts described in Exhibit B, attached hereto and incorporated herein. CONTRACTOR acknowledges that construction work on public works projects requires DIR registration and is subject to prevailing wage rates and includes work performed during the design and preconstruction phases of construction including, but not limited to, inspection and land surveying work. CONTRACTOR certifies that the proposed cost and pricing data used herein reflect the payment of prevailing wage rates where applicable and are complete, current, and accurate.
- 2.2. In case of changes affecting project scope resulting from new findings, unanticipated conditions, or other conflicts or discrepancies, CONTRACTOR shall promptly notify DISTRICT of the identified changes and advise DISTRICT of the recommended solution. Work shall not be performed on such changes without prior written authorization of DISTRICT.

ARTICLE 3 - NOTICE TO PROCEED

- 3.1. This Agreement shall become effective upon execution of the second signature. CONTRACTOR shall commence work upon receipt of DISTRICT's Notice to Proceed, which shall be in the form of a letter signed by DISTRICT's Project Manager. DISTRICT's Notice to Proceed will authorize the Contracted Services described in Exhibit A with ceiling prices described in ARTICLE 2 - COMPENSATION. No work shall commence until the Notice to Proceed is issued.

- 3.2. DISTRICT may at its option issue a Notice to Proceed for some or all of the Optional Services tasks described in Exhibit A. Compensation for Optional Services shall be in accordance with the method and amounts described in Exhibit B.

ARTICLE 4 - TERMINATION

- 4.1. This Agreement may be terminated by DISTRICT immediately for cause or upon 10 days written notice, without cause, during the performance of the work.
- 4.2. If this Agreement is terminated CONTRACTOR shall be entitled to compensation for services satisfactorily performed to the effective date of termination; provided however, that DISTRICT may condition payment of such compensation upon CONTRACTOR's delivery to DISTRICT of any and all documents, photographs, computer software, videotapes, and other materials provided to CONTRACTOR or prepared by CONTRACTOR for DISTRICT in connection with this Agreement. Payment by DISTRICT for the services satisfactorily performed to the effective date of termination, shall be the sole and exclusive remedy to which CONTRACTOR is entitled in the event of termination of this Agreement and CONTRACTOR shall be entitled to no other compensation or damages and expressly waives same. Termination under this ARTICLE 4 - TERMINATION shall not relieve CONTRACTOR of any warranty obligations or the obligations under 1.4 and 7.1.

ARTICLE 5 -PROJECT MANAGERS

- 5.1. DISTRICT designates Jennifer Ku as its Project Manager, who shall be responsible for administering and interpreting the terms and conditions of this Agreement, for matters relating to CONTRACTOR's performance under this Agreement, and for liaison and coordination between DISTRICT and CONTRACTOR. CONTRACTOR may be requested to assist in such coordinating activities as necessary as part of the services. In the event DISTRICT wishes to make a change in DISTRICT's representative, DISTRICT will notify CONTRACTOR of the change in writing.
- 5.2. CONTRACTOR designates (***CONTRACTOR Project Manager's name***) as its Project Manager, who shall have immediate responsibility for the performance of the work and for all matters relating to performance under this Agreement. Any change in CONTRACTOR's designated personnel or subcontractor shall be subject to approval by the DISTRICT Project Manager.

ARTICLE 6 - CONTRACT EQUITY PROGRAM COMPLIANCE

- 6.1. CONTRACTOR expressly agrees that this Agreement is subject to DISTRICT's Contract Equity Program ("CEP"). CONTRACTOR is familiar with the DISTRICT's CEP and Equal Opportunity Guidelines and has read and understood all of the program requirements. CONTRACTOR understands and agrees to comply with the CEP and all requirements therein, including each of the Good Faith Efforts. CONTRACTOR further

understands and agrees that non-compliance with the CEP requirements may result in termination of this Agreement.

- 6.2. Designated CEP compliance for the duration of this Agreement is listed in Exhibit D, which is attached hereto and incorporated herein. CONTRACTOR shall maintain records of the total amount actually paid to each subcontractor. Any change of CONTRACTOR's listed subcontractors shall be subject to approval by DISTRICT's Project Manager.

ARTICLE 7 - INDEMNIFICATION AND INSURANCE

7.1. 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, expenses, claims, suits, and damages, including attorneys' fees, arising out of or pertaining to, or relating to CONTRACTOR's, its associates', employees', subcontractors', or other agents' negligence, recklessness or willful misconduct in the operation and/or performance under this Agreement.

Where applicable by law, the duty to indemnify, including the cost to defend is limited in accordance with California Civil Code § 2782.8.

7.2. Insurance Requirements

Insurance Requirements are as stated in Exhibit C, Insurance Requirements.

ARTICLE 8 - NOTICES

Any notice which DISTRICT may desire or is required at any time to give or serve CONTRACTOR may be delivered personally, or be sent by United States mail, postage prepaid, addressed to:

(consulting firm's name)

(address)

Attention: *(contact, usually the Contractor's project manager),*

or at such other address as shall have been last furnished in writing by CONTRACTOR to DISTRICT.

Any notice which CONTRACTOR may desire or is required at any time to give or serve upon DISTRICT may be delivered personally at EBMUD, 375 11th Street, Oakland, CA 94607-4240, or be sent by United States mail, postage prepaid, addressed to:

Director of Wastewater Department
P.O. Box 24055
Oakland, CA 94623-1055

or at such other address as shall have been last furnished in writing by DISTRICT to CONTRACTOR.

Such personal delivery or mailing in such manner shall constitute a good, sufficient and lawful notice and service thereof in all such cases.

ARTICLE 9 - MISCELLANEOUS

- 9.1. This Agreement represents the entire understanding of DISTRICT and CONTRACTOR as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered hereunder. This Agreement may only be modified by amendment in writing signed by each party.
- 9.2. This Agreement is to be binding on the successors and assigns of the parties hereto. The services called for herein are deemed unique and CONTRACTOR shall not assign, transfer or otherwise substitute its interest in this Agreement or any of its obligations hereunder without the prior written consent of DISTRICT.
- 9.3. Should any part of this Agreement 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 this Agreement, which shall continue in full force and effect, provided that the remainder of this Agreement can be interpreted to give effect to the intentions of the parties.
- 9.4. Multiple copies of this Agreement may be executed by the parties and the parties agree that the Agreement on file at the DISTRICT is the version of the Agreement that shall take precedence should any differences exist among counterparts of the Agreement.
- 9.5. This Agreement and all matters relating to it shall be governed by the laws of the State of California.
- 9.6. DISTRICT's waiver of the performance of any covenant, condition, obligation, representation, warranty or promise in this Agreement shall not invalidate this Agreement or be deemed a waiver of any other covenant, condition, obligation, representation, warranty or promise. DISTRICT's waiver of the time for performing any act or condition hereunder does not constitute a waiver of the act or condition itself.
- 9.7. There shall be no discrimination in the performance of this Agreement, 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), veteran or military status, family or medical leave status, genetic information, or sexual orientation. CONTRACTOR shall not establish or permit any such practice(s) of discrimination with reference to the Agreement or any part. Any violation of this section shall be deemed to be in material breach of this Agreement.

Contractor 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.

CONTRACTOR shall include the nondiscrimination provisions above in all subcontracts.

9.8. CONTRACTOR affirms that it does not have any financial interest or conflict of interest that would prevent CONTRACTOR from providing unbiased, impartial service to DISTRICT under this Agreement.

ARTICLE 10 - TERM

Unless terminated pursuant to ARTICLE 4 - TERMINATION herein, this Agreement shall expire when all tasks have been completed and final payment has been made by DISTRICT.

IN WITNESS WHEREOF, the parties hereto each herewith subscribe the same in duplicate.

EAST BAY MUNICIPAL UTILITY DISTRICT

By: _____
Name,
Director of Wastewater

Date _____

Approved As To Form

By: _____
for the Office of General Counsel

(CONSULTING FIRM'S NAME, ALL CAPS & BOLD)

By: _____
(Name),
(Title)

Date _____

SAMPLE

EXHIBIT A
SCOPE OF SERVICES

SCOPE OF SERVICES

East Bay Municipal Utility District Influent Pump Station (IPS) Resiliency Design Project

I. CONTRACTOR SERVICES

CONTRACTOR shall provide the following:

Contracted Services

(State each task with associated task number; specifically call out any survey work)

Optional Services

(State each task with associated task number)

II. PROJECT SCHEDULE

(List schedule milestones and completion dates)

SAMPLE

EXHIBIT B
COMPENSATION

COMPENSATION

East Bay Municipal Utility District Influent Pump Station (IPS) Resiliency Design Project

Compensation for services provided in Exhibit A, SCOPE OF SERVICES, shall be in accordance with the methods and specific amounts described in this Exhibit.

1. DISTRICT shall pay CONTRACTOR only the actual costs incurred, subject to the Maximum Cost Ceiling. CONTRACTOR certifies that the cost and pricing information used herein are complete, current and accurate. CONTRACTOR acknowledges that it will expend public funds and hereby agrees to use every appropriate method to contain its fees and minimize costs under this Agreement.
2. Compensation for CONTRACTOR services authorized shall be on a cost reimbursement basis and include Direct Labor, Indirect Costs, Subcontractor Services and Other Direct Costs. Costs to be paid comprise the following:

2.1. Direct Labor

Direct labor costs shall be the total number of hours worked on the job by each employee times the hourly rate for the employee's labor. Hours worked shall be rounded-up to the nearest quarter-hour (0.25) increment. Labor rates shall be based on a normal 8-hour day, 40-hour week.

2.2. Indirect Costs

DISTRICT shall pay CONTRACTOR an overhead expense equal to *(insert overhead rate)* percent of labor costs incurred by CONTRACTOR. CONTRACTOR acknowledges and agrees that this overhead compensation is in lieu of itemized payments for indirect and overhead expenses, which includes, but is not limited to:

- Clerical, word processing and/or accounting work.
- Vehicle usage and mileage between CONTRACTOR's office and DISTRICT offices or work locations within DISTRICT service area. For work outside of DISTRICT's service area, DISTRICT approval to charge for vehicle usage and mileage and other travel expenses must be obtained prior to the expenses being incurred.
- Parking. (DISTRICT does NOT provide parking to CONTRACTOR in the DISTRICT Administration Building, located at 375 11th Street, Oakland, California. CONTRACTOR shall be responsible for parking elsewhere).
- Postage, or for certified or registered mail. Extraordinary postage, overnight delivery, or messenger delivery charges must be approved in advance.
- Routine copying costs for in-house copying.

- Local telephone charges, including cellular phone, modem and telecopier/ FAX charges.
- Office space lease.
- Office supplies.
- Computer equipment.
- Computer usage charges.
- Books, publications and periodicals.
- Insurance.
- Miscellaneous hand tools or equipment rental.
- Safety training, seminars or continuing education.
- Utilities.
- Local meals, transportation or other travel charges.
- Inadequately described or miscellaneous expenses.

The above items are illustrative, rather than exhaustive.

2.3. Subcontractor Services

Subcontractor services shall be billed at cost (plus a *(insert rate)* percent markup).

2.4. Other Direct Costs

Other Direct Costs shall be approved by DISTRICT in advance in writing, and shall be billed at cost, without markup. These costs include, but are not limited to the following:

- 2.4.1. Automobile expenses at *(insert rate)* cents per mile when CONTRACTOR is required to travel outside of DISTRICT's service area. Mileage will NOT be reimbursed for rental car expenses, where the rental agreement specifies unlimited mileage.
- 2.4.2. DISTRICT will pay for necessary and reasonable travel expenses provided the travel is approved in advance by DISTRICT Project Manager, and providing that:
 - Each expense is separately identified (air fare, hotel, rental car) with an amount and date incurred. Confirming documents may be requested.
 - Charged mileage for vehicle mileage shall not exceed the current allowable Internal Revenue Service rate.
 - Air travel is coach or economy rate for refundable tickets. Business and first class rates will not be reimbursed.
 - Lodging accommodations are moderately priced.
 - Meal charges are reasonable. (Reimbursement for meals will only be made in conjunction with out-of-town travel.)
 - Taxis or shuttles are used rather than rental cars whenever cost

effective.

- Rental cars are intermediate or compact class only.

2.5. Budget Amounts

<u>Contracted Services</u>	<u>Optional Services</u>	<u>Maximum Cost Ceiling</u>
\$(dollars)	\$(dollars)	\$(dollars)

The Maximum Cost Ceiling shown above is based upon the cost estimate and labor hours attached hereto as EXHIBIT B-1 – Cost Distribution and EXHIBIT B-2 – Labor Distribution* Costs described above, comprising Direct Labor, Indirect Costs, Subcontractor Services and Other Direct Costs shall be payable up to the Maximum Cost Ceiling as specified herein.

2.6. Billing and Payment

CONTRACTOR shall invoice DISTRICT monthly for the actual costs incurred for work performed during the previous month. Actual costs shall include Direct Labor, Indirect Costs, Subcontractor Services, and Other Direct Costs as specified herein. Actual costs shall be invoiced by task as described in EXHIBIT A – Scope of Services. Invoices shall set forth a description of the actual costs incurred and the services performed, the date the services were performed and the amount of time spent rounded to the nearest quarterly hour increment (0.25) on each date services were performed and by whom. Supporting documentation for the invoice shall be organized to clearly identify the task charged and shall be supported by such copies of invoices, payroll records, and other documents as may be required by DISTRICT to authenticate invoiced costs. Copies of all invoices from any subcontractor(s) and outside service(s) shall be attached. Where CONTRACTOR is required by law to pay prevailing wage rates, supporting documentation for such work shall be in accordance with guidelines set forth below and shall include certified payroll reports. DISTRICT shall pay CONTRACTOR within thirty (30) days, upon receipt of a proper CONTRACTOR invoice, provided that all invoices are accompanied by sufficient cost documentation, and DISTRICT Form P-47 (Subcontractor Payment Report - CEP Participation), to allow the determination of the reasonableness and accuracy of said invoice.

The Maximum Cost Ceiling is in effect for the entire Scope of Services. If the authorized Maximum Cost Ceiling is reached, CONTRACTOR shall complete the agreed-upon work for the authorized Maximum Cost Ceiling. Labor hours may be reallocated within the tasks without renegotiation of the Agreement with written approval from DISTRICT Project Manager in such a manner so as not to exceed the Maximum Cost Ceiling. In no event shall the Maximum Cost Ceiling be

increased unless there is a written amendment of this Agreement.

2.7. Budget Status Reports

For the duration of this Agreement, CONTRACTOR shall provide DISTRICT with monthly budget status reports that include, in tabular or graphical format, for each report period: (1) the original cumulative projected cash flows for the duration of the project (prepared at the start of the project), (2) the actual cash flows for the work completed to date, (3) the current projected cash flows to complete the project, and (4) the earned value (the amount of work actually completed to date compared to the budget expended). Current projected cash flows shall be based on all CONTRACTOR and subcontractor time sheets up to a date within 3 weeks of the date of the budget status report.

2.8. Prevailing Wages and Other Requirements for Construction Inspection, and Construction Related Work During Design and Preconstruction Phases of Construction

2.8.1. 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).

2.8.2. 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 post job site notices, "as prescribed by regulation" (LC § 1771.4).

2.8.3. 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. 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.

2.8.4. 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.

2.8.5. Pursuant to Section 1774 of the Labor Code, 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.

2.8.6. 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 of its subcontractors. 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.

- 2.8.7. General prevailing wage determinations have expiration dates with either a single 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 Maximum Agreement Ceiling will be made for the CONTRACTOR's payment of these predetermined wage modifications.
- 2.8.8. 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 Services. 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.
- 2.8.9. 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.
- 2.8.10. In the event of noncompliance with the requirements of Section 1776 of the Labor Code, 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, 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.

- 2.8.11. Pursuant to the provisions of Sections 1810, et seq. of the Labor Code 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, unless work performed by employees of 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.
- 2.8.12. 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 by 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 the provisions of Labor Code, Sections 1810, et seq.
- 2.8.13. 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 Services; 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.
- 2.8.14. In the performance of a public works contract, 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. In the event CONTRACTOR or any subcontractor willfully fails to comply with this requirement CONTRACTOR or subcontractor shall be subject to the penalties for noncompliance in Labor Code section 1777.7.
- 2.8.15. 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/wpnodb.html>.

(Note: this table is prepared by the Contractor. The following is provided to show format.)

EXHIBIT B-1 – Cost Distribution

**East Bay Municipal Utility District
Influent Pump Station (IPS) Resiliency Design Project**

	CONTRACTOR						Subcontractors**						Total	
	Direct Labor				Indirect Costs	ODCs*	Subcontractor # 1			Subcontractor # 2				
	Project Manager	Project Engineer	Drafting				Project Engineer	Assist. Engineer		Project Engineer	Assist. Engineer			
Hourly Rate (\$/hr.)	(***)	(***)	(***)	Total			(***)	(***)	Total Cost	(***)	(***)	Total Cost		
I. Contracted Services														
Task 1.1:														
Task 1.2:														
Task 2.1:														
Task 2.2:														
Subtotal I.														
II. Optional Services														
Task 3:														
Task 4:														
Subtotal II.														
TOTAL of Subtotals I. & II														

* ODCs = Other Direct Costs.

** Includes any prime contractor markup in subcontractor hourly rates.

*** *Insert hourly rate.*

(Note: this table is prepared by the Contractor. The following is provided to show format.)

EXHIBIT B-2 – Labor Distribution*

**East Bay Municipal Utility District
Influent Pump Station (IPS) Resiliency Design Project**

	CONTRACTOR				Subcontractors***						Total
					Subcontractor # 1			Subcontractor # 2			
	Project Manager	Project Engineer	Drafting	Subtotal	Project Engineer	Assist. Engineer	Subtotal	Project Engineer	Assist. Engineer	Subtotal	
I. Contracted Services											
Task 1.1:											
Task 1.2:											
Task 2.1:											
Task 2.2:											
Subtotal I.											
II. Optional Services											
Task 3:											
Task 4:											
Subtotal II.											
TOTAL											

(Include both Contractor and subcontractor hours. Also, include the percent time commitment for key personnel if a critical issue for success of the project.)*

SAMPLE

EXHIBIT C
INSURANCE REQUIREMENTS

EXHIBIT C

INSURANCE REQUIREMENTS

I. Provisions 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 C ("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 coverage 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.

II. 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: _____

III. 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: _____

IV. 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: _____

V. Professional Liability (also known as Errors and Omissions) Insurance Coverage

A. 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.

B. Minimum Requirements: Professional Liability Insurance with minimum limits as follows:

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

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 claims-made coverage is canceled or non-renewed, and not replaced with another claims-made policies 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.

C. Insurance shall include prior acts coverage sufficient to cover the services under this Agreement.

Verification of Professional Liability (Errors and Omissions) 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 Professional 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: _____

VI. 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: _____

VII. 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 Signature: _____

SAMPLE

EXHIBIT D
CEP COMPLIANCE

CEP COMPLIANCE

**East Bay Municipal Utility District
Influent Pump Station (IPS) Resiliency Design Project**

<u>FIRMS UTILIZED</u>	<u>MINIMUM AMOUNT*</u>	<u>MINIMUM PERCENT**</u>
<i>(Name of Subcontractor's firm)</i>	<i>\$(dollars)</i>	<i>(1 to 99)</i>
<i>(Name of Subcontractor's firm)</i>	<i>\$(dollars)</i>	<i>(1 to 99)</i>
TOTAL	<i>\$(dollars)</i>	<i>(1 to 99)</i>

* Does not include CONTRACTOR's markup.

** Based on a Maximum Cost Ceiling amount of *\$(dollars)*.



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

SCOPE OF WORK

**EAST BAY MUNICIPAL UTILITY DISTRICT
INFLUENT PUMP STATION (IPS) RESILIENCY DESIGN PROJECT
ENGINEERING CONSULTANT SERVICES**

EXHIBIT E - SCOPE OF WORK

GENERAL

The objectives of this project are to perform engineering evaluation and design work, produce construction bid documents for seismic retrofit, equipment upgrades and electrical improvements, and support bidding and construction efforts. The facility to be improved under this project is the Influent Pump Station (IPS) located at the DISTRICT's Main Wastewater Treatment Plant (MWWTP) in Oakland, California.

The DISTRICT has completed the following projects to support seismic safety improvements:

- MWWTP Seismic Evaluation Update Project (2019)
- MWWTP Geotechnical Investigation for Seismic Hazard Mitigation Project (2020)
- MWWTP Seismic Structural Evaluation and Conceptual Design Project (2021)

Evaluation results identified seismic deficiencies and prioritized improvements with a goal of mitigating risks, improving life safety, and reducing operational impacts in the event of a major earthquake. Conceptual and preliminary seismic designs were recently developed for the IPS and are available for use as a starting point for this project. The IPS Resiliency Final Report completed in 2024 provides planning details on the seismic improvements on the IPS building structure, recommended improvements for equipment anchoring and replacement of equipment and electrical improvements within IPS.

This design project will produce two bid packages. The first bid package, herein referred to as the "Seismic bid package," shall include the elements listed below:

- Seismic retrofit of the IPS Facility, including all structural and non-structural elements
- Anchorage of the main IPS pumps and fine screens
- Replacement of flow meters

The second bid package, herein referred to as the "Electrical bid package," shall include the elements listed below:

- Replacement of pump control equipment
- Realignment of IPS power distribution system
- Replacement of the fluid power hydraulic system
- Replacement and relocation of the lube oil pumps

The DISTRICT has been awarded a Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant to help cover design and construction costs of the seismic improvements portion of this project. FEMA approval of the final seismic retrofit design is required before the project can move into construction.

The DISTRICT will be hiring an independent peer reviewer (Peer Reviewer), separate from this contract, to provide an independent peer review of CONSULTANT's design of the seismic improvements.

I. CONSULTANT SERVICES

The CONSULTANT shall complete Tasks 1 through 7 as described below. Task 8 covers optional services.

Task 1: Project Management

The CONSULTANT shall coordinate engineering analysis and design work with the DISTRICT; prepare meeting agenda and minutes; attend meetings; manage quality assurance and quality control (QA/QC); prepare deliverables; and provide documents and invoices as necessary to effectively manage this project. The CONSULTANT shall be responsible for project coordination and communication with the project team, subconsultants, and the DISTRICT to facilitate evaluation and development efforts. The CONSULTANT shall prepare an overall project schedule and update it on a monthly basis. The CONSULTANT shall create and maintain an Issues and Decisions Log, prepare monthly project status reports and invoices, and coordinate deliverables. The CONSULTANT shall ensure that all tasks are completed on time and within budget restrictions. The CONSULTANT shall submit deliverables in draft and final form according to the following submittal requirements, with the exception of preliminary and final design submittals which are specified under their respective tasks.

- Draft Deliverables. The CONSULTANT shall prepare draft documents, each of which shall include the task-required information. The CONSULTANT shall provide an electronic copy (in PDF and its source file format) of each draft document. The CONSULTANT shall allow two weeks for the DISTRICT to review and provide comments on Technical Memoranda, and three weeks for the DISTRICT to review and provide comments on Reports and Detailed Design Submittals.
- Final Deliverables. The CONSULTANT shall prepare final documents, addressing and incorporating comments received from the DISTRICT on the draft versions. The CONSULTANT shall provide two (2) hard copies of each final document. The CONSULTANT shall also include an electronic version (PDF) of each document, and each document in its source file format. All final deliverables shall be stamped and signed by a licensed Architect or Professional Engineer in Civil, Structural, Electrical, Control System or Mechanical registered in the State of California.

Task 1.1: Meetings and Workshops.

The CONSULTANT shall prepare agenda, prepare and coordinate review by DISTRICT of presentation slides, conduct meeting, and document discussion results for all the key meetings and workshops listed below. These meetings do not encompass all the meetings throughout the project by all levels of the project team staff necessary for development and coordination. Meetings will include representatives from various DISTRICT Divisions. All meetings, except the management briefings, shall be scheduled at least two weeks in advance. Management briefings shall be scheduled at least one month in advance.

The following key meetings are anticipated:

- Kick-Off Meeting: The purpose of the meeting is to confirm understanding of scope, review previous relevant work conducted by the DISTRICT, identify outstanding issues, identify potential risks and mitigations, discuss the project schedule, and discuss coordination protocol between the CONSULTANT and the DISTRICT.
- Environmental, Health, Safety and Security Checklist Meeting: This meeting is conducted to discuss all environmental, health and safety issues that may arise in this project and methods of mitigation.
- Drafting Coordination Meetings: The purpose of the meetings is to establish DISTRICT drafting standards, acceptable CAD software to produce drawings, and other DISTRICT drafting requirements. The initial meeting shall be within four (4) weeks of the project's Kick-Off Meeting. The CONSULTANT shall arrange a drafting coordination meeting before each submittal phase listed below. The CONSULTANT'S drafting team shall attend these meetings.
- Basis of Design Meeting: This meeting is to discuss the existing basis of design and any proposed changes the CONSULTANT would like to make to the basis of design.
- 30 Percent Design Workshop: The purpose of this meeting is present the basis for design, design criteria, general approach and layout of improvements, and discuss and solicit input on preliminary design issues. Both bid packages can be discussed at the same workshop or separate workshops can be held.
- 60 Percent Design Submittal
 - User Group Meeting: (Typically one to two weeks after each design submittal.) CONSULTANT shall plan for a separate user group meeting for each bid package.
 - Management Briefing (Typically one to two weeks after user group meetings.)
- 90 Percent Design Submittal
 - User Group Meeting: CONSULTANT shall plan for a separate user group meeting for each bid package.
 - Management Briefing (as needed to review significant change in scope since 60 percent)
- Final Design Submittal

- Management Briefing
- Team Meetings: Meeting agendas and notes will be maintained by the CONSULTANT. Presentation slides are not required for these meetings.
 - Bi-Weekly Design team meetings with the DISTRICT and key members of the CONSULTANT's design team to review the project status, including upcoming submittals, progress of individual team members, action items, new issues and general coordination through completion of the design.
 - Monthly Construction Management team meetings with DISTRICT and key members of the CONSULTANT's design team to coordinate reviews, submittals, and other action items through completion of construction.

Deliverable: For all meetings, the CONSULTANT shall prepare an agenda, presentation slides, meeting minutes following the meeting, and a decision, action item, and risks log. All documents shall be provided in their source file format and PDF format. Meeting minutes shall be submitted to the DISTRICT within one week of the meeting.

Task 1.2: Project Reporting

This task includes management and coordination of project with the DISTRICT and members of the project team. The CONSULTANT shall provide brief project status summaries of services completed, outstanding action items, and budget status with each monthly invoice. A spreadsheet that tracks budget by subtask, including columns for budget, authorized budget, current invoiced amount, invoiced or spent-to date, earned value (i.e. physical spent-to-date), and budget remaining, should be included with the monthly reporting. A Gantt-type project schedule, tracking progress by task, should be included with the monthly reporting.

The CONSULTANT shall manage all internal QA/QC reviews. The CONSULTANT shall also participate in and report on the coordination of independent peer review efforts delineated in Tasks 3 and 4. The independent peer review shall not replace the CONSULTANT's QA/QC requirements.

Deliverables: The CONSULTANT shall submit monthly invoices throughout the project and shall provide timely responses to any questions from DISTRICT regarding content.

Task 2: Data Collection and Review

The CONSULTANT shall assemble and review existing documents, evaluations, and data, provided by the DISTRICT or available from other sources, in support of this effort, including but not limited to:

- Record drawings and specifications
- Geotechnical reports and records
- Previous seismic evaluations and assessments
- Condition Assessment Data and Surveys (structural and nonstructural)

The CONSULTANT shall analyze the information collected and assess the quality, level of detail, and adequacy of the information. The CONSULTANT shall identify where information gaps exist and work with the DISTRICT to try to collect additional information. The CONSULTANT shall make an initial site visit to become familiar with the project site and as needed, to confirm the condition and configuration of existing structural and nonstructural elements. Condition assessment will be limited to visual assessment of accessible areas. The DISTRICT will be present and coordinate access to the facilities.

Deliverable: The CONSULTANT shall reference collected information or organize it in appendices to the TM's and reports required under relevant project tasks.

Task 2.1: Environmental, Health, Safety and Security Compliance Check List

The DISTRICT shall prepare a standard environmental, health, safety and security compliance checklist with support from the CONSULTANT. The CONSULTANT shall attend a mandatory meeting with the DISTRICT Regulatory Compliance Office (RCO) staff to discuss information required for the checklist. The CONSULTANT is not required to provide environmental, health, safety, or security specialists for this effort. Specification requirements as determined by the DISTRICT, following completion of the checklist, shall be included in the detailed design.

Deliverable: The CONSULTANT shall document results of the meeting and discussion of the checklist in the Issues and Decisions log. See Task 1.1 for meeting-related deliverables.

Task 3: Updated Basis of Design Report

The CONSULTANT shall prepare an Updated Basis of Design Report. A basis of design was developed for the preliminary design of the seismic retrofit, equipment upgrades and electrical improvements. The CONSULTANT shall review the existing basis of design and determine if it is acceptable to the CONSULTANT to utilize it for the framework of the CONSULTANT's detailed design. The CONSULTANT shall be confident with the basis of design to adequately make decisions for the detailed design. The updated basis of design shall include the design criteria, identified seismic vulnerabilities, and identified project constraints such as staging, procurement of materials, constructability, etc. The basis of design shall also include consideration of structural and nonstructural modifications such as access modifications, equipment relocation or replacement.

Project objectives and seismic performance objectives were established as part of the basis of design by incorporating current industry standards, codes and guidelines, including but not limited to:

- ASCE 41-23, Seismic Evaluation and Retrofit of Existing Buildings
- ASCE 7-16, Minimum Design Loads for Buildings and Other Structures
- ACI 350.3-20, Seismic Design of Liquid-Containing Concrete Structures
- CBC (California Building Code) 2019
- EBMUD Wastewater Seismic Evaluation and Retrofit Design Criteria Guidelines
- EBMUD Engineering Standard Practice 550.1, Seismic Design Requirements

- FEMA E-74 Reducing the Risks of Nonstructural Earthquake Damage

If the CONSULTANT determines that aspects of the current basis of design should be modified, the CONSULTANT shall consult with the DISTRICT on the changes and come to an agreement on the changes. The independent peer reviewer shall be included in the discussions with the DISTRICT and CONSULTANT on any proposed changes to the seismic design. Any changes shall be documented in the Updated Basis of Design Report. The CONSULTANT shall be responsible for performing any evaluations and analyses required to support the CONSULTANT's updated basis of design.

The DISTRICT will provide any past conceptual and preliminary design information, past related reports on recommendations for structural and nonstructural modifications to the facility, equipment upgrades and electrical improvements, existing background drawings, DISTRICT standard design guidelines, and assist in providing technical information for the development of the basis of design to the CONSULTANT.

Deliverable: The CONSULTANT shall summarize the CONSULTANT'S basis of design in an Updated Basis of Design Report. A draft report will be provided to the DISTRICT for comments. A final report shall incorporate the DISTRICT's comments.

Task 4: Seismic Improvements Detailed Design

This task shall be for the preparation of the seismic bid package. Work on the detailed design shall be as defined and recommended in the Updated Basis of Design Report. The DISTRICT will provide coordinated review comments for draft detailed design submittals in the form of drawing markups, tabulated specification comments, and comments from user group meetings and management briefings. The CONSULTANT shall prepare responses for each review comment, describing the action taken and noting if any follow-up discussion is necessary. Comments and responses shall be logged and tracked in Microsoft Excel spreadsheet format. This log shall be maintained and included with each draft design submittal.

The CONSULTANT shall perform design services that include preparation of any necessary evaluations and modeling, calculations, engineered drawings/plans, and technical specifications required to communicate to the construction contractor the improvements to be constructed and to produce final bid documents. The CONSULTANT shall produce documents under the following requirements:

- **Structural Analysis and Design Software:** The CONSULTANT shall use the latest version of SAP2000, RISA, SAFE or ETABS software to perform structural analysis and design. The DISTRICT may approve the use of other comparable software upon request. Any software models developed shall be submitted electronically to the DISTRICT for future use.
- **Technical Specifications:** The CONSULTANT shall prepare the technical specifications in the Construction Specifications Institute (CSI) master format, and the specifications shall be submitted in both Word document and PDF formats. The DISTRICT will

provide the CONSULTANT with DISTRICT ‘master’ technical specifications, when available, as well as a sample specification Microsoft Word format, for the CONSULTANT to follow. All specifications shall be submitted in the DISTRICT’s standard Microsoft Word format.

- Front-End Specifications (Divisions 00 and 01): The front-end specifications shall be generated by the DISTRICT with assistance from the CONSULTANT to identify project constraints and special procedures. The CONSULTANT shall review and update the front-end specifications to ensure consistency in the contract documents. The CONSULTANT shall provide detailed recommendations for these sections including the bid schedule, work restrictions, special project procedures, safety and environmental requirements, and other topics that would aid in developing the front-end specifications. CONSULTANT shall also verify that any FEMA stipulations required by the Hazard Mitigation Grant are included in the specifications.

The CONSULTANT shall provide markups of the DISTRICT-provided front-end specifications to make these documents specific to the project. The DISTRICT will incorporate the CONSULTANT’s markups and produce the front-end specifications for incorporation into design submittals.

- Drawings: The CONSULTANT shall provide all drafting services for this project. The CONSULTANT shall produce all drawings in AutoCAD format. The CONSULTANT shall comply with EBMUD’s “Wastewater Department Computer Aided Design and Drafting (CADD) Standard Guidelines.” Component or equipment lists shall be prepared using MS Excel software, to comply with the CADD Standard Guidelines. Drawing submittals shall also be submitted in its source format and in PDF format for each design submittal.

The DISTRICT will provide any existing drawing backgrounds as are available to be used in drawing development. The CONSULTANT shall not modify or alter these background master files unless approved by the DISTRICT for the purpose of correcting existing conditions. A previous consulting contract created a 3D model of the IPS building in Autodesk Revit. A copy of the 3D model shall be provided to the CONSULTANT to be used to create drawings for this project.

Any 2D drawings taken from the Revit model shall be provided to the DISTRICT in AutoCAD format. Every element drawn in Revit or CAD shall be geolocated. The DISTRICT will provide the CONSULTANT with Standard drawings showing typical abbreviations, process terms, facility, piping, and equipment naming conventions and layer formatting used by the DISTRICT. The CONSULTANT shall use these standard drawings as a template to prepare drawings associated with this contract. It is the CONSULTANT’s responsibility to translate and conform their digital sheets and model to the DISTRICT’s CAD standards and format. All drawings and software models developed for this project shall be submitted electronically to the DISTRICT for future use in source file format.

- Prior to each design submittal, the CONSULTANT shall perform a QA/QC review of the submittal documents.
- Subsequent to each design submittal, the CONSULTANT shall:
 - Coordinate with the DISTRICT and Peer Reviewer to discuss and resolve DISTRICT, User Group, and Peer Reviewer comments
 - Facilitate User Group Meetings, except following the Final Design Submittal
 - Participate in Management Briefings

Other discipline support for this project shall be provided as follows:

- **Geotechnical Engineering:** The DISTRICT will provide geotechnical information for the project site from available recently produced reports and perform any additional geotechnical engineering necessary to support the final design. The CONSULTANT shall direct any geotechnical inquires and needs to the DISTRICT.
- **Civil, Structural, Architectural, and Mechanical Engineering:** The CONSULTANT shall prepare are required civil, structural, architectural, and mechanical drawings (including plans, sections, and details), and related specifications as needed to cover site changes and related work necessitated by the seismic improvements. The CONSULTANT shall perform potholing as needed to identify utility conflicts with the improvements.
- **Electrical, Instrumentation, and Controls Engineering:** The CONSULTANT shall prepare required electrical and instrumentation plans, sections, details, and related specifications as needed for to cover site changes and related work necessitated by the improvements. Electrical design shall be based on the latest NEC and California Electric Codes and Title 24 energy efficiency compliance requirements. District Electrical systems design shall include power requirements, power distribution at 480 volts and lower, lighting, data and voice communications, fire alarm, atmospheric monitoring system, grounding, and temporary power (as necessary). Conduit routing shall be shown in details with the full path from source to destination. Conduit routing represented in “Home Run” format is not allowed. Control panel drawings shall be drawn to dimension and shall be fully laid-out with details and dimensioned for construction. Typical schematic wiring diagram to represent a similar group of equipment is not allowed. Every piece of equipment shall be drawn out with its own schematic diagram.
- **Surveying:** No new surveying work is anticipated for this project. The CONSULTANT shall use controls and locations from existing record drawings or as otherwise provided by the DISTRICT.

The CONSULTANT shall perform the final detail design work and make submittals under the tasks included below.

Deliverables: For meetings during the final design effort, see Task 1.1 for deliverables. For design submittals, the CONSULTANT shall provide the following deliverables listed in Table 1.

Table 1 – Detailed Design Deliverables

Submittal Deliverable Item	Qty	Include in Design Submittals				Conformed
		30%	50%	90%	Final	
Hard Copies:						
▪ Drawings Half-size (11x17 size)	8		x	x	x	x
▪ Specifications	1		x	x	x	x
▪ Construction Cost Estimate and Schedule	1			x	x	
▪ Comment Log hard copy	1		x	x	x	
▪ Calculations	1			x	x	
Electronic Copies:						
▪ Drawings in source file format and PDF	1	x	x	x	x	x
▪ Specifications in MS Word and PDF	1	x		x	x	x
▪ Construction Cost Estimate & Schedule in PDF	1			x	x	
▪ Comment Log in MS Excel	1	x	x	x	x	
▪ Calculations in PDF	1				x	
▪ Complete submittal in PDF	1	x	x	x	x	x

Task 4.1: 30% Preliminary Design

The CONSULTANT shall utilize the Updated Basis of Design Report to develop design documents to an approximately 30 percent design level of completion. The 30 percent design shall include preliminary improvement layouts, sections, cost estimates, list of drawings, list of specifications, and other details needed to proceed to the next stage of design.

Task 4.2: 60% Detailed Design

The CONSULTANT shall incorporate findings and recommendations from the approved Basis of Design Report into detailed design drawings, specifications, and estimates. Design documents shall be developed to an approximately 60 percent design level of completion including:

- Title page with drawing list
- All of the following drawings to scale and with appropriate dimensions shown
 - Civil site plans and major civil details.
 - Structural plans and details
 - Architectural plans and details (as applicable)
 - Electrical and mechanical relocation plans and details (as applicable)
 - All process and instrumentation diagrams (P&IDs)
 - Temporary and permanent utility relocation plans (as applicable)
- Key technical specifications
- Complete specification list
- 50%-design level construction cost estimate

- Project implementation and construction schedule, including any special constraints and sequencing requirements
- List of required permit applications and permit requirements

Task 4.3: 90% Detailed Design

The CONSULTANT shall incorporate findings and resolutions from all previous comments into 90% submittal of detailed design drawings, specifications, and cost estimates. Design documents shall be developed to an approximately 100 percent design level of completion so that the remainder of work only includes incorporation of District and Peer Reviewer comments. This design submittal shall include:

- All drawings
- All technical specifications
- All front-end specifications which shall incorporate project constraints, construction schedule, specialized inspections and observations, field testing, special warranties, etc.
- 100%-level construction cost estimate
- Updated project implementation and construction schedule, including any special constraints and sequencing requirements
- Permit required documents
- Engineering calculations
- Response to comments log

Task 4.4: Final Detail Design

The CONSULTANT shall incorporate findings and resolutions from all previous comments into the final detailed design drawings, specifications, schedules and cost estimates. At this level, all the documents shall be essentially ready for public bidding of the construction. Only minor changes and additional comments are to be expected at this level of completion. Design documents shall be complete including:

- All final drawings and specifications
- Final construction cost estimate and implementation/construction schedule
- Engineering calculations
- Response to comments log

Task 4.5: Independent Peer Review

The CONSULTANT shall allocate time for an independent peer review throughout the seismic design. The DISTRICT will be hiring an independent peer reviewer (Peer Reviewer), separate from this contract, to provide an independent peer review of CONSULTANT's work delineated in Subtask 4.1 to 4.3. The independent peer review efforts shall be performed in accordance with the industry peer review standards of care and guidelines. The Peer Reviewer shall participate in meetings with the DISTRICT and CONSULTANT as needed to discuss and resolve independent peer review findings. Peer Reviewer shall also attend the following project meetings:

- Kick-off
- Basis of Design Meeting
- 30 Percent Design Workshop
- 60 Percent User Group Meeting
- 90 Percent User Group Meeting
- Final Design User Group Meeting

The aim of the independent peer review is to validate that the design achieves the desired seismic performance objectives. This shall include, but not limited to:

- Ensuring that the appropriated codes and guideline are applied
- Validating of design assumptions and approach to design
- Considering alternative design options
- Confirming selection of materials and constructability

Peer Reviewer shall perform reviews and document findings to address the design adequacy in meeting the seismic performance objectives and including, but not limited to, the items listed above.

The Peer Reviewer shall document findings and issues in a peer review log following each deliverable under Task 4. The peer review log shall be submitted within two weeks of each task deliverable to the CONSULTANT and shall include a rolling peer review log of findings, issues, and resolutions. The CONSULTANT shall prepare responses for each review comment, describing the action taken and noting if any follow-up discussion is necessary.

Task 4.6: FEMA Design Review Assistance

As a requirement of the FEMA Hazard Mitigation Grant that the DISTRICT received for this project, the final design drawings and specifications must be reviewed and approved by FEMA before the project can go out to bid. The DISTRICT shall be responsible for submitting all documents to FEMA for review. The CONSULTANT shall assist the DISTRICT in providing the required design documents, responding to design review questions, and making design revisions. If any revisions are needed, the CONSULTANT shall submit documents in line with the Final Detailed Design submittal requirements for FEMA’s approval.

Task 5: Electrical and Pump Control Drive Improvements Detailed Design

This task shall be for the preparation of the electrical bid package. Work on the detailed design shall be as defined and recommended in the IPS Resiliency Final Project Report and the Updated Basis of Design Report. The DISTRICT will provide coordinated review comments for draft detailed design submittals in the form of drawing markups, tabulated specification comments, and comments from user group meetings and management briefings. The CONSULTANT shall prepare responses for each review comment, describing the action taken and noting if any follow-up discussion is necessary. Comments and responses shall be logged and tracked in

Microsoft Excel spreadsheet format. This log shall be maintained and included with each draft design submittal.

The CONSULTANT shall perform design services that include preparation of any necessary evaluations and modeling, calculations, engineered drawings/plans, and technical specifications required to communicate to the construction contractor the improvements to be constructed and to produce final bid documents. The CONSULTANT shall produce documents under the following requirements:

- **Technical Specifications:** The CONSULTANT shall prepare the technical specifications in the Construction Specifications Institute (CSI) master format, and the specifications shall be submitted in both Word document and PDF formats. The DISTRICT will provide the CONSULTANT with DISTRICT ‘master’ technical specifications, when available, as well as a sample specification Microsoft Word format, for the CONSULTANT to follow. All specifications shall be submitted in the DISTRICT’s standard Microsoft Word format.
- **Front-End Specifications (Divisions 00 and 01):** The front-end specifications shall be generated by the DISTRICT with assistance from the CONSULTANT to identify project constraints and special procedures. The CONSULTANT shall review and update the front-end specifications to ensure consistency in the contract documents. The CONSULTANT shall provide detailed recommendations for these sections including the bid schedule, work restrictions, special project procedures, safety and environmental requirements, and other topics that would aid in developing the front-end specifications.

The CONSULTANT shall provide markups of the DISTRICT-provided front-end specifications to make these documents specific to the project. The DISTRICT will incorporate the CONSULTANT’s markups and produce the front-end specifications for incorporation into design submittals.

- **Drawings:** The CONSULTANT shall provide all drafting services for this project. The CONSULTANT shall comply with EBMUD’s “Wastewater Department Computer Aided Design and Drafting (CADD) Standard Guidelines.” Component or equipment lists shall be prepared using MS Excel software, to comply with the CADD Standard Guidelines. Drawing submittals shall also be submitted in its source format and in PDF format for each design submittal.
- The DISTRICT will provide any existing drawing backgrounds as are available to be used in drawing development. The CONSULTANT shall not modify or alter these background master files unless approved by the DISTRICT for the purpose of correcting existing conditions. A previous consulting contract created a 3D model of the IPS building in Autodesk Revit. A copy of the 3D model shall be provided to the CONSULTANT to be used to create drawings for this project.

Any 2D drawings taken from the Revit model shall be provided to the DISTRICT in AutoCAD format. Every element drawn in Revit or CAD shall be geolocated. The

DISTRICT will provide the CONSULTANT with Standard drawings showing typical abbreviations, process terms, facility, piping, and equipment naming conventions and layer formatting used by the DISTRICT. The CONSULTANT shall use these standard drawings as a template to prepare drawings associated with this contract. It is the CONSULTANT's responsibility to translate and conform their digital sheets and model to the DISTRICT's CAD standards and format. All drawings and software models developed for this project shall be submitted electronically to the DISTRICT for future use in source file format.

- Prior to each design submittal, the CONSULTANT shall perform a QA/QC review of the submittal documents.
- Subsequent to each design submittal, the CONSULTANT shall:
 - Coordinate with the DISTRICT to discuss and resolve DISTRICT, and User Group comments
 - Facilitate User Group Meetings, except following the Final Design Submittal
 - Participate in Management Briefings

Other discipline support for this project shall be provided as follows:

- Geotechnical Engineering: The DISTRICT will provide geotechnical information for the project site from available recently produced reports and perform any additional geotechnical engineering necessary to support the final design. The CONSULTANT shall direct any geotechnical inquires and needs to the DISTRICT.
- Civil, Structural, Architectural, and Mechanical Engineering: The CONSULTANT shall prepare are required civil, structural, architectural and mechanical drawings (including plans, sections, and details), and related specifications as needed to cover site changes and related work necessitated by the improvements. The CONSULTANT shall perform potholing as needed to identify utility conflicts with the improvements.
- Electrical, Instrumentation, and Controls Engineering: The CONSULTANT shall prepare required electrical and instrumentation plans, sections, details, and related specifications as needed for to cover site changes and related work necessitated by the improvements. Electrical design shall be based on the latest NEC and California Electric Codes and Title 24 energy efficiency compliance requirements. District Electrical systems design shall include power requirements, power distribution at 480 volts and lower, lighting, data and voice communications, fire alarm, atmospheric monitoring system, grounding, and temporary power (as necessary). Conduit routing shall be shown in details with the full path from source to destination. Conduit routing represented in "Home Run" format is not allowed. Control panel drawings shall be drawn to dimension and shall be fully laid-out with details and dimensioned for construction. Typical schematic wiring diagram to represent a similar group of equipment is not allowed. Every piece of equipment shall be drawn out with its own schematic diagram.

- Surveying: No new surveying work is anticipated for this project. The CONSULTANT shall use controls and locations from existing record drawings or as otherwise provided by the DISTRICT.

The CONSULTANT shall perform the final detail design work and make submittals under the tasks included below.

Deliverables: For meetings during the final design effort, see Task 1.1 for deliverables. For design submittals, the CONSULTANT shall provide the following deliverables listed in Table 2.

Table 2 – Final Design Deliverables

Submittal Deliverable Item	Qty	Include in Design Submittals				Conformed
		30%	50%	90%	Final	
Hard Copies:						
▪ Drawings Half-size (11x17 size)	8		x	x	x	x
▪ Specifications	1		x	x	x	x
▪ Construction Cost Estimate and Schedule	1			x	x	
▪ Comment Log hard copy	1		x	x	x	
▪ Calculations	1			x	x	
Electronic Copies:						
▪ Drawings in source file format and PDF	1	x	x	x	x	x
▪ Specifications in MS Word and PDF	1	x		x	x	x
▪ Construction Cost Estimate & Schedule in PDF	1			x	x	
▪ Comment Log in MS Excel	1	x	x	x	x	
▪ Calculations in PDF	1				x	
▪ Complete submittal in PDF	1	x	x	x	x	x

Task 5.1: 30% Preliminary Design

The CONSULTANT shall utilize the Updated Basis of Design Report to develop design documents to an approximately 30 percent design level of completion. The 30 percent design shall include preliminary improvement layouts, sections, cost estimates, list of drawings, list of specifications, and other details needed to proceed to the next stage of design.

Task 5.2: 50% Detailed Design

The CONSULTANT shall incorporate findings and recommendations from the approved Preliminary Design Report into detailed design drawings, specifications, and estimates. Design documents shall be developed to an approximately 50 percent design level of completion including:

- Title page with drawing list
- All of the following drawings to scale and with appropriate dimensions shown

- Civil site plans and major civil details.
- Structural plans and details
- Architectural plans and details (as applicable)
- Electrical and mechanical relocation plans and details (as applicable)
- All process and instrumentation diagrams (P&IDs)
- Temporary and permanent utility relocation plans (as applicable)
- Key technical specifications
- Complete specification list
- 60% design level construction cost estimate
- Project implementation and construction schedule, including any special constraints and sequencing requirements
- List of required permit applications and permit requirements

Task 5.3: 90% Detailed Design

The CONSULTANT shall incorporate findings and resolutions from previous comments into 90% detailed design drawings, specifications, and cost estimates. Design documents shall be developed to an approximately 100 percent design level of completion so that the remainder of work only includes incorporation of District comments. This design submittal shall include:

- All drawings
- All technical specifications
- All front-end specifications which shall incorporate project constraints, construction schedule, specialized inspections and observations, field testing, special warranties, etc.
- 100% design level construction cost estimate
- Updated project implementation and construction schedule, including any special constraints and sequencing requirements
- Permit required documents
- Engineering calculations
- Response to comments log

Task 5.4: Final Detail Design

The CONSULTANT shall incorporate findings and resolutions from previous comments into the final detailed design drawings, specifications, schedules and cost estimates. At this level, all the documents shall be essentially ready for public bidding of the construction. Only minor changes and additional comments are to be expected at this level of completion. Design documents shall be 100% complete including:

- All final drawings and specifications
- Final construction cost estimate and implementation/construction schedule
- Engineering calculations
- Response to comments log

Task 6: Design Data and File Management

The CONSULTANT shall organize, describe, and tabulate all documents and files prepared, or caused to be prepared, by the CONSULTANT, and will provide the resulting documentation to the DISTRICT, as stipulated in Article 1.5 of the Agreement. Documents and files include, but are not limited to, drawings, specifications, cost estimates, reports, technical memoranda, collected data and materials, models, and calculations.

Deliverable: The CONSULTANT shall prepare a “Data Management Technical Memorandum” including a summary of the data and files provided. The CONSULTANT shall provide all data and files in both their source file format and PDF format.

Task 7: Bid Period Services

This task includes technical support for the DISTRICT during the bidding process. The CONSULTANT shall attend pre-bid meetings and respond to questions from prospective bidders, as requested by the DISTRICT, and shall prepare meeting notes and addenda as necessary. If addenda are issued during the bid period, the CONSULTANT shall prepare conformed contract documents incorporating addenda, prior to issuance of the construction contractor’s Notice to Proceed. The DISTRICT will print and distribute any addenda produced during the bid period.

The CONSULTANT shall assist the DISTRICT with evaluation of the technical aspects of bids received. The CONSULTANT shall not provide evaluation of legal aspects of any bid irregularities as these require legal expertise. The CONSULTANT shall also review and reply to substitution requests from prospective bidders.

Deliverables: The CONSULTANT shall submit addenda, conformed plans and specifications in both source file and PDF formats.

Task 8: Engineering Services During Construction (ESDC)

The CONSULTANT shall provide ESDC for the project to include the following tasks. Work effort required beyond that indicated below will be negotiated as additional services.

Task 8.1: Issue Resolutions and Reviews

- Requests for Information (RFI) – The CONSULTANT shall issue necessary clarifications, interpretations, and re-design of the Contract Documents.
- Submittal Review – The CONSULTANT shall review (or take other appropriate action in respect of) shop drawings, material and equipment data sheets, engineering calculations, and other data which the construction contractor is required to submit per the Contract Documents.

- Change Order Assistance – The CONSULTANT shall review and consult with the DISTRICT on change orders to the Contract Documents and provide design modifications as applicable.

Deliverables: The CONSULTANT shall submit responses to requests and reviews as appropriate for the orderly completion of the work.

Task 8.2: Meetings and Construction Observations

- Construction Observations – The CONSULTANT shall attend weekly construction meetings to assist with issue resolution and provide periodic site observations of the construction progress for general conformance to the bid document requirements. The CONSULTANT shall not be required to provide detailed analysis of construction activities or work in progress unless specifically directed by the DISTRICT to resolve a specific technical issue. The CONSULTANT shall conduct periodic site visits for observational purposes during construction. The CONSULTANT shall assume making monthly construction site visits after field work begins.
- Schedule Review and Analysis – The Consultant shall assist EBMUD in reviewing the construction contractor’s baseline schedule and subsequent updates and final schedule.

Deliverables: The CONSULTANT shall submit observation notes and photos as appropriate for further review and documentation.

Task 8.4: Startup, Testing, and Commissioning Services

- The CONSULTANT shall provide startup, testing, training, and commissioning services for the new and/or upgraded IPS systems.
- The CONSULTANT shall assist the construction contractor to perform system testing. Assistance will include electrical and control system installation and related work. The Consultant shall also prepare updated standard operating procedures (SOPs) for the facility for DISTRICT Operations staff.
- The CONSULTANT shall assist EBMUD in the review and preparation of operations and maintenance (O&M) manuals submitted by the construction contractor.
- The DISTRICT may engage a third-party commissioning agent to help in commissioning the work.

Deliverable: The CONSULTANT shall submit a complete list of required documents used during startup and commissioning for the new and upgraded equipment installed as part of this project.

Task 8.5: Record Drawings

- Record Drawings – At the completions of the project, the CONSULTANT shall prepare and submit Final Record Drawings to the DISTRICT in both source file and PDF formats. The

CONSULTANT is not responsible for field verification of the construction contractor changes to the drawings.

Deliverables: The CONSULTANT shall submit completed record drawings in both source file and PDF formats.

Task 9: Optional Services

Optional services, if warranted, will be negotiated at a future date at the discretion of the DISTRICT.

Task 9.1 Optional Design Services

Other optional services may include additional engineering or design services identified during the course of this project. At the discretion of the DISTRICT, the following services may be considered, but are not limited to:

- Specialized modeling, evaluation, or design work
- Development of recommended work
- Additional design services
- Additional engineering during construction services
- Construction management support services

Task 9.2 Pre-Purchase Coordination

The DISTRICT may choose to pre-purchase specific equipment with long lead times in order to minimize delays prior to the start of construction. If the DISTRICT proceeds with a pre-purchase, the CONSULTANT shall prepare the specifications and documentation needed to pre-purchase the equipment.

II. PROJECT SCHEDULE (Draft)

Project Kick-off	April 2025
Task 2: Data Collection and Review	April 2025
Task 3: Updated Basis of Design Report	April 2025
Task 4: Seismic Improvements Detailed Design	
Task 4.1: 30% Design Submittal	June 2025
Task 4.2: 60% Design Submittal	July 2025
Task 4.3: 90% Design Submittal	October 2025
Task 4.4: Final Design Submittal	January 2026
Task 4.5: FEMA Design Review Assistance	February – July 2026
Task 5: Equipment Upgrades and Electrical Improvements Detailed Design	
Task 5.1: 30% Design Submittal	June 2025
Task 5.2: 60% Design Submittal	July 2025
Task 5.3: 90% Design Submittal	October 2025
Task 5.4: Final Design Submittal	January 2026
Task 6: Design Data and File Management	July 2026
Task 7: Bid Period Services	July – September 2026
Task 8: Engineering Services During Construction	October 2026 – June 2032
Task 9: Optional Services	TBD

- End Exhibit E -



EXHIBIT F
REFERENCE INFORMATION

Task 8.4 IPS Resiliency Project Report

Document No.: 230323153844_14563a74
Revision: Draft

East Bay Municipal Utility District

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Task 8.4 IPS Resiliency Project Report

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Acronyms and Abbreviations

AACEI	AACEI International
AOR	allowable operating range
ATS	automatic transfer system
BEP	best efficiency point
BSE	basic seismic event defined by ASCE 41
CEQA	California Environmental Quality Act
DCS	distributed control system
EBMUD	East Bay Municipal Utility District
FPHS	fluid power hydraulic system
FRP	fiber-reinforced plastic
HI	Hydraulic Institute
hp	horsepower
HPU	hydraulic power unit
IPS	Influent Pump Station
LCI	load commuted inverter
LOTO	lock out and tag out
MCC	motor control center
MG	million gallons
MGD	million gallons per day
MWWTP	Main Wastewater Treatment Plant
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
O&M	operations and maintenance
PE	polyurethane
PG&E	Pacific Gas and Electric Company
POR	preferred operating region
psi	pound(s) per square inch
PVC	polyvinyl chloride
RWQCB	Regional Water Quality Control Board
SSO	sanitary sewer overflow

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TDH	total dynamic head
TM	technical memorandum
V	volt(s)
VFD	variable-frequency drive

Executive Summary

The East Bay Municipal Utility District (EBMUD) is improving the resiliency of the Influent Pump Station (IPS) for the Main Wastewater Treatment Plant (MWWTP) in Oakland, California. The IPS is a 425-million-gallon-per-day (MGD) pump station that is critical to maintaining flow to the MWWTP. The EBMUD has identified deficiencies with the IPS, including:

- Obsolete load commuted inverter (LCI) pump drives for which replacement parts are difficult to procure and thus impacts reliability of the IPS
- Unnecessarily complicated power feed that impacts the reliability of the IPS
- Old ancillary equipment that are at the end of its useful life and could be a single source of failure for the IPS

A previous seismic evaluation of the IPS concluded that the building was seismically deficient based on EBMUD's current seismic standards and could lead to loss of service or loss of life during an earthquake (Degenkolb 2018). EBMUD has been granted a FEMA Hazard Mitigation Grant to improve the resiliency of the IPS. Jacobs has been contracted to develop this planning-level report to complete an evaluation of the IPS, develop concept designs for improving the resiliency, a plan for implementing the improvements, and identify shutdowns to implement the improvements as follows:

Evaluations:

- Condition assessment of the wet well intake chamber and channels
- Hydraulic evaluation to confirm capacity, determine whether the IPS meets Hydraulic Institute (HI) standards, and whether there are opportunities to improve operations

Resiliency Improvements:

- Structural seismic retrofit
- Power distribution realignment
- Pump control updates to replace the LCIs with variable-frequency drives (VFDs)
- Installation of new ancillary equipment
- Repair of corroded areas of the intake chamber

Implementing the Resiliency Improvements:

Two alternative plans have been developed to implement the work. Each plan includes the following information:

- Detailed construction schedule
- Cost estimate
- Schedule for partial shutdowns
- Lists of work that needs to be completed during the partial shutdown and work that needs to be done to prepare for the shutdown

Construction Shutdowns:

The resiliency improvements will need to be implemented while maintaining operation of the IPS. This will require partial shutdowns of the IPS during the dry season so that:

- The pump channels can be retrofitted
- Pumps and drives can be replaced
- The power feeds can be reconfigured
- Other work can be completed that will require a pump train to be shut down

Cost and Schedule for Implementing the Improvements:

The first implementation plan (Implementation Alternative 1) involves a longer construction schedule intended to reduce risks. The second implementation plan (Implementation Alternative 2) is shorter and requires construction activities to be completed concurrently, which will have a larger impact to operations. Table ES-1 summarizes the construction cost and implementation schedule for both alternatives.

Table ES-1. Schedule and Cost Summary

Implementation Alternative	Construction Duration (years)	Estimated AACEI Class 5 Cost
1	5	\$42,190,000
2	3	\$35,940,000

(AACEI 2020)

A Class 5 estimate is a planning-level estimate with a potential range of -50% to +100%.

The following report summarizes the work completed in this project. The detailed analysis and conceptual designs for each resiliency improvement is further described in TMs and drawings included as Appendices A through K to this report.

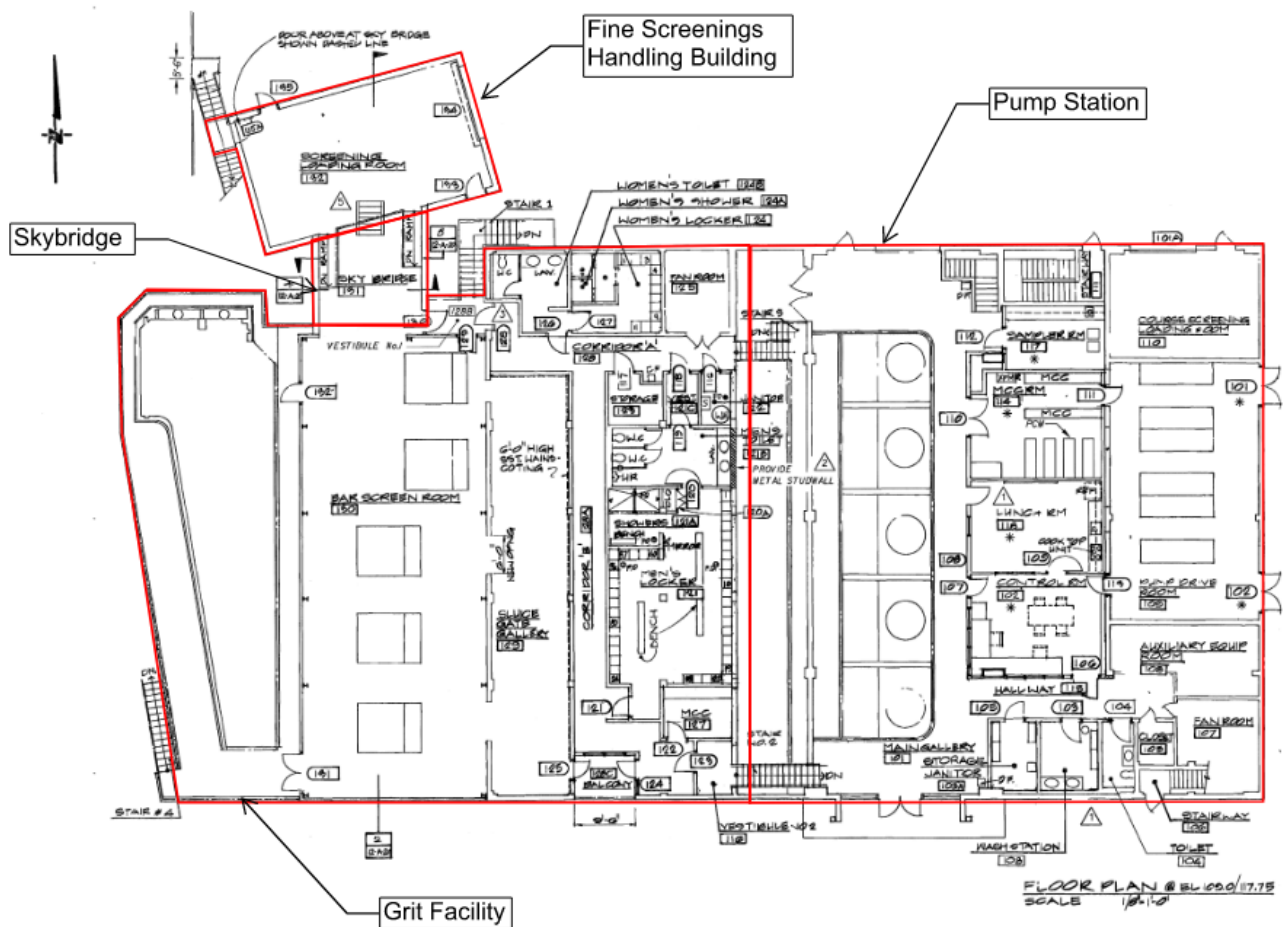
1. Introduction

The East Bay Municipal Utility District (EBMUD) is improving the resiliency of the Influent Pump Station (IPS) for the Main Wastewater Treatment Plant (MWWTP) in Oakland, California. A previous seismic evaluation of the IPS (Degenkolb 2018) concluded that the building was seismically deficient and could lead to loss of service or loss of life during an earthquake. Jacobs has been contracted to develop this planning-level report to improve the resiliency of the IPS. The following report summarizes the work completed for this project. The detailed analysis and conceptual designs for each resiliency improvement are further described in TMs and drawings included as Appendices A through K to this report.

1.1 Background

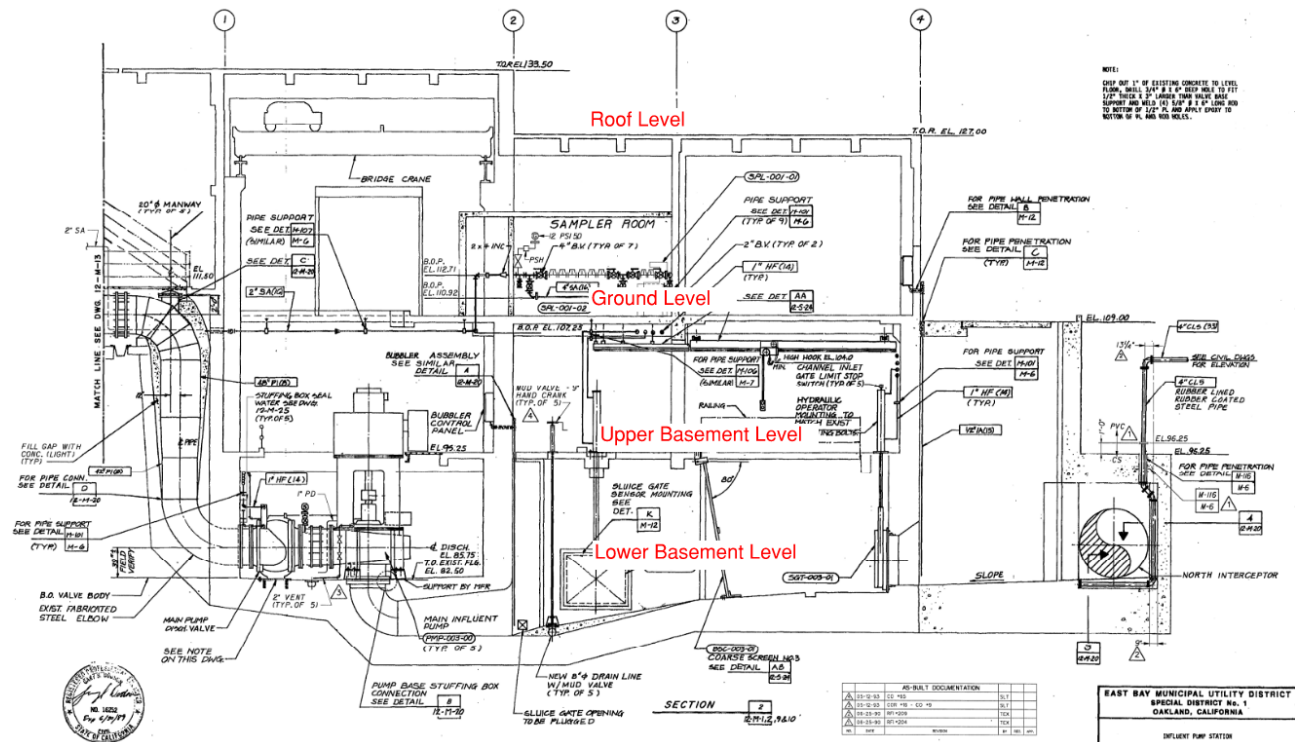
The IPS is a 425-million-gallon-per-day (MGD) pump station that is critical to maintaining flow to the MWWTP. The IPS facility consists of four separate structures separated by structural expansion joints. Figure 1-1 shows the configuration of those structures, and Figure 1-2 shows a section view of the IPS and floor levels.

Figure 1-1. East Bay Municipal Utility District Influent Pump Station Building Layout (red line demarcates boundary between IPS structures).



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Figure 1-2. Section through the Influent Pump Station showing the Floor Levels



Through previous studies, pumping outages, and normal operations of the IPS, EBMUD has identified the following deficiencies that need to be mitigated to improve the resiliency of this critical facility:

- Seismic:** In 2018, a seismic evaluation was completed on the IPS that identified several deficiencies that could lead to loss of life or complete damage to and outage of the IPS. As part of this evaluation, a conceptual design was developed to seismically retrofit the building (Degenkolb 2018). The retrofit concept identified a solution to improve the seismic performance, but how the work would be implemented was beyond the scope of the 2018 work.
- Power Alignment:** The IPS power system is complex and fed by two separate Pacific Gas and Electric Company (PG&E) distribution lines (Bonnarens 2020). These two power sources feed different equipment across each pumping train, such that if either source goes offline, the IPS could lose either all pumping trains or four of the five pumping trains, depending on which source goes offline.
- Pump Controls:** The main IPS pumps are currently controlled with load commuted inverter (LCI) drives installed in the 1990s (EBMUD 2023). The LCI drives are obsolete, and obtaining replacement parts and services can be difficult. There is one backup LCI that can be used to control the pumps; but if more than one LCI requires repairs concurrently, then pumping capacity will be reduced.
- Ancillary Equipment:** The IPS supporting ancillary equipment, such as the fluid power hydraulic system, lube oil pumps, and flow meters are dated, and replacement or repair can be difficult and time consuming (EBMUD 2023). Much of the ancillary equipment is critical to operating the main pumps, and failure of a single component could lead to a complete service outage of the IPS or flooding of the lower basement level of the IPS.

1.2 Objectives

The objective of the IPS Resiliency Project is to develop a facility plan that incorporates the following components:

- Seismic retrofit design
- Power alignment
- Pump controls
- Ancillary equipment improvements

The facility plan addresses synergies, potential construction conflicts, and the approach to implementing the improvements and reducing impacts and risks to operations during construction.

The plan was developed based on the following assumptions:

- The IPS will need to remain in operation during construction of the improvements, which will require close coordination with both Operations and Engineering staff.
- Some of the work will require shutdown of individual pump trains to complete the following activities:
 - Retrofit the pump channels.
 - Replace the LCI drives with variable-frequency drives (VFDs).
 - Reconfigure power feeds.
 - Complete work that can't be completed on an operating pump train.

These partial shutdowns need to be carefully planned and coordinated.

- Facility plan work will need to consider both dry and wet weather period operations:
 - Wet Weather Period – October 15 to April 15: During this period, the IPS cannot be shut down, and work that could reduce pumping capacity cannot take place.
 - Dry Weather Period – April 16 to October 14: During this period, the IPS can be partially shut down. A maximum of two pumping trains can be shut down at a time, and three trains must remain operable at all times.

1.3 Scope

The IPS Resiliency Project includes the following tasks and deliverables, and where they are discussed in this TM:

- **Task 3.1 Investigation and Facility Condition Assessment (Appendix A):** The design team conducted a site visit and met with operations staff to collect information to support the work completed as described herein after. .
- **Task 3.2 Intake Chamber and Channels Assessment Condition Assessment (Appendix B):** A condition assessment of the intake chamber and channels was completed to assess the condition of the concrete and concrete liner. Refer to Section 2.1 of this report and the *Task 3.2 Intake Chamber and Channels Assessment Technical Memorandum* (Jacobs and V&A 2024) for more information.
- **Task 3.3 Hydraulic Evaluation (Appendix C):** A desktop hydraulic flow analysis was completed to evaluate high and low head operating scenarios and conformance with Hydraulic Institute (HI) standards, and to determine whether any changes can be made to improve the efficiency of the pumping strategy. Refer to Section 2.3 of this report and the *Task 3.3 Hydraulic Evaluation Technical Memorandum* (Jacobs and HDR 2024) for more information.
- **Tasks 4.1 - 4.3 Structural Seismic Retrofit (Appendix D):** Several concrete walls will be retrofitted with either a concrete overlay or fiber-reinforced plastic (FRP). The following activities are being completed:
 - Steel brace frames in the Grit Facility are being retrofitted.
 - Additional piles and pile caps are being added outside the building.

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- The roof diaphragm is being strengthened.
- The anchorage for the main IPS pumps and screens are being strengthened.

Refer to the *Task 4.3 IPS Seismic Retrofit Preliminary Design Report* (Jacobs 2024a) for additional details about the seismic retrofit.

- **Task 4.4.1 Seismic Event Service Outage Analysis (Appendix E):** An IPS Seismic Service Outage Analysis was completed to evaluate the damage that could occur to both the IPS and nonstructural elements and estimate the impact to operations. Bypass pumping and temporary equipment were also evaluated to help return the IPS to service during repairs of the IPS after an earthquake. Refer to Section 3.2 of this report and the *Task 4.4.1 Seismic Event Service Outage Analysis Technical Memorandum* (Jacobs 2024b) for additional information.

Task 4.4.2 Environmental Documentation (Appendix F and Appendix G): A cultural resources survey and biologic resources survey for the IPS site were completed to support EBMUD's FEMA Hazard Mitigation Grant. Refer to the *Biological Resources and Habitat Assessment* (Jacobs 2023a) and *Cultural Resources Inventory and Evaluation Report Technical Memorandum* (Jacobs 2023b) for additional information.

- **Tasks 5.1-5.3 Power Distribution Realignment (Appendix H):** The IPS is powered by PG&E's C-line and L-line, and the wiring inside the IPS will be reconfigured so that individual pump trains are powered by only one of these lines. This will allow at least two pump trains to remain in operation if either line goes down. An automatic transfer system (ATS) is also being recommended to switch between the L-line and C-line to maintain full operation of the pump station if either line goes down. Refer to the *Task 5.3 Power Distribution Realignment Conceptual Design Technical Memorandum* (Jacobs 2024c) for additional details about the power realignment.
- **Tasks 6.1-6.3 Pump Controls (Appendix I):** The main IPS pumps are currently controlled by LCIs, which will be replaced with VFDs. As part of this work, the existing pump motors will also be replaced. Refer to the *Task 6.3 Pump Control System Conceptual Design Technical Memorandum* (Jacobs 2024d) for additional details.
- **Tasks 7.1-7.3 Ancillary Systems Analysis (Appendix J):** The scope for this task consisted of evaluating the fluid power hydraulic system (FPHS), flow meters, and lube oil pumps for the main IPS pumps and it was determined that replacement is needed. The discharge sluice gates were also evaluated, and it was concluded that the gates only need minor maintenance to repair coatings. Refer to the *Task 7.3 Ancillary Systems Conceptual Design* technical memorandum (TM) (Jacobs 2024e) for additional details on the ancillary equipment.
- **Task 8.2 Implementation Plan (Appendix K):** Two alternatives for implementing the resiliency improvements were developed. The objectives for these two plans were to identify:
 - Staging
 - Sequencing
 - Impacts to operations
 - Outages
 - Construction schedules
 - Cost estimates for completing the resiliency improvements

Refer to Section 3.6 of this report and the *Task 8.2 Implementation Plan* TM (Jacobs 2024f) for additional details.

2. Organization of the Final Report

The final report is organized to give the reader a high-level summary of the project without overwhelming the reader with details with more details and supporting information included in the appendices. This will allow the reader to efficiently understand the project scope, costs, and schedule for implementing the resiliency improvements. For readers that want more engineering details they should refer to the TMs in Appendices A-K. For readers that are looking to review supporting drawings, calculations, cost estimates, and construction schedules they should refer to the attachments to each appendices. Table 2-1 outlines where the reader can find the appropriate level of detail and supporting information for each task.

Table 2-1. Supporting Information Locations

	Final Report Section 3	Final Report Section 4	Appendices A – K	Attachments to Appendices A - K
High Level Summary of the investigation	X			
High Level Summary of the Resiliency Preliminary Designs		X		
Detailed Information for each evaluation and preliminary design tasks			X	
Detail Cost and Schedule Information				X
Calculations and Supporting Drawings				X

3. Investigations and Facility Condition Assessments Summary

This section summarizes the results of the investigations and facility condition assessments.

3.1 Task 3.2 - Intake Chamber and Channel Condition Assessment

This section summarizes the intake chamber and channel condition assessment. A complete description of the Intake Chamber and Channel Condition Assessment is included in the *IPS Intake Chamber and Channels Assessment (Jacobs and V&A, 2023)*.

3.1.1 Condition Assessment Objectives

The overall objective of the condition assessment was to determine the condition of the existing concrete and liner at the intake chamber, coarse screen channels, and pumping channels. Figures 3-1, 3-2, and 3-3 show the inspection areas. The inspection results will be used to scope repairs and repair costs for inclusion in the IPS Resiliency Project. The inspection was also used to verify that there was no significant deterioration of these structures that needed to be included in the seismic structural evaluation.

Figure 3-1. Plan View Intake Chamber and Coarse Screen Channel Inspection Area

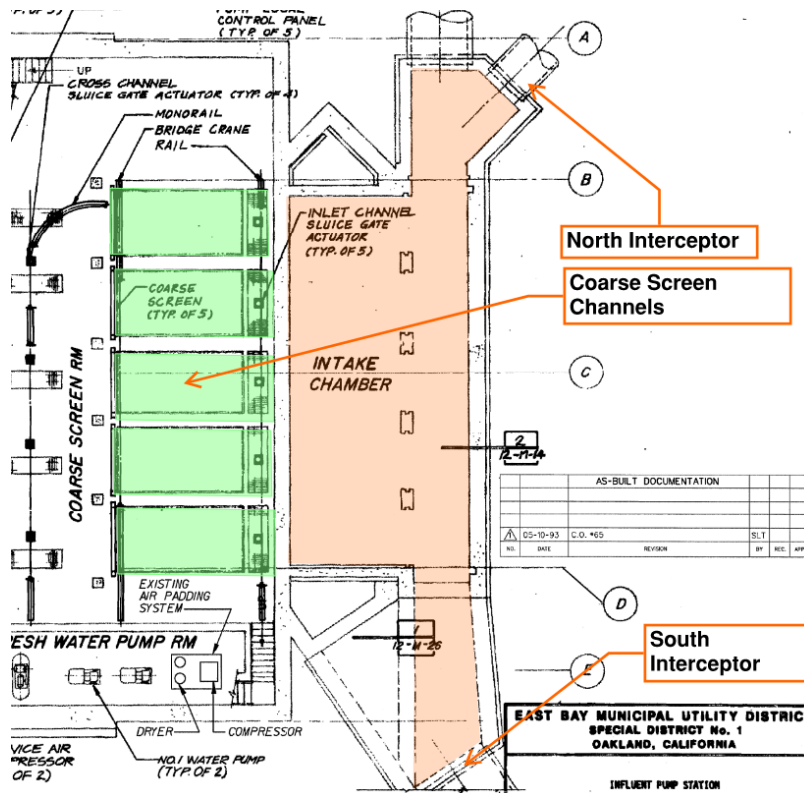


Figure 3-2. Cross Section of the Influent Pump Station showing Inspection Areas of the Pump Station, looking north

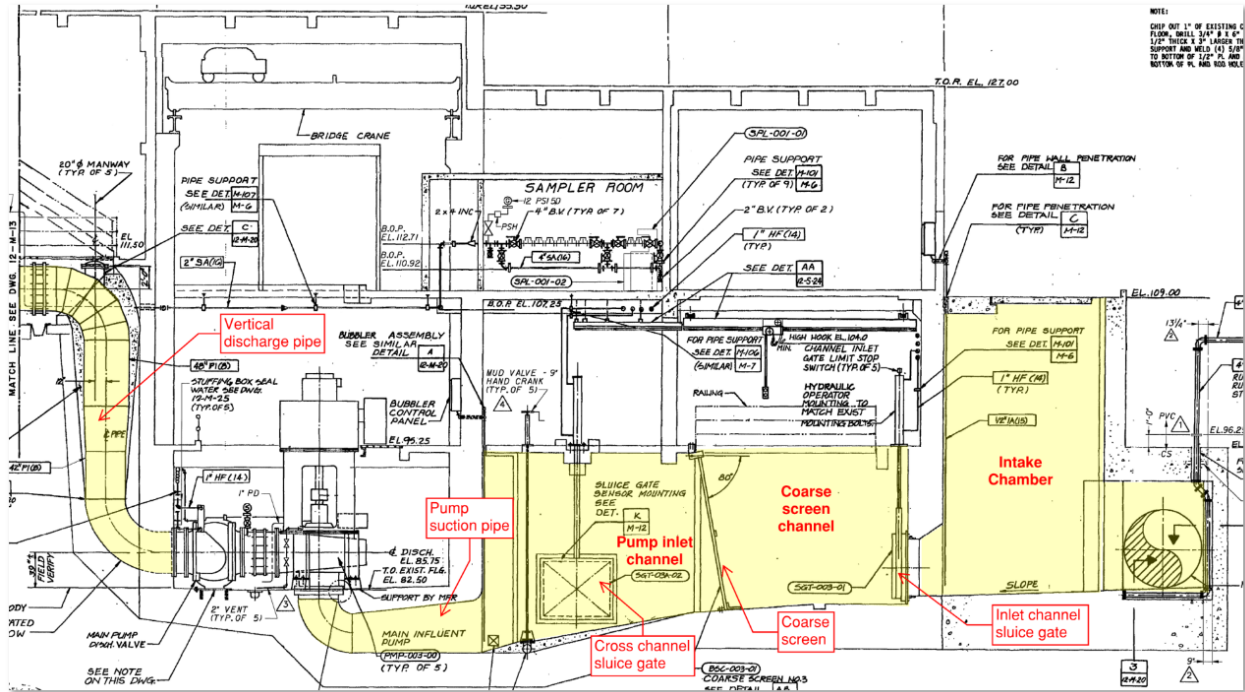
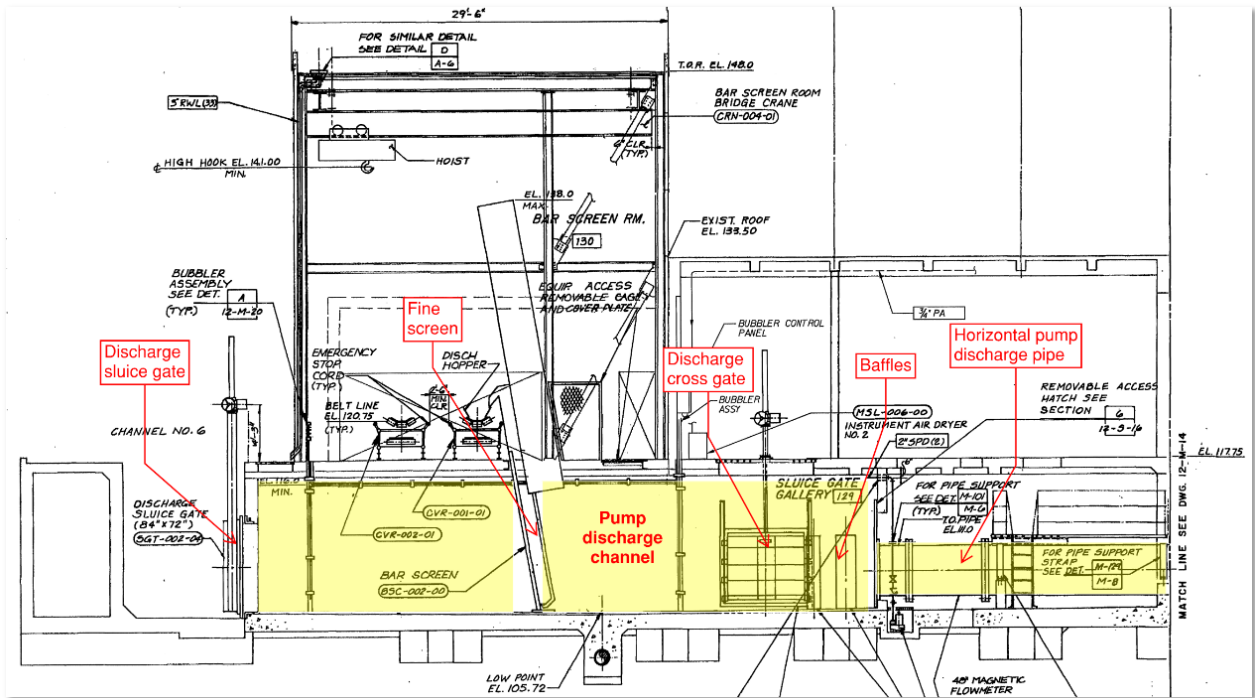


Figure 3-3. Cross Section of the Influent Pump Station showing Inspection Areas of the Grit Facility, looking north



3.1.2 Condition Assessment Summary

Confined space entry assessments in the coarse screen, pump inlet, and pump discharge channels were completed. The condition assessment included visual investigations and concrete surface testing within these channels. Visual and video assessments of the intake chamber were completed. The assessments focused on the corrosion and deterioration conditions, and generally not the operational and functional conditions of these components.

3.1.3 Condition Assessment Results and Recommendations

The structures and linings of the intake chambers and various channels were in good condition overall. Defects and deterioration of various components are attributable to normal wear and tear from years of exposure to wastewater. Repair and rehabilitation of the concrete and linings of the structures, as well as of the various metallic components, should be made to extend the remaining useful life of the IPS. More detailed information on the conclusions and recommendations are presented in the *Task 3.2 Intake Chamber and Channel Condition Assessment* (Jacobs 2023). The recommendations are summarized as follows:

- **Intake Chamber:** Replace the access cover components, and reassess the polyvinyl chloride (PVC) lining for overall performance in 10 years (or sooner if a major shutdown or bypass is performed).
- **Coarse Screen and Pump Inlet Channels:** Remove the existing polyurethane (PE) lining in the channels, and complete the following improvements.
 - Recoat with a 100% solids epoxy lining.
 - Resurface the concrete pump suction pipes.
 - Recoat the suction pipe elbows.
 - Perform various repairs on metallic appurtenances.
- **Pump Discharge Channels:** Complete the following improvements and activities:
 - Perform spot repairs on the existing PVC lining on the walls and ceilings of the channels.
 - Refurbish and repair the fine screen support frames.
 - Perform various repairs and rehabilitation on metallic appurtenances.
 - Replace all access covers and bearing pads.

3.2 Concrete Core Samples and Compressive Strength Testing

Concrete cores were taken from 10 locations inside the IPS to confirm the existing IPS concrete compressive strengths for use in the seismic retrofit preliminary design. Cores were taken from the walls and floors of the SD18 (Pump Station) and SD170 (Grit Facility) project areas. The average strength of the walls and slabs in the coarse screen area was 4,140 pounds per square inch (psi), with 3,400 psi for walls and slabs in the Pump Station. The average strength of the walls in the Grit Facility is 6,500 psi, with 5,220 psi for the slabs. The concrete compressive strengths were used in the seismic preliminary design which is further described in section 4 of this report.

The lab report is included in the *Task 3 Investigations and Facility Condition Assessment* TM (Jacobs 2023), which includes annotated drawings of the core locations.

3.3 Task 3.3 - Hydraulic Evaluation

This section summarizes the hydraulic evaluation which included evaluation of historical flow data, a desktop hydraulics model, and field testing. The historical flow evaluation was used to identify the minimum, average, and peak flows to the IPS. The desktop analysis and field testing were used to confirm pumping capacity and that pumping operations is efficient based on the pump curves, hydraulic institute standards, and manufacturer's recommendations. A complete description of the analysis is included in *Task 3.3 Hydraulic Evaluation Technical Memorandum* (Jacobs and HDR 2024).

3.3.1 Hydraulic Evaluation Objectives

The overall objective of the IPS hydraulics analysis was to review historical flow data to bracket the minimum, average, and peak flows and then use these data to perform a desktop hydraulic analysis using AFT Fathom software (Applied Flow Technology 2024). Thirty years of historical hourly flow data between 1993 and 2022 were evaluated. The evaluation included a review of the following information:

- Data quality
- Consideration of long-term trends
- Statistical analysis of flows, evaluated by year, month, and time of day
- A comparison to precipitation data

The desktop analysis used the flow data to estimate the IPS' current capacity and to determine whether the existing pumps, based on their original pump curves, can convey peak flows based on the current operating levels in the inlet channels.

The analysis also included the predicted performance of one pump to handle low and average flows. Performance flow testing of the existing pumps was performed to define the actual pump capacities based on several factors that can affect flow performance, including:

- Wear of pumps and impellers
- Intake hydraulics
- Condition of discharge piping and valves

The existing IPS intake configuration was evaluated and compared to standards recommended by the Hydraulic Institute (HI) (Hydraulic Institute 2018) to determine whether potential modifications can be implemented to allow the IPS to operate more efficiently and to conform to the HI standards.

3.3.2 Hydraulic Evaluation Summary

Analysis of the last 30 years of flow data identified the following typical flows:

- Minimum: 35 MGD
- Average (1-hour flow): 55 MGD
- Peak (1-hour flow): 390 MGD

These flows are the basis of the hydraulic analysis. The main considerations for the hydraulic analysis of the current pump design are:

- Operating within the pump's preferred operating range (POR) for most of the conditions but always within the allowable operating range (AOR) under short-term conditions
- Operating the IPS efficiently at average flow conditions
- Reliably meeting peak influent flows with multiple pumps operating

The desktop hydraulic analysis only defines the flow that this pump station can theoretically deliver based on calculations and compared to the original factory-certified pump curves. The following parameters were recorded to validate the existing pump curves and allow a comparison between the desktop hydraulic results and actual pump operation:

- Flow
- Suction and discharge pressure
- Pump rotating speed
- Power use
- Wet well level

The following five operating pump configurations were modeled based on variable pump speeds:

- 35 MGD with 1 operating pump (station minimum flow)
- 55 MGD with 1 operating pump (station average flow)
- 85 MGD with 1 operating pump (original single pump design flow)
- 390 MGD with 5 operating pumps (station design peak flow)
- 425 MGD with 5 operating pumps at full speed (station maximum flow)

The results of the model were used to determine the following parameters:

- Flow
- Total dynamic head (TDH)
- Number of pumps in operation
- Percent speed of the pumps in each scenario
- Flow at best efficiency point (BEP) at 100% speed (each pump)
- Percent of BEP (each pump)

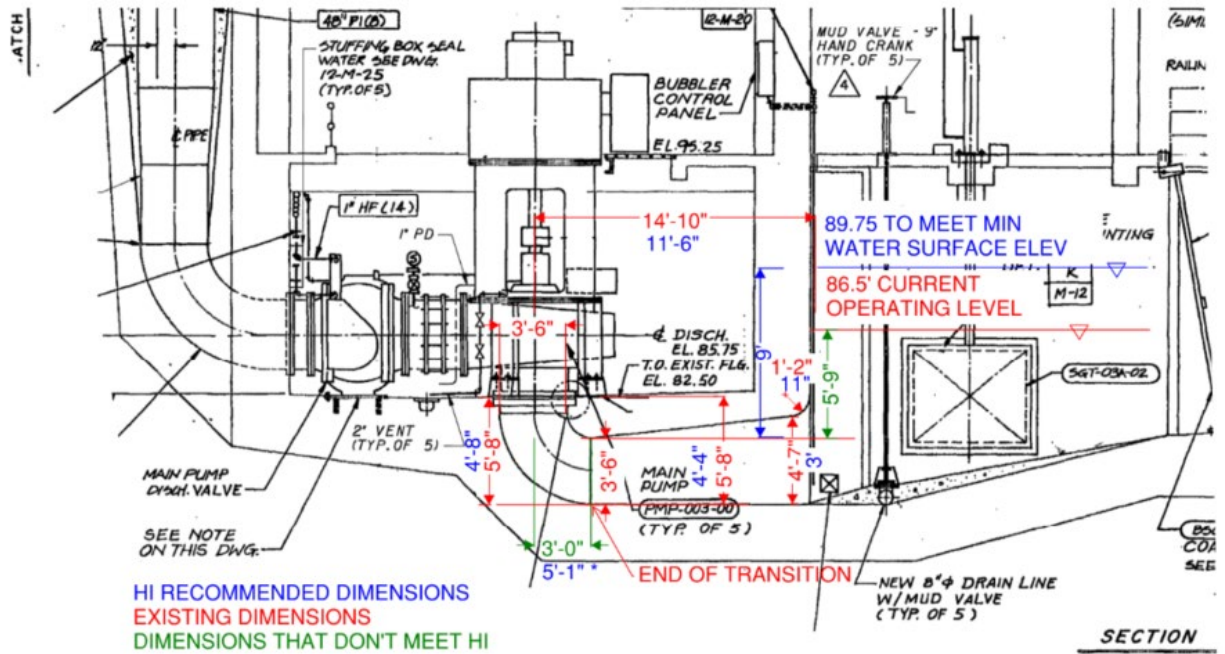
Pump field testing at the IPS was conducted to compare the test data to the desktop hydraulic analysis results and the original pump curve. Due to limitations on obtaining certain field testing data, such as the ability to modulate the discharge ball valve to simulate multiple operating points, and likely inaccuracies of the instrumentation, the results of the field tests do not validate the results of the Fathom hydraulic model.

3.3.3 Conclusions

The hydraulic analysis confirms that the existing pumps can convey the minimum, average, and peak flow conditions at certain intake water elevations using various numbers of pumps operating at certain speeds. Based on the desktop analysis using AFT Fathom, the IPS can currently meet peak flow of 390 MGD with five pumps in operation. However, if one pump is out of service, then four pumps will only be able to meet a flow of 380 MGD at a 92-foot inlet water surface elevation, but only for short periods during a peak event to prevent inefficient operation of the pumps. Flows exceeding 380 MGD and up to 390 MGD can potentially be bypassed to the 11-million-gallon (MG) wet weather storage basin in this scenario.

Most of the design criteria are met or exceeded when comparing the pump intakes configuration to the recommended HI standards. Figure 3-4 shows a comparison between HI-recommended dimensions and existing dimensions. HI recommends that the water surface elevation over the Formed Suction Inlet (FSI) be increased by about 3 feet compared to the normal operating water level typically maintained by EBMUD. Therefore, it is recommended that the normal operating inlet channel water elevation be raised to 89.75 feet to meet this recommendation.

Figure 3-4. Comparison of Hydraulic Institute- recommended Dimensions and Existing Dimensions



4. Resiliency Project Improvements Summary

This section summarizes the IPS Resiliency Project improvements by task.

4.1 Task 4.3 – Structural Seismic Retrofit

4.1.1 Objectives of the Structural Retrofit

The overall objective of the preliminary seismic retrofit design of the Influent Pump Station is to evaluate the existing construction and identify structural deficiencies and retrofit approaches to correct them. To support that objective, structural analyses of the four structures comprising the IPS were conducted at two different seismic hazard levels. Peak ground acceleration levels with mean return periods of 225 and 975 years were used. Two different performance levels were considered: 1) basic objectives to the minimum performance required for wastewater treatment plants as required under the current code, and 2) enhanced objectives with retrofits required to reach the performance expected for existing hospitals and other facilities deemed essential to be functioning after the seismic event. Under each performance level, less damage was allowed under the lower demands of the 225-year seismic hazard. Proposed retrofit approaches were to keep the IPS operable during construction, with a reduced pumping capacity allowed during the dry season between May 1 and September 30 when two trains can be taken out of service for modifications.

4.1.2 Summary of the Structural Retrofit

Drawings and specifications from the IPS construction were used to determine the strengths of the structural components, supplemented with core drilling of walls and floor slabs to verify the existing concrete strength. Ground motion input to the analysis models for determination of the structural demands was comprised of site-specific ground motion response spectra supplied by EBMUD for the selected seismic hazard levels. Acceptance criteria for the structural elements, including walls, slabs, beams, columns, and piles, were determined in accordance with the American Society of Civil Engineers Standard 41-17, *Seismic Evaluation and Retrofit of Existing Buildings*. Those acceptance criteria reflect the level of ductility provided by the structural detailing as determined from the design drawings, some of which do not meet current code standards. That includes maximum tie reinforcing spacing to prevent buckling of the main longitudinal reinforcing bars in columns and around openings in addition to required ductility of steel framing connections. Seismic retrofits were modeled and demands re-evaluated where the retrofits would change the load distribution through the structure, especially new piles and buttress walls added outside of the existing structure.

4.1.3 Conclusions/Recommendations

The structural evaluations determined that the existing IPS structures do not meet either level of performance criteria as existing. Based on the evaluations performed, retrofits including the following are required to achieve acceptable performance:

- Strengthening the roof slabs around existing openings, applying concrete overlays and fiber-reinforced polymer (FRP) strengthening to select walls, applying FRP confinement to select columns to supplement the existing ties, strengthening the braced steel frame connections, columns, and collector beams in the fine screening room.
- Adding anchors and strengthening the connections between precast concrete wall panels and braced frames in the fine screening room, strengthening the pumping channel walls at the cross-gate openings with fabric reinforced cementitious matrix, and placing piles and pile caps around three sides of the existing grit facility. The basic performance criteria result in only minimal cost savings as compared to the enhanced performance criteria.

Based upon the structural analyses, the expansion joints between the IPS and outlet channels to other facilities on site do not have sufficient width to prevent the structures on either side of the joints from pounding into each other. Joint retrofits are required to prevent leakage due to damage to the joints. The joints at the ends of the IPS Skybridge structure are also deficient and require retrofit to provide sufficient movement capacity.

The existing anchors for the main pumps and screens were evaluated for performance. Both were found to be deficient for the selected performance criteria. Modifying equipment anchorages and adding bracing is also required as part of the retrofit design.

4.2 Task 4.4.1 – Seismic Event Service Outage Analysis

This section summarizes the seismic event service outage analyses.

The Seismic Event Service Outage Analysis is required documentation for the Federal Emergency Agency (FEMA) hazard mitigation grant program that the District is applying for to fund portions of this work. Jacobs is assisting the District in preparing the supporting documentation needed for the FEMA hazard mitigation grant.

4.2.1 Seismic Outage Analysis Objectives

A seismic event service outage analysis was performed to estimate damage and determine the outage duration and temporary equipment that could be used to mitigate the outage and restore pumping. A complete description of the outage analysis is included in *Task 4.4.1 Seismic Event Service Outage Analysis* (Jacobs 2024b). The objectives of the seismic event service outage analysis were to:

- Document the potential earthquake damage to the IPS.
- Determine how pumping and screening could be restored after an earthquake.
- Determine how the IPS could be bypassed with a temporary pumping and screening system.
- Determine the duration and costs associated with the post-earthquake repairs and temporary pumping and screening equipment.

4.2.2 Seismic Event Service Outage Analysis Summary

An outage analysis was completed for the following basic seismic events (BSE), BSE-1E, BSE-1N, BSE-2E, and BSE-2N seismic events. As part of this analysis, damage and required repairs to the IPS structure and equipment were estimated. A temporary bypass pumping system scheme was developed that could restore up to 55 MGD capacity, which is equivalent to a dry weather flow event. Because the IPS also provides screening that which could be damaged by an earthquake and be out of service, a concept for temporary screening was also developed.

4.2.3 Seismic Event Service Outage Analysis Conclusions

A significant amount of damage to the existing IPS can be expected given a BSE-1E, BSE-1N, BSE-2E, or BSE-2N seismic event, including:

- Partial collapse of the Grit Facility
- Irreparable damage to the concrete walls in the pumping facility
- Irreparable damage to the foundation piles in the Grit Facility
- Damaged critical mechanical and electrical systems

The duration to restore the IPS to full pumping and screening capacity could be in the range of 2 to 3 years. The service outage could be mitigated by setting up temporary emergency bypass pumping and screening. Bypass pumping could be set up in approximately 3 weeks, and temporary screening could be set up in 8 to 12 months. Table 4-1 summarizes the outage schedule and costs.

Table 4-1. Estimated Outage Schedule and Repair Costs

Seismic Event	Outage Duration (years)	Repair Cost
BSE-1N and BSE-1E	2.5	\$44,890,000
BSE-2N and BSE-2E	2.5 to 3	\$153,780,000

4.3 Task 4.4.2 – Environmental Documentation

Jacobs is assisting the District in putting together supporting documents needed for the IPS and the FEMA Hazard Mitigation Grant. In support of this, Jacobs completed a Cultural Resources Survey and Biological Resources Survey for additional documentation needed to satisfy National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Section 106 of the National Historic Preservation Act (NHPA), and Assembly Bill 52 requirements. A complete description of these surveys are included in Task 4.4.2 IPS Biological Resources Survey Report (Jacobs 2023a) and IPS Cultural Resources Survey Report (Jacobs 2023b)

4.4 Task 5 – Power Distribution Realignment

This section summarizes the power distribution realignment conceptual design. The IPS is powered by the PG&E C-line and L-line, both lines power multiple components of each pumping train. This results in a situation where the IPS would be offline or reduced to one pump train if either the C-line or L-line is offline. The Power Distribution Realignment better organizes the power feed in the IPS to prevent a complete or significant shutdown of the IPS if either PG&E line is offline.

4.4.1 Power Distribution Realignment Objectives

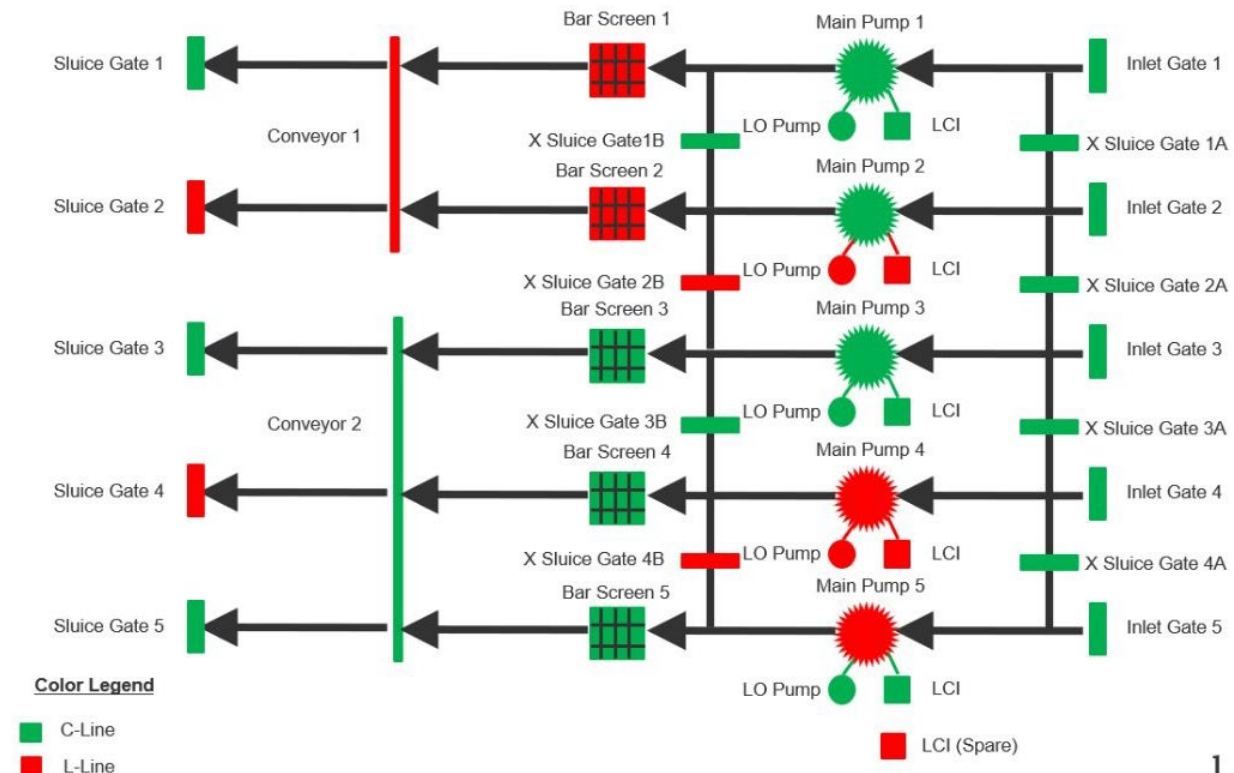
The IPS electrical alignment was analyzed to determine a conceptual design, plan, and schedule to rearrange each piece of equipment for each pumping channel so the IPS is more electrically resilient. A complete description of the analysis is included in *Task 5.3 Power Distribution Realignment Conceptual Design TM* (Jacobs 2024c). The overall objectives for Task 5 are to:

- Identify equipment aligned to the five pump trains in the IPS that are “mis-aligned,” meaning that they are not connected to the same utility power source as the rest of that same train.
- Evaluate the overall system resiliency, and identify other areas where resiliency could be improved.
- Develop a plan for realigning the electrical system to improve resiliency while keeping the IPS and MWWTP operational.

4.4.2 Power Distribution Realignment Summary

Figure 4-1 shows the current alignment of each piece of equipment in the pump trains. Currently, the only pump train that has all pieces of equipment on the same utility source is pumping channel 3 on the C-line. This means that if one utility source goes down, then all or 4 of the 5 pumping trains will not be available for use. The electrical equipment for each train will be re-aligned so if one utility line goes down, at least two trains are operational.

Figure 4-1. East Bay Municipal Utility District Inflow Pump Station Current Electrical Alignment



Notes:

The green and red colors indicate what PG&E line is powering that specific equipment.

The "X" in the title of "X Sluice Gate indicates that this is a cross gate.

The LCI (spare) is colored red on this figure as it is powered by the L-Line when in use.

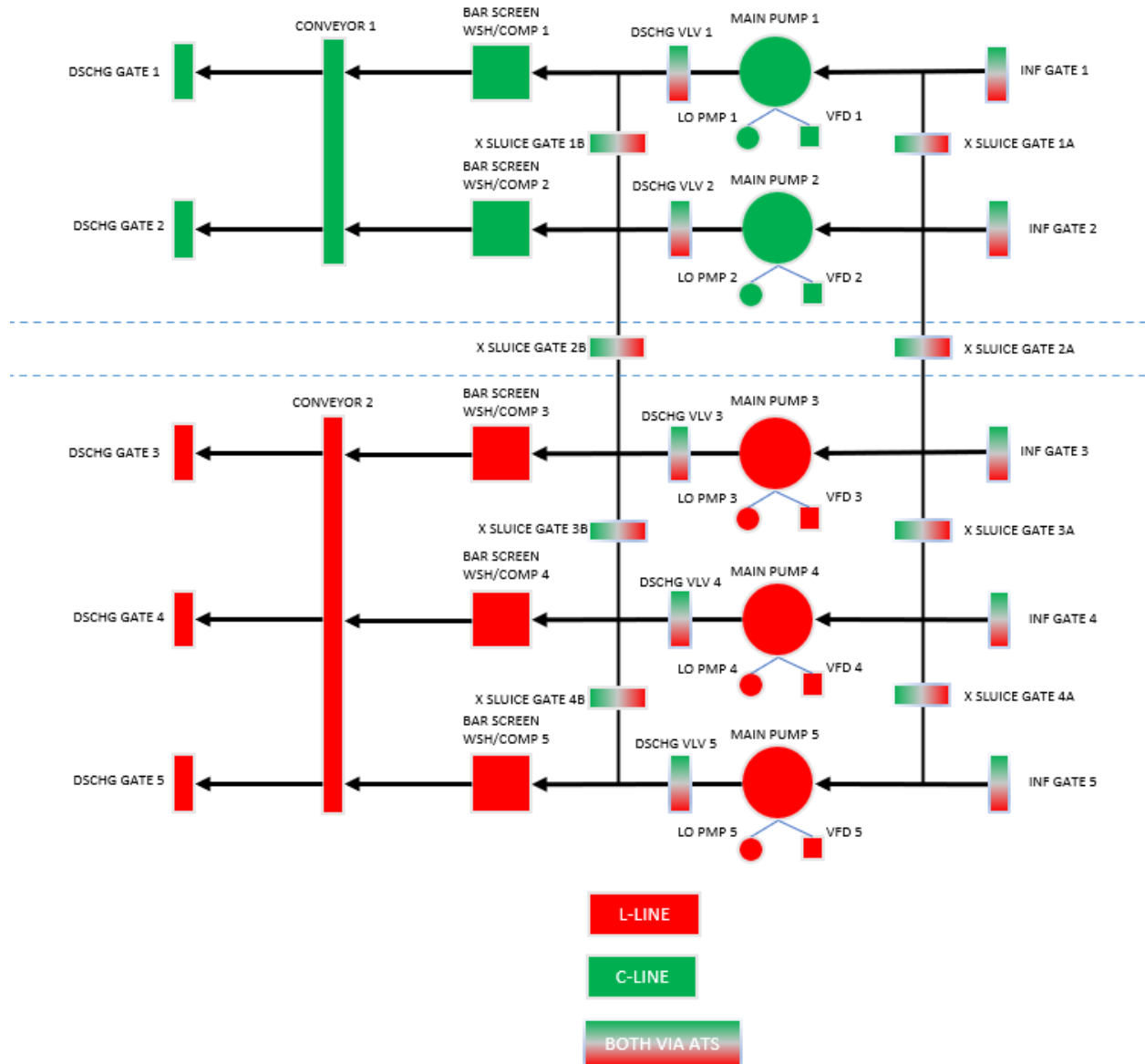
Task 5 was coordinated with Task 6 due to the similarities in the construction work. Task 6 consists of evaluating the pump drives further described in the following section of this report and *Task 6.3 Pump Controls System Conceptual Design* (Jacobs 2024d) evaluated the IPS pump controls and is discussed further in Section 3.4. It was determined that work for Task 5 and Task 6 should occur simultaneously when developing the schedule of work.

Jacobs also coordinated with the master electrical resiliency project being conducted in parallel with this task to determine the best transfer switching strategy as it applies to the IPS. Though the S-1 switchgear is outside of the scope of this project, Jacobs has recommendations to improve the S-1 switchgear.

4.4.3 Power Distribution Realignment Conclusions

Both the electrical realignment and replacing the LCI drives requires an entire pumping channel train to be offline, so both LCI replacement and electrical alignment should occur at the same time to minimize long outages. Figure 4-2 shows how equipment will be aligned after resiliency improvements. With this new configuration, at least two trains will be available if one utility line is out of service.

Figure 4-2. Proposed Electrical Realignment



An ATS will be installed for equipment that needs to be powered by both lines and can be operational at any time if at least one power source is available. To assist in realigning the equipment, new motor control centers (MCCs) that are seismically certified will be installed for the newly aligned equipment; and after all equipment is newly aligned, there is potential for the older MCCs to be removed if all equipment on the corresponding MCC is transferred over. Modifications to the S-1 switchgear include installing the automatic transfer controller within the switchgear. Table 4-2 summarizes which equipment will need to change utility alignment, which equipment will stay with its current alignment, and which equipment will be powered by the new ATS.

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Table 4-2. Equipment Realignment

Equipment	Current Utility Alignment	Future Utility Alignment	Comments
Conveyor 1	L-line	C-line	-
Main Pump 1 and VFD	C-line	C-line	No change
Main Pump 1 Lube Oil Pump	C-line	C-line	No change
Cross Sluice Gate 1B	C-line	C-line and L-line	From the ATS
Bar Screen, Washer, and Compactor 1	L-line	C-line	-
Discharge Valve 1	C-line	C-line	No change
Main Pump 2 and VFD	C-line	C-line	No change
Main Pump 2 Lube Oil Pump	L-line	C-line	-
Cross Sluice Gate 2B	L-line	C-line and L-line	From the ATS
Bar Screen, Washer, and Compactor 2	L-line	C-line	-
Discharge Valve 2	L-line	C-line	-
Conveyor 2	C-line	L-line	-
Main Pump 3 and VFD	C-line	L-line	-
Main Pump 3 Lube Oil Pump	C-line	L-line	-
Cross Sluice Gate 3B	C-line	C-line and L-line	From the ATS
Bar Screen, Washer, and Compactor 3	C-line	L-line	-
Discharge Valve 3	C-line	L-line	-
Main Pump 4 and VFD	L-line	L-line	No change
Main Pump 4 Lube Oil Pump	L-line	L-line	No change
Cross Sluice Gate 4B	L-line	C-line and L-line	From the ATS
Bar Screen, Washer, and Compactor 4	C-line	L-line	-
Discharge Valve 4	L-line	L-line	No change
Main Pump 5 and VFD	L-line	L-line	No change
Main Pump 5 Lube Oil Pump	C-line	L-line	-
Bar Screen, Washer, and Compactor 5	C-line	L-line	-
Discharge Valve 5	C-line	L-line	-
FPHS ^a	C-line	C-line and L-line	From the ATS

^a FPHS controls influent gates 1-5, sluice gates 1A-4A, and discharge valves 1-5.

- = not applicable

FPHS = fluid power hydraulic system

4.5 Task 6 – Pump Controls System Evaluation and Conceptual Design

This section summarizes the pump controls system evaluation and conceptual design.

4.5.1 Pump Controls System Objectives

The current pump controls system was evaluated, and it was determined whether the current LCI drives should be upgraded or the LCIs should be replaced with VFDs. A complete description of the evaluation and conceptual design is included in *Task 6.3 Pump Control System Conceptual Design* TM (Jacobs 2024d). The overall objectives for Task 6 are to:

- Evaluate the existing LCI drives, and determine whether the pump controls should be replaced with updated LCIs or replaced with VFDs.
- Develop a plan and schedule for replacing the existing LCIs while keeping the MWWTP operational.

4.5.2 Pump Controls System Summary

The LCI drive technology was determined to not be supported by manufacturers in the 700-horsepower (hp) range that the existing pumps require; current LCI applications start at around 3,000 hp and greater. Multiple manufacturers recommended VFD technology to replace the existing LCI drives.

Also, this task considered simplifying the electrical system. The existing components were evaluated to determine whether they were required or could be removed. This resulted in an additional evaluation of voltage levels used by the existing LCI system (600 volts [V]) and the potential change to 4,160 V VFDs, which would eliminate the need for the existing transformers and harmonic filtration units.

An evaluation of the existing 700 hp, 600 V synchronous motors was also conducted to determine whether they should be replaced or remain, and if replaced, what type of motor to use.

4.5.3 Pump Controls System Conclusions

It is recommended to replace the existing 600 V LCI drives with 4,160 V VFDs, and remove the existing transformers that feed each drive and the harmonic filtration units required by the use of the LCIs. In addition, it is recommended that the existing 700 hp, 600 V synchronous motors be replaced with 700 hp, 4,160 V induction motors to maintain the same voltage level throughout the system and to eliminate the need for additional components such as transformers and harmonic filters.

Replacing the existing LCI drives with new VFDs and replacing pump motors will follow the same timing and schedule as the Task 5 electrical realignment. Both the electrical realignment and replacing the LCI drives and pump motors requires an entire pumping channel train to be offline, so both scopes of work should occur at the same time to minimize long outages. Table 4-3 summarizes the different options and considerations that resulted in the recommendations.

Table 4-3. Pump Drives and Motors Option Comparison Summary

Options	Cost Comparison Estimate	Benefits	Risks
1. LCI Modernization (Rebuild)	<ul style="list-style-type: none"> \$493,774 for first drive, \$255,750 for remaining 4? drives Total Estimated Cost = \$1,977,090^a 	<ul style="list-style-type: none"> Least invasive option to existing electrical system 	<ul style="list-style-type: none"> Existing transformers are not operating reliably. Reuse of 30 year old motors LCIs are not commonly manufactured anymore so it is difficult to get parts, and would be required to power an aging system (transformers and motors)
2. VFD Drives with Transformers, Retain Existing Motors	<ul style="list-style-type: none"> VFD Drive: \$200,000 each, plus \$50,000 per drive for synchronization equipment to interface with synchronous motors New Transformer: \$71,000 each Note: Estimated 120-week lead time Total Equipment Cost = \$1,605,000 New Duct Bank = \$150,000 Total Estimated Costs = \$7,500,000 Class 5 Cost Range \$3,700,000 to \$14,900,000^b 	<ul style="list-style-type: none"> LCI drives are replaced with new VFDs Gives ability to replace motors in the future but would require some rebuild of the VFDs 	<ul style="list-style-type: none"> Reuse of 30-year-old motors Transformers would be located outside the IPS would require more site work and new duct bank Most invasive option to existing system ^c Future replacement of the pump motors would require the new VFDs to be modified
3. VFD Drives with MV Motors (Selected Option)	<ul style="list-style-type: none"> VFD Drive: \$200,000 each MV Motor: \$380,000 each Total Equipment Cost = \$2,900,000^d Total Estimated Costs = \$9,200,000 Class 5 Cost Range \$4,610,000 to \$18,440,000 	<ul style="list-style-type: none"> Fully replaced system, reducing electrical components and aging equipment Most cost-effective approach if the motors are going to be replaced in the future 	<ul style="list-style-type: none"> Highest initial cost option, though lower cost if motors are to be replaced in the future

^a Modernization of LCI cost is based on the 2022 bid for modernizing the LCIs at the EBMUD MWWTP Effluent Pump Station. Cost in this table has been escalated by 11.7% for a 2026 construction year (consistent with the other alternatives).

^b Assumes installation, demolition, and indirect costs are similar for options 2 and 3. Primary difference in project cost is the equipment cost.

^c This option would require new transformers located to the west of the building under the concrete canopy. This will require use of the existing conduit between the IPS and this electrical equipment plus an additional duct bank and conduit from the new transformers back to the IPS. This construction cost for the new duct bank is anticipated to be more than the installation and demolition work for replacing the motors shown in Option 3.

^d Installation, associated demolition, and Contractor markup costs are shown in the cost estimate in Appendix I. Note that the installation costs, associated demolition costs, and Contractor markups are assumed to be approximately similar for options 2 and 3. Exclusions to the cost are shown in part 4 of the basis of estimate in the Task 6 Tech Memo

4.6 Task 7 – Ancillary Equipment Evaluation

This section summarizes the ancillary equipment evaluation. A complete description of the ancillary equipment evaluation is included in *Task 7.3 Ancillary Systems Conceptual Design TM* (Jacobs 2024e).

4.6.1 Ancillary Equipment Evaluation Objectives

The overall objective of the Task 7.3 Ancillary Systems Conceptual Design Technical Memorandum (Jacobs 2024e) was to review current operation performance and present conceptual design alternatives for the following four systems:

- Fluid power hydraulic system (FPHS)
- Discharge sluice gates
- Flow meters

- Lube oil pump system

Review of these ancillary systems included assessment of vulnerabilities and impacts from historical and future emergencies such as power failures, such that effective solutions can be developed. Multiple alternatives are presented for each system with varying levels of risk mitigation, from maintaining current conditions to minor equipment modifications to full system replacement. The alternative analyses and recommendations include conceptual-level construction cost estimates and consider construction impacts, such as staging, scheduling, and daily operations.

4.6.2 Ancillary Equipment Evaluation Summary

Each of the four ancillary systems were evaluated and assessed, starting with an IPS site visit and interviews of Operations and Maintenance staff. Equipment literature, historical performance data, and maintenance documentation were reviewed to understand ancillary system operations, as well as the extent of past failures and current staff workarounds. System vulnerabilities were assessed, with a focus on the following factors:

- Mechanical
- Electrical
- Controls
- Maintenance
- Accessibility
- Safety

Conceptual-level material and installation costs were estimated with input from equipment manufacturers and suppliers, as well as installation information when requested. Further investigation was conducted for lube oil pump pressure requirements, influent wet well flow level evaluation, and a risk to benefit analysis matrix was developed to guide decision making, as further discussed in the Task 7.3 Ancillary Systems Conceptual Design Technical Memorandum.

The alternative analyses of the ancillary systems each included three main options:

1. *Do Nothing*: This alternative would maintain the current conditions and would not contribute capital costs or constructability considerations to any future IPS upgrades. Ancillary system vulnerabilities, including safety and regulatory risks, would remain without any mitigation.
2. *Rehabilitation*: This alternative includes recommendations such as minimal corrections, minor equipment upgrades, and increased maintenance to reduce failures and workarounds. While a limited number of elements could be effectively replaced separately from the whole system, there is an inherent risk of new and old components not fully integrating and potentially causing further issues in some ancillary systems.
3. *Replacement*: To achieve the highest risk mitigation a full replacement of each ancillary system was considered. For some systems, multiple replacement options were presented, comparing different available technologies, system configurations, estimated costs, and construction impacts. Final recommendations consider known risks and potential benefits.

4.6.3 Conclusions

Evaluation of the four IPS ancillary systems reveal that many of the O&M issues could be eliminated or significantly reduced by replacing aging equipment components, implementing more robust control systems, and providing reliable backup power.

Full replacement of the 33-year-old FPHS is recommended. A two hydraulic power unit (HPU) system would lower the risk of experiencing another catastrophic failure similar to the 2017 and 2020 SSOs. The two-HPU alternative allows the IPS and MWWTP to operate at limited capacity if one HPU experiences failure, giving IPS staff enough time to diagnose and conduct repairs for the failed HPU.

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A full FPHS replacement would also resolve current equipment issues, including leaking hydraulic lines and sticky solenoid valves, and ease concerns regarding potential failures caused by equipment age. Table 4-4 summarizes the risk, cost, and benefit analysis for each alternative for the FPHS and the considerations that went into choosing the recommended option.

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Table 4-4. Fluid Power Hydraulic System Risk-Benefit Analysis

Alternative	Benefit	Risk	Cost (\$)
<i>Do Nothing</i>	Lowest-cost Option		
		O&M costs caused by: <ul style="list-style-type: none"> ▪ Oil leaks ▪ Failing fuses ▪ Solenoid valve maintenance and replacement ▪ Increased staff time to diagnose and conduct repairs 	Unknown
		Lack of accessibility equipment, such as isolation valves, limits preventive maintenance procedures, which may result in continued FPHS failures.	Unknown
		Equipment is at the end of its life and will likely continue to have issues and need to be replaced.	Unknown
		May require root cause analysis and reporting to the RWQCB.	\$20,000 per event
		If the FPHS fails, there is risk of an SSO and significant fines from the RWQCB.	\$25,000 per event
		Additional SSOs will damage the EBMUD's reputation and relationship with the RWQCB.	Unknown
		Additional SSOs will damage the EBMUD's relationship with the community and environmental groups.	Unknown
		Cleanup costs required every time the FPHS fails.	\$10,000 per event
		Risk to EBMUD staff, including Operators and Maintenance Workers: existing system is not easily refilled with oil and requires heavy and awkward lifting of oil drums and buckets, which results in increased risk of oil spills and work injuries.	Unknown
		Because of the inadequacy of the existing accumulators, the FPHS requires unconventional operations to fully operate gates and valves. This process is unreliable and likely results in heightened equipment deterioration.	Unknown
		LOTO is currently a makeshift system to protect staff during maintenance and repair activities and does not properly isolate the equipment.	Unknown
		Damaged equipment if the IPS floods.	\$100,000 to \$2,000,000
Do Nothing Estimated Cost per Failure Event			\$155,000 to \$2,055,000 + impact to stakeholders and fines may increase if EBMUD does not address SSOs.

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Alternative	Benefit	Risk	Cost (\$)
<i>FPHS Rehabilitation</i>	Lower-cost Option		
		The rehabilitation option includes the material cost of a temporary FPHS required during implementation. This does not include labor costs.	\$600,000
		Costs for replacement components would be determined after completion of a full condition assessment.	Unknown
		Improvements to the FPHS would be limited and may not completely reduce the risk of future failures. Much of the FPHS equipment and piping is at the end of its expected life and could continue to have issues.	Unknown
		Temporary FPHS system, new replacement components, and old equipment may not integrate optimally during the rehabilitation process.	Unknown
		If the FPHS fails, there is risk of an SSO and significant fines from the RWQCB.	\$25,000 per event
		Additional SSOs will damage the EBMUD's reputation and relationship with the RWQCB.	Unknown
		Additional SSOs will damage the EBMUD's relationship with the community and environmental groups.	Unknown
		LOTO is currently a makeshift system to protect staff during maintenance activities and does not properly isolate the equipment.	Unknown
		During rehabilitation construction, the existing FPHS would need to be taken offline. This would leave the IPS vulnerable, and it would have to rely on temporary provisions for an extended period of time.	Unknown
		Additional issues with the existing equipment discovered during construction may need to be fixed, resulting in cost and schedule change orders.	Unknown
Cleanup costs required if the FPHS fails.	\$10,000		
FPHS Rehabilitation Estimated Cost			\$635,000

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Alternative	Benefit	Risk	Cost (\$)
<i>FPHS Replacement</i>	<ul style="list-style-type: none"> ▪ Replaces aging equipment (at the end of its useful life) ▪ Meets EBMUD's resiliency goals ▪ Minimizes downtime during construction 	Highest-cost Option	
	Reduces O&M costs.		
	Reduces risks of future failures that could result in SSOs, fines, and damaged reputation.		
	There would be a significant increase in system redundancy with two separate FPHS: 1. Pump Trains 1 and 2 2. Pump Trains 3, 4, and 5		
	Minimizes risks during construction because the existing system can remain in operation during construction, unlike the alternative to rehabilitate the existing FPHS, which takes the system offline.		
	Provides a safe and complete method to LOTO the equipment.		
	Provides a safer procedure to refill the system with oil.		
FPHS Replacement Estimated Cost			\$3,000,000

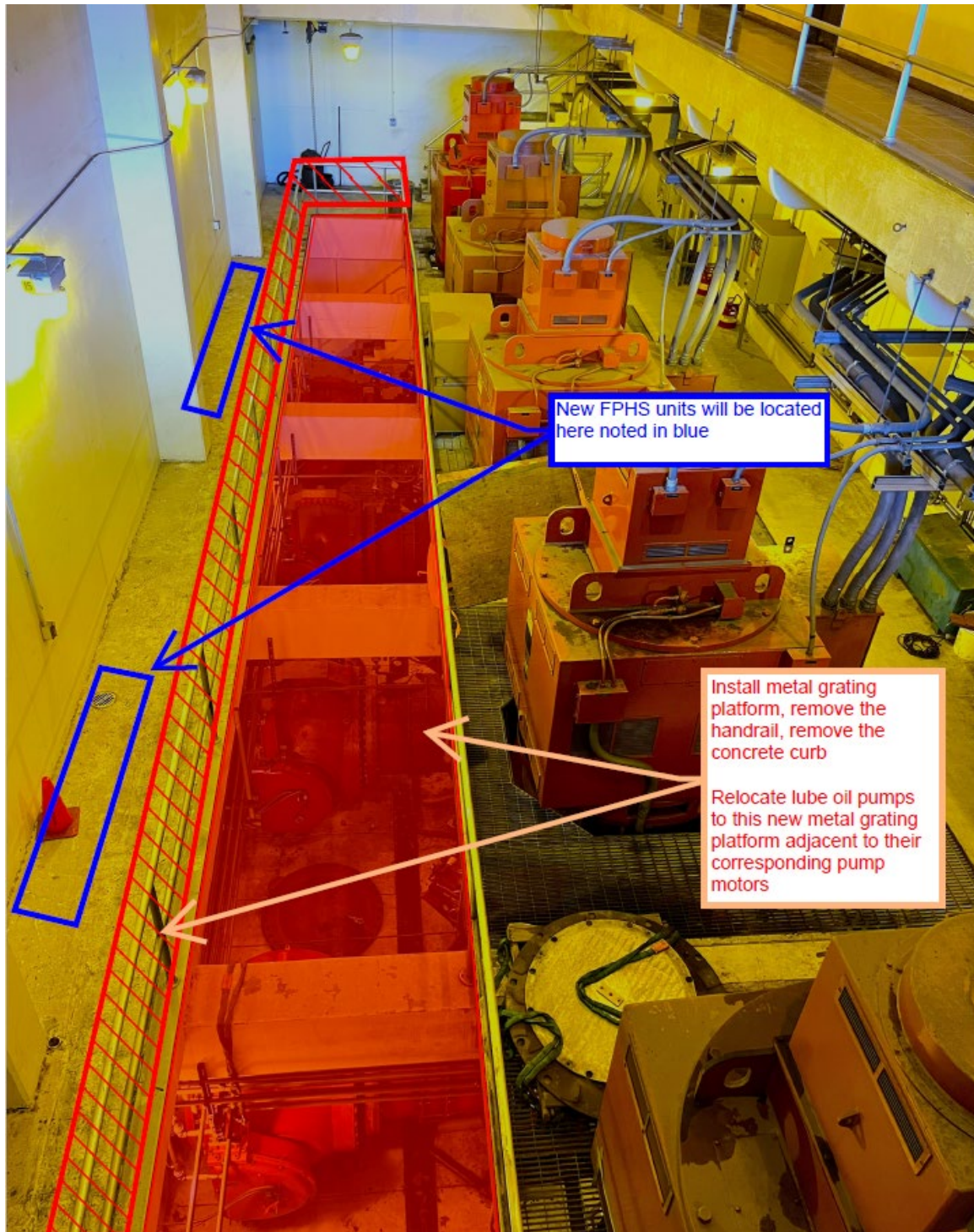
LOTO = lock out and tag out

O&M = operations and maintenance

RWQCB = Regional Water Quality Control Board

The new FPHS will need to be fully installed, connected, and commissioned before demolishing the existing FPHS to keep the IPS operational during construction. The new FPHS will need to be relocated to a different area because the current FPHS location does not have enough space for two new HPU's for the new system. The new FPHS will be relocated with the new lube oil pumps, as shown on Figure 4-3.

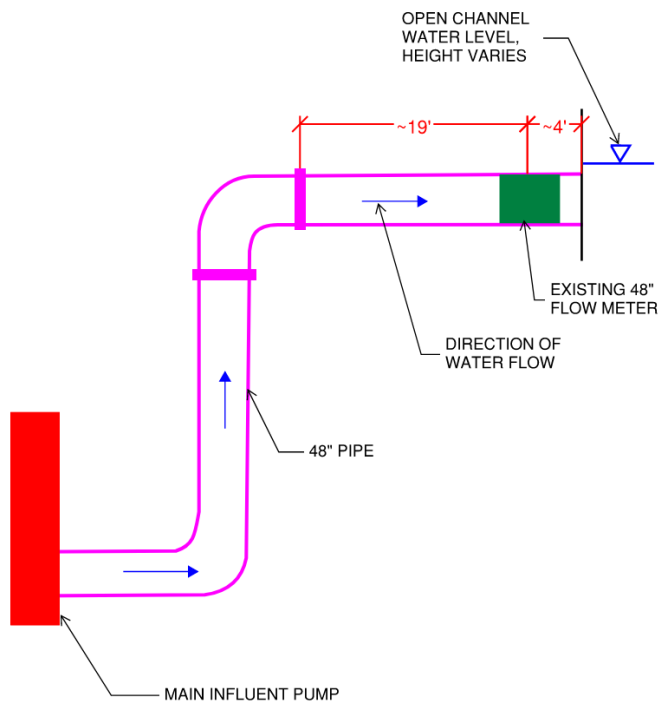
Figure 4-3. New Fluid Power Hydraulic System and Lube Oil Pumps Locations



For the discharge sluice gates, except for minor equipment upkeep needs, no major issues were found. It is recommended that efforts be directed to perform basic maintenance tasks, such as replacing unresponsive operating buttons and repainting the actuator housing.

The current flow meters are nearing the end of their useful operating lives and are recommended for a full replacement. In particular, a magmeter that requires 0 to 4 feet of straight downstream pipe run is preferred over traditional magmeters due to the limited length of existing straight pipe. Figure 4-4 represents the current location of the existing flowmeter with the length of downstream and upstream straight pipe run. The proposed new flow meter could be either the SITRANS FM MAG 5100W Magmeters or Proline Promag W 400 Magmeters because upstream and downstream straight run pipe lengths are not required to record accurate flow measurements.

Figure 4-4. Approximate Channel Pipe Run Lengths (Profile View)



To prevent the lube oil pumps from being submerged by future flood events, it is recommended that the entire pump system be replaced and relocated. Removable grating would be added to the basement floor for the relocation of the lube oil pump system to a higher elevation, away from the flood zone. Preliminary findings indicate that the lube oil pumps would need to be upgraded in response to the increased pressure required due to the elevation difference from the main influent pumps. Figure 4-4 shows the location for the new lube oil pumps.

4.7 Task 8.2 – Staging and Implementation Plan

This section summarizes the Staging and Implementation Plan.

4.7.1 Implementation Plan Objectives

Two alternatives were developed to address the following concerns for implementing the IPS resiliency improvements:

- Sequence of construction
- Impacts to operations and maintenance
- Shutdowns
- Construction staging areas
- Cost estimates
- Construction schedules

A complete description of the staging and implementation plans is presented in *Task 8.2 Staging and Implementation Plan* TM (Jacobs 2024f).

The following two staging and implementation plans were developed to implement the same improvements:

- **Alternative 1:** Complete construction in 5-years: project starts with electrical and mechanical procurement; during that time, the structural retrofits are completed. After the electrical and mechanical systems are procured and the structural retrofit is completed, construction begins for all electrical and mechanical equipment.
- **Alternative 2:** Complete construction in 3-years: project starts with electrical and mechanical procurement; during that time, the structural retrofits are completed. After the electrical and mechanical systems are procured, the work for each pumping train is completed. During the dry weather shutdowns, all work for a pump train is completed concurrently, including:
 - Installing VFDs
 - Realigning the power
 - Replacing the main pump motors
 - Replacing the flow meters
 - Installing the new lubricant oil pump
 - Retrofitting the channel

Alternative 1 is intended to reduce the impacts to operations by reducing the number of concurrent construction activities. This also reduces work area conflict risks and risks of not completing the planned work given any partial shutdown that could delay restoring full pumping capacity before wet weather.

However, the Alternative 1 schedule is longer, and EBMUD may want to reduce the schedule and accommodate more concurrent construction activities in the IPS, which would speed up construction. Therefore, Alternative 2 was developed, which decreases the schedule by completing multiple tasks for each train concurrently as opposed to sequentially. Alternative 2 allows for fewer partial shutdowns of the IPS by allowing more concurrent construction activities. Concurrent work is phased with the electrical realignment and drives and motor replacement (Tasks 5 and 6), so all partial shutdowns related to each pumping channel train are phased together.

These two alternatives provide a framework for finalizing how the resiliency improvements will be implemented. This framework helps balance risks, impacts to operations, and schedule as the project is taken to final design during the next phase.

The information in this plan should also be used to develop a risk register and required preconstruction activities, and should remain a living plan as the design is taken to the final phases. (This section to be updated with final review of the implementation plan from EBMUD.)

4.8 Other Considerations

Throughout the IPS Resiliency Project, there was significant coordination with MWWTP Operators and Maintenance personnel. During site visits and workshops, MWWTP personnel noted different items that were not necessarily under the scope of the project, but they indicated implementation of these items could improve the IPS.

Additionally, there are items that emerged during the planning and preliminary design phase that either were not originally in scope or were not appropriate to be developed at this phase. The following items should be further investigated during the detailed design phase:

- **Discharge piping modifications at the IPS building seismic joint:** If, during a seismic event, the buildings move independently at construction joints, any stiff elements across joints will be sheared and have a high likelihood of failure. Failure at joints will inevitably flood the drywell of the pump room, with no guarantee that flooding will stop before the high-water level of the discharge channel. This would result in the IPS being out of service potentially for an extended period of time.

Therefore, providing piping flexibility at this location is critical for seismic resiliency. This will require removal and insertion of piping elements and components in the main discharge pipe at the shear location where the two structures meet. The replacement of the flowmeters in Task 7 impacts this same section of pipe, and could be coordinated with this scope of work for the discharge piping modification at the IPS building seismic joint. Refer to location A on Figure 4-5 for more information.

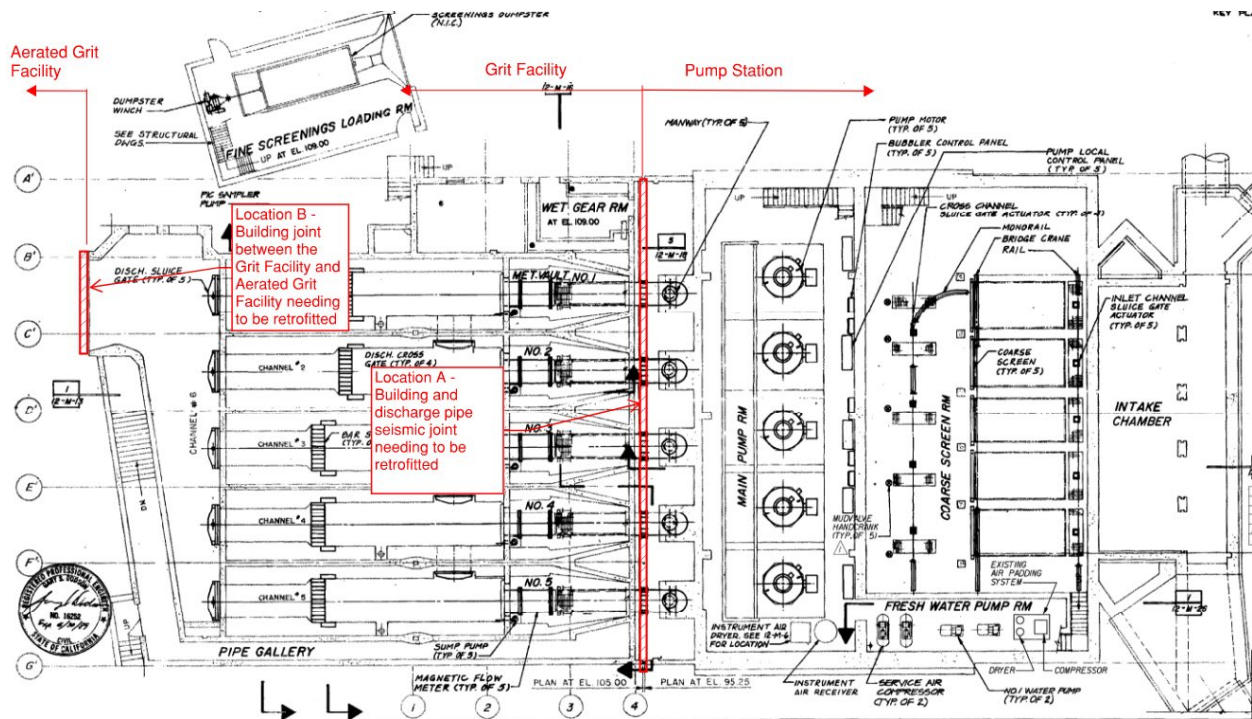
- **Further coordination with the distributed control system (DCS) and other control systems in the IPS:** The installation of new equipment and their corresponding controls will need to be coordinated with implementation of the MWWTP DCS. Additionally, MWWTP Operator personnel noted that they would like more flexibility in the system; for example, more flexibility in what can be bypassed. Currently, this is being reviewed, and an additional TM is being developed and will be included as an attachment.
- **The sump pump in the IPS pump room can flood and become inoperable if the pump room is flooded:** Operators requested that these sump pumps be submersible, so if the pump room floods, these pumps can continue to remove water.
- **Coordination with this project and the master electrical resiliency project before finalizing the IPS design modifications:** The master electrical resiliency project reviews the EBMUD MWWTP as a whole. One of the electrical resiliency recommendations under the IPS Resiliency Project impacts the S-1 switchgear, which falls under the master electrical resiliency project scope. Further coordination is needed so that the switchgear recommendation is included in the master electrical resiliency project.
- **Bridge crane has been noted to be unreliable, but the bridge crane will be needed to make post-seismic repairs and improvements to the main IPS pumps:** If the main IPS pumps receive significant damage from a seismic event, the bridge crane will be needed to remove the pumps for repairs. If the bridge crane is not operational, pump repair will be delayed and the type of repairs that can be accomplished will be limited. Currently, repairs and maintenance of this bridge crane are completed by a third party. For the seismic event outage, the bridge crane is noted as "Not Critical" because its general function is not required for the operation of the MWWTP. However, the importance of needing the bridge crane for pump repairs and modifications as a result of a seismic event or other emergency makes this piece of equipment important.
- **Exterior Architectural Improvements:** The exterior of the building is covered in EIFS which is aging and will be impacted by the seismic retrofit. EBMUD should consider what improvements are needed to the exterior of the building. Exterior improvements could consist of patching and repainting the exterior EIFS, replaced the EIFS with an alternate coating, or refurbishing the original clay masonry under the EIFS. Note the current cost estimate and schedule assumes that the EIFS will be patched around the seismic retrofitted areas.
- **Seismic joint to the adjacent aerated grit channels:** The aerated grit channels are beyond the scope of this project but the IPS ties directly into this facility and discharges influent into these channels. The joint between these structures is not adequate for seismic separation and damage to this joint is likely

Task 8.4 IPS Resiliency Project Report

given an earthquake. The final design of the IPS resiliency improvements should include retrofitting this joint to allow for seismic movement and reduce damage at this location. Refer to location B on Figure 4-5 for more information.

- **Improved handling and disposal of solids from the coarse screens:** Currently, this process is manual and requires the use of a crane located in the lower basement to remove materials from the coarse screens. Handling solids in this manner can be time consuming and difficult for operators.

Figure 4-5. Influent Pump Station Seismic Joint Locations



5. Next Steps

This planning and preliminary design phase of the project identified the major resiliency improvements, estimated construction cost, construction sequencing and schedule, and impacts to operations and required partial shutdowns to complete the work. The following next steps should be considered to implement the resiliency improvements:

1. The additional considerations outlined in section 4.8 of this report should be evaluated for inclusion into the project.
2. Select a design consultant to progress this preliminary phase document to final design.
3. Finalize selection of early procurement packages.
4. Finalize construction milestones so that the contractor can successfully complete the work. Construction milestones should include:
 - a. Draft and Final approved submittal dates, especially for work that is required to be complete during a partial shutdown of the IPS.
 - b. Mobilization
 - c. Any preparation tasks needed to be completed before a shutdown.
 - i. Partial Shutdown Work including delivery of equipment and materials needed during the shutdown period including any contingency provisions that will ensure the contractor completes all shutdown work within the shutdown period.
 - d. Startup and testing for each component and pump train.
 - e. Substantial completion.
 - f. Final completion.
5. Facilitate a FEMA review and obtain approval of the resiliency improvement design documents.
6. Progress the design to construction ready documents and advertise the project to bid for construction.
7. Select a contractor for construction of the IPS resiliency improvements and issue NTP.
8. Prepare for construction staffing needs, both internal EBMUD staff and consultant support.
9. Prepare for partial shutdowns during the construction phase.

6. Conclusions

The IPS is currently seismically deficient which could result in complete loss of service and potential loss of life if it is not retrofitted. The IPS has adequate pumping capacity to handle wet weather flows when all five pumps and associated ancillary equipment are operating. The IPS has experienced shutdowns due to power feed outages and problems with ancillary equipment that can be the single point of failure for the IPS.

This project identifies improvements and strategies to address these deficiencies to improve the resiliency and safety of the IPS. The mitigation improvements that EBMUD intends to implement include:

- Seismically retrofitting the structure
- Repairing the concrete liner in the intake channels
- Anchoring and bracing pipes and equipment
- Retrofitting the anchors for the pumps and fine screens to meet seismic requirements
- Realigning the power distribution system so that the IPS will remain operational if one of the two power feeds is offline, which could also include installation of a new ATS
- Replacing the LCIs with VFDs
- Replacing the main pump motors
- Relocating and replacing the FPHS, which includes two new HPUs installed on each power utility line
- Installing new lube oil pumps that are relocated above the lower basement where the pumps could be damaged due to flooding
- Replacing the flow meters
- Replacing critical electrical and mechanical equipment with seismically braced and certified equipment
- Retrofitting the seismic joints between the building structures, including where critical piping crosses these joints
- Making improvements to the control system to allow for manual operation of the IPS so EBMUD can restore emergency pumping capacity within 72 hours after an earthquake

Two alternatives have been developed for how these improvements can be implemented. Alternative 1 is intended to reduce risk and impacts to operations by completing most tasks sequentially and reducing the amount of consecutive work occurring at the same time. Alternative 1 requires a longer construction schedule and will result in a higher construction cost.

Alternative 2 is intended to reduce the construction schedule by completing more tasks concurrently. Because of the shorter schedule, Alternative 2 also costs less due to:

- Reduced general conditions
- Bonding
- Insurance
- Associated profit

Table 6-1 summarizes the construction duration and estimated AACE International (AACEI) Class 5 costs (AACEI 2020) for each alternative.

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Table 6-1. Cost and Duration Summary Table

Implementation Alternative	Construction Duration (years)	Estimated ACEI Class 5 Cost (\$)
1	5	42,190,000
2	3	35,940,000

Source: (ACEI 2020)

A Class 5 estimate is a planning-level estimate with a potential range of -50% to +100%.

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Task 4.3 IPS Seismic Retrofit Preliminary Design Report

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East Bay Municipal Utility District

Influent Pump Station Resiliency Project
November 14, 2024

Prepared by

Jacobs

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- 1 Structural Retrofit Drawings
- 2 Cost Estimate
- 3 Construction Schedule

Executive Summary

East Bay Municipal Utility District (EBMUD) is improving the resiliency of the Influent Pump Station (IPS) for the Main Wastewater Treatment Plant (MWWTP), located in Oakland, California. Jacobs was contracted to serve as the Design Engineer for the project. The IPS is a 425-million gallon per day pump station that is critical to maintaining flow into the MWWTP. The resiliency project includes seismic, electrical, and ancillary equipment upgrades and potential improvements to pumping.

A preliminary design for seismic retrofitting the IPS has been completed and is detailed in the following report and drawings. The IPS was evaluated for ASCE41 Basic and Enhanced seismic performance objectives. The Basic seismic performance objectives are the minimum required by code, while the Enhanced seismic performance objectives are consistent with those for essential facilities such as hospitals. The seismic hazard levels considered in this retrofit include the Basic Safety Earthquake-1 (BSE-1E), which has a 20% probability of exceedance in 50 years, and the Basic Safety Earthquake-2 (BSE-2E), which has 5% probability of exceedance in 50 years. The IPS was analyzed for these earthquakes using a SAP2000 model for each of the following main IPS components:

- Pumping Station
- Grit Facility
- Fine Screening Handling Building
- Sky Bridge

Material evaluation was also completed to determine the existing concrete compressive strength. This evaluation consisted of reviewing the original construction concrete cylinder test results and taking concrete cores of the IPS walls and slabs. The concrete compressive strength used in the analysis was based on the new concrete core test results, which results in a small increase in strength compared to that specified in the original design.

The IPS does require seismic retrofit to achieve both sets of seismic performance objectives. The retrofits include the following:

- Strengthening the roof diaphragms around the existing roof openings, including added concrete and steel beams and additional welding of metal roof deck
- Applying concrete overlay on select shear walls
- Applying fiber-reinforced polymer strengthening systems on select shear walls
- Applying fiber-reinforced polymer confinement of main Pump Station columns
- Strengthening the braced frame connections, columns, and collector beams in the fine screening room
- Adding anchors to secure the brick veneer to the supporting concrete wall in the fine screening room
- Adding anchors and strengthening the connections between precast concrete wall panels and braced frames in the fine screening room
- Strengthening the pumping channel walls at the cross gate openings with fabric reinforced cementitious matrix
- Placing piles and pile caps around three sides of the Grit Facility
- Increasing capacity for movement at expansion joints, including in the five pipes exiting the pumps into the Grit Facility
- Modifying equipment anchorages and adding bracing

Task 4.3 IPS Seismic Retrofit Preliminary Design Report

The preliminary design drawings show the above retrofits planned for the Enhanced level criteria as recommended. At the Basic level, almost all of the above retrofits are required. While the IPS could be retrofitted to the lower-level Basic seismic performance objective, only modest increases are required to achieve the Enhanced performance objective. The following minor retrofits could be eliminated under the Basic performance objective:

- Strengthening ground floor beams at the Pump Station with fiber-reinforced polymer
- Adding roof beams at the upper roof of the Pump Station
- FRP retrofit of the pier at Grid Line C3 at the Pump Station

While the added piles at the Grit Facility could be slightly reduced in number for the Basic seismic performance objective, those piles add to the control of displacements at the expansion joints between structures thus eliminating some is not recommended. Overall, the cost reductions related to achieving only the Basic seismic performance objective would be expected to be less than \$70,000.

Construction considerations include maintaining operation of the IPS during the seismic retrofit and avoiding shutdowns or reduced pumping capacity during the wet season. The retrofit of the channel walls around the cross gates will need to occur over two dry seasons because only two channels can be shutdown at a time during the dry season, and no channel shutdowns are allowed during the wet weather season. Temporary routing of power and controls will need to be in place before retrofitting the braced frames, as this work will require access to the frame braces, columns, beams, and connections. Concrete will need to be pumped into areas inside of the IPS for the concrete wall overlays. The piles and pile caps will require relocating buried conduit on the southern side of the IPS.

In conclusion, the proposed seismic retrofit will help EBMUD achieve the resiliency goals for the IPS. The retrofit can be implemented while maintaining operation of the IPS but does require relocating existing power and control conduits and conductors. The work will also require two dry seasons to complete because work is required in the pumping channels.

1. Introduction

East Bay Municipal Utility District (EBMUD) is improving the resiliency of the Influent Pump Station (IPS) for the Main Wastewater Treatment Plant (MWWTP), located in Oakland California. Jacobs was contracted to serve as the Design Engineer for the project. The IPS is a 425 million gallon per day pump station that is critical to maintaining flow into the MWWTP. The resiliency project includes seismic, electrical, and ancillary equipment upgrades and potential improvements to pumping.

This technical memorandum (TM) describes the preliminary design for seismic retrofits for the IPS building as conducted as part of Task 4. This TM will be combined with other TMs into a final report that will describe the full scope of the project. The final report will also include construction scheduling, costs, and staging which will carry forward to final design.

1.1 Summary of the IPS Structure

The IPS facility consists of four separate structures separated by expansion joints. Figure 1-1 shows the relation of those structures with respect to each other.

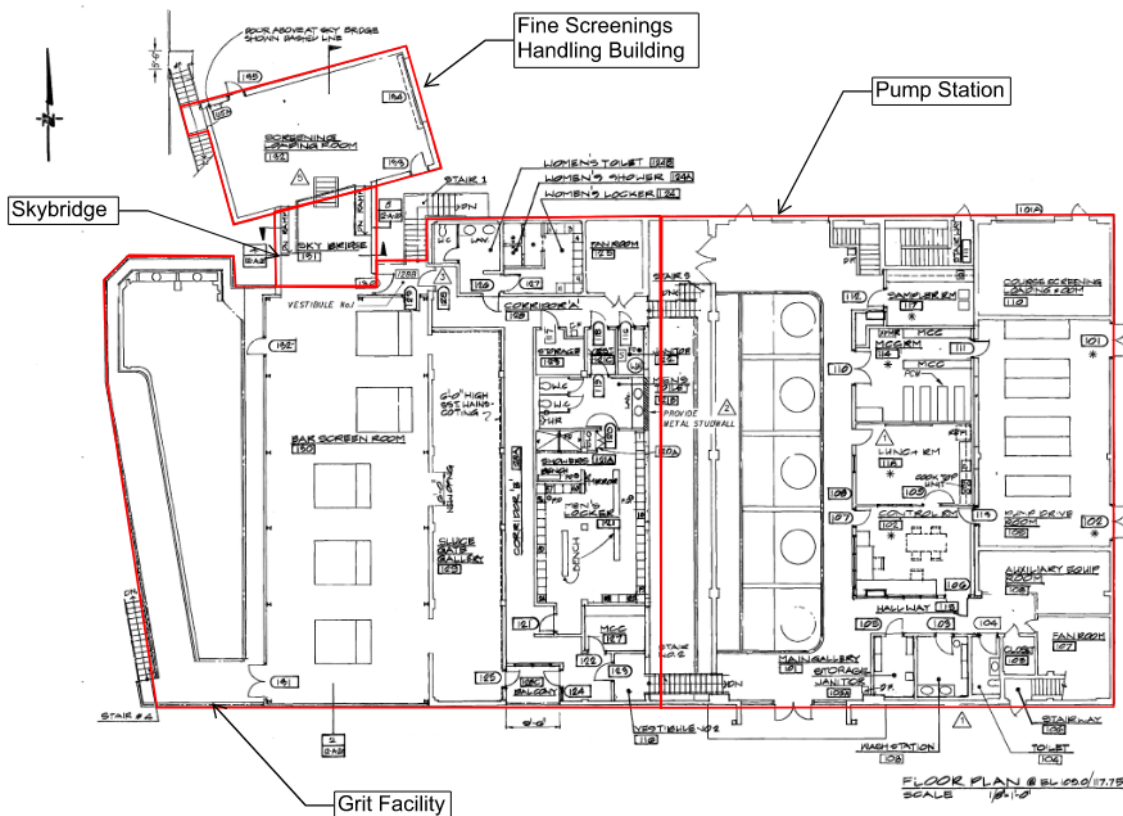


Figure 1-1. IPS Facility Elements Shown at Ground Floor Level and Above

The original construction of the four structures comprising the IPS occurred under the following construction projects:

- SD18 Project from 1949, which consisted of the Pump Station and Grit Facility. It should be noted that while the SD18 drawings call the structure the Grit Facility, the present day grit handling facilities were moved to an area adjacent to the IPS in the 1970s. For the purpose of this report, any reference to the Grit Facility will refer to the original structure constructed as part of SD18.
- SD170 Project from 1989, which consisted of the Fine Screenings Handling Building and Skybridge.

The SD170 Project work also modified portions of both the Pump Station and Grit Facility. The SD43 Project from 1950 introduced a 10-foot extension off the northwestern corner of the Grit Facility to connect to the Sedimentation Basins Influent Channel. Small changes to equipment and openings occurred in later work at the facility.

The Pump Station contains the Intake Chamber, Pump Drive Room, Lunchroom, Control Room, IPS pumps and motors, Locker Rooms, Sample Room, and pumping channels. The Intake Chamber was expanded as part of the SD170 Project work. The structure consists of reinforced concrete roof and floor slabs supported by reinforced concrete walls. This portion of the facility has a deeper basement that is approximately 35.5 feet below grade at the deepest location. The foundation is a reinforced concrete mat slab that is not pile supported.

The Grit Facility contains the fine screens and conveyors crossing the Skybridge from the screens to the Fine Screenings Handling Building. This portion of the facility is a combination of braced steel frames and concrete walls and is supported by a pile foundation. The Grit Facility is structurally isolated from the Pump Station, but the joint between the two facilities is smaller than what is needed for a seismic joint as indicated in Section 7.

1.2 Operational Requirements

The IPS must remain operable during construction of the seismic retrofit. It is assumed that the IPS can operate with a reduced pumping capacity during the dry season between May 1 and September 30. During this dry season, two pump trains, including the associated channels, can be shutdown, but three pumping trains need to remain operable at all times. During the wet season (October 1 to April 30), no shutdowns are permitted.

1.3 Permitting Requirements

The retrofit of the IPS is a voluntary improvement and is not being mandated by the building official. It is assumed that EBMUD will self-permit this work, as well as conduct an engineering peer review of the seismic retrofit. The retrofit will be funded with a FEMA Hazard Mitigation Grant and thus will require the design documents to incorporate the funding requirements and be reviewed by FEMA prior to going to bid.

2. Seismic Loads and Performance Objectives

Section 2 describes seismic loads and performance objectives related to project design.

2.1 Summary

The performance objectives for the IPS structural evaluation were selected in accordance with Table 2-1 of *ASCE 41-17, Seismic Evaluation and Retrofit of Existing Buildings* (ASCE 2017) for existing buildings, and in accordance with the EBMUD Wastewater Seismic Projects Seismic Evaluation and Retrofit Design Criteria Guidelines. The *International Building Code* assigns Risk Category III to wastewater treatment facilities and other public utility facilities, so Risk Category III will be used for this assessment for Basic Performance Objectives. Risk Category IV will be used as an Enhanced objective. This category is typical for essential facilities such as hospitals. Table 2-1 summarizes the performance objectives for the project.

Table 2-1. Performance Objectives for Existing Buildings

Risk Category	BSE-1E	BSE-2E	IPS Objective
I and II	Life Safety Structural Performance	Collapse Prevention Structural Performance	Not applicable
	Life Safety Nonstructural Performance (3-C)	Hazards Reduced Nonstructural Performance ^a (5-D)	
III	Damage Control Structural Performance	Limited Safety Structural Performance	Basic
	Position Retention Nonstructural Performance (2-B)	Hazards Reduced Nonstructural Performance ^a (4-D)	
IV	Immediate Occupancy Structural Performance	Life Safety Structural Performance	Enhanced
	Position Retention Nonstructural Performance (1-B)	Hazards Reduced Nonstructural Performance ^a (3-D)	

Source: ASCE 41-17, Table 2-1. Basic Performance Objective for Existing Buildings (ASCE 2017).

^a Compliance with ASCE 7-16 provisions for new construction is deemed to comply.

The seismic hazard levels considered in this retrofit include the Basic Safety Earthquake-1 (BSE-1E), which has a 20% probability of exceedance in 50 years, and the Basic Safety Earthquake-2 (BSE-2E), which has a 5% probability of exceedance in 50 years.

2.2 Basic Objectives

The Basic structural performance levels selected were Damage Control Performance under the BSE-1E seismic hazard and Limited Safety Performance under the higher demands of the BSE-2E seismic hazard. Damage Control Performance is midway between Life Safety Performance—the damage level expected of a typical new Risk Category I or II building design under the Maximum Considered Earthquake in the building code—and Immediate Occupancy. Limited Safety Performance is midway between Life Safety Performance and Collapse Prevention Performance. Collapse Prevention Performance is the point at which no margin against collapse is retained for seismic loads, but the structure still supports gravity loads.

2.3 Enhanced Objectives

The Enhanced structural performance levels selected were Immediate Occupancy under the BSE-1E seismic hazard and Life Safety Performance under the higher demands of the BSE-2E seismic hazard. Life Safety Performance allows for damaged components but retains a higher margin of safety against the onset of partial or total collapse than allowed for Limited Safety.

2.4 Nonstructural Objectives

Nonstructural component screening in accordance with the Federal Emergency Management Agency's (FEMA's) standard *FEMA E-74, Reducing the Risks of Nonstructural Earthquake Damage (2021)* will be performed during this phase of the project. The FEMA E-74 evaluation will be used to identify deficiencies in nonstructural component anchorage and bracing. These deficiencies will be addressed in future phases of the project using the performance objectives shown in Table 2-1.

Position Retention is required for the lower demands of the BSE-1E seismic hazard, and Hazards Reduced Nonstructural Performance is required under the BSE-2E demands. Position Retention considers that the nonstructural components may be damaged to the point where they cannot immediately function, but they are anchored sufficiently to avoid falling over or breaking utility connections.

Hazards Reduced Nonstructural Performance allows for damage levels that can create falling hazards, but the nonstructural components are required to be anchored where that poses a risk to life safety. That anchorage will be considered in future phases of the project. Egress preservation is not required to meet the Hazards Reduced criteria; but stairways, openable doors, emergency lighting, and fire alarms should remain available under the Position Retention criteria for the more frequent earthquakes at the lower BSE-1E hazard level ground accelerations.

3. Seismic Hazards

The BSE-1E and BSE-2E seismic hazards (where “E” designates existing structures) used for this project were defined as part of the Geotechnical Study Report for the MWWTP and Dechlor/Outfall Area Site (AGS-19-030) (AGS 2020b). Figure 3-1 shows the response spectra for those two hazards, in addition to the BSE-1N and BSE-2N hazards (“N” designating new) used for evaluating new building performance for comparison. The response spectra for new structures typically produce higher demands than retrofit design for existing structures under ASCE 41-17 requirements. For the site-specific spectra shown in Figure 3-1, the demands are the same for periods of less than 0.5 seconds where the IPS structures fall.

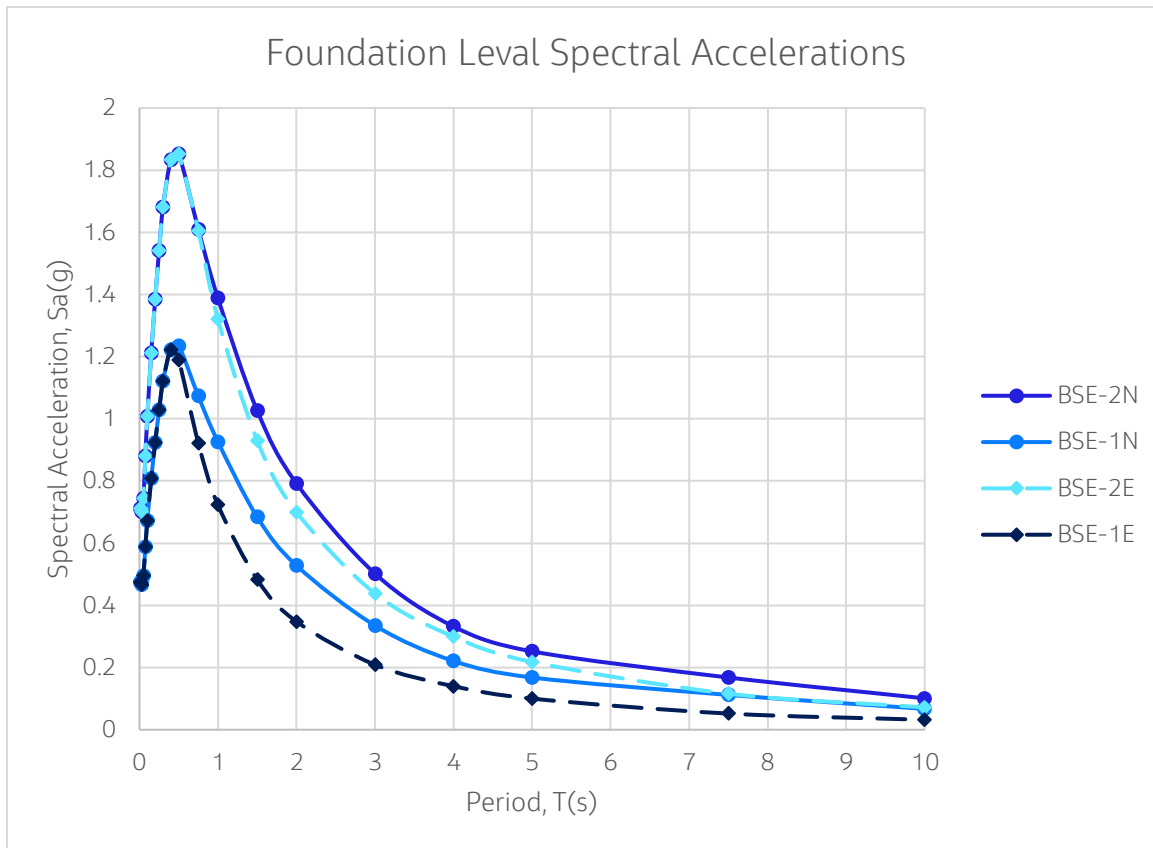


Figure 3-1. Response Spectra

For reference, return periods associated with these hazard levels are provided in Table 3-1, as well as the probability of exceeding that level of ground motion in a 50-year design life. Return periods are considered to be the average number of years that pass before an exceedance of that level of seismic hazard.

Table 3-1. Recurrence of ASCE 41 Hazard Level Seismic Events

ASCE 41 Hazard Level	Return Period (years)	Exceedance Probability In 50 Years (%)
BSE-2N	2,475	2
BSE-2E	975	5
BSE-1N	475	10
BSE-1E	225	20

Source: ASCE 2017.

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As the structure periods lengthen with damage, the response spectra input to the analysis program were modified to hold the peak acceleration constant rather than having an ascending branch of the curve from period of 0 seconds (peak ground acceleration). Figure 3-2 shows the modified response spectra used in the SAP2000 structural model.

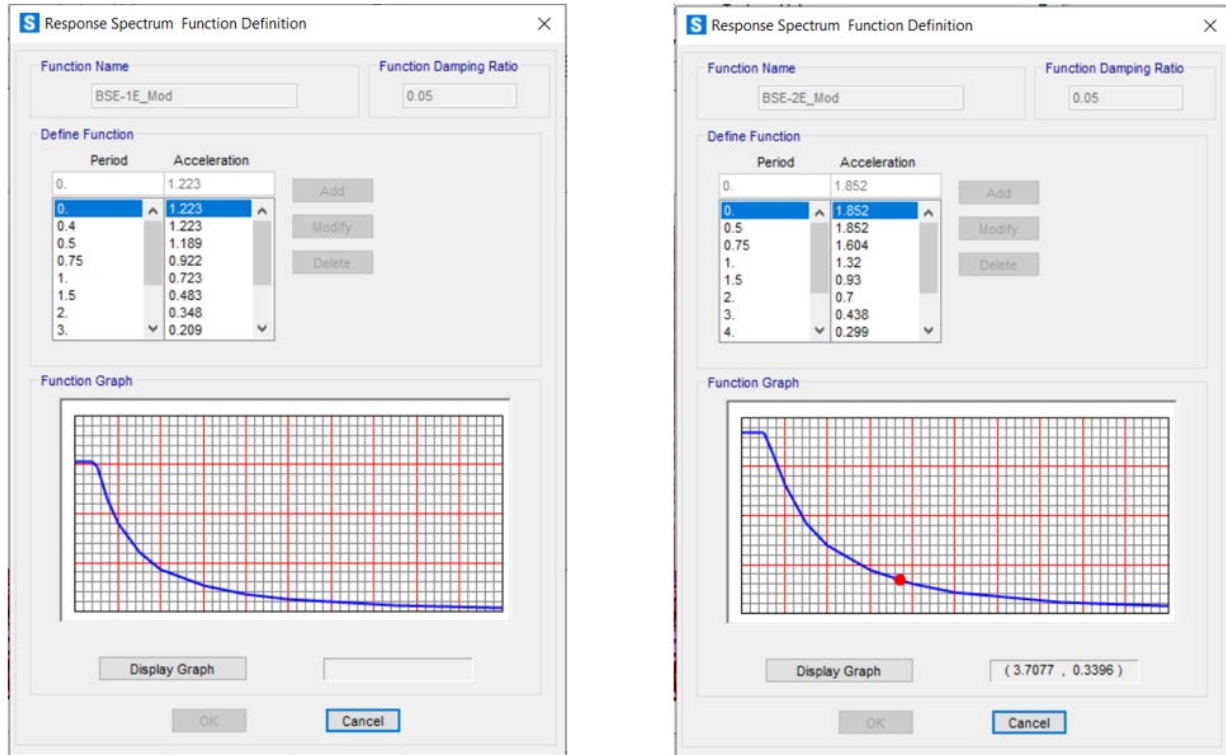


Figure 3-2. Response Spectra Used in the SAP2000 Model

7. Retrofit Requirements

The retrofit measures need to take into account the operational requirements noted in Section 1.2 above. The installation needs to minimize the invasiveness in the facility. The minimization of invasiveness involves consideration of retrofit or strengthening instead of replacement, minimization of the weight of members, and locating the retrofits in accessible areas.

7.1 Grit Facility Braced Frames

Braced frame retrofits will need to be carefully designed to minimize the impact on facility operations. This includes minimizing individual member weights and minimizing the amount of field welding.

7.1.1 Braced Frame Deficiencies

The braced frame columns on the north and south sides of the room are overstressed for both the Basic and Enhanced performance objectives. The braced frame beams on the north and south sides of the room are also overstressed for both the Basic and Enhanced performance objectives. See Section 6.3.1 of this report for which specific members are overstressed.

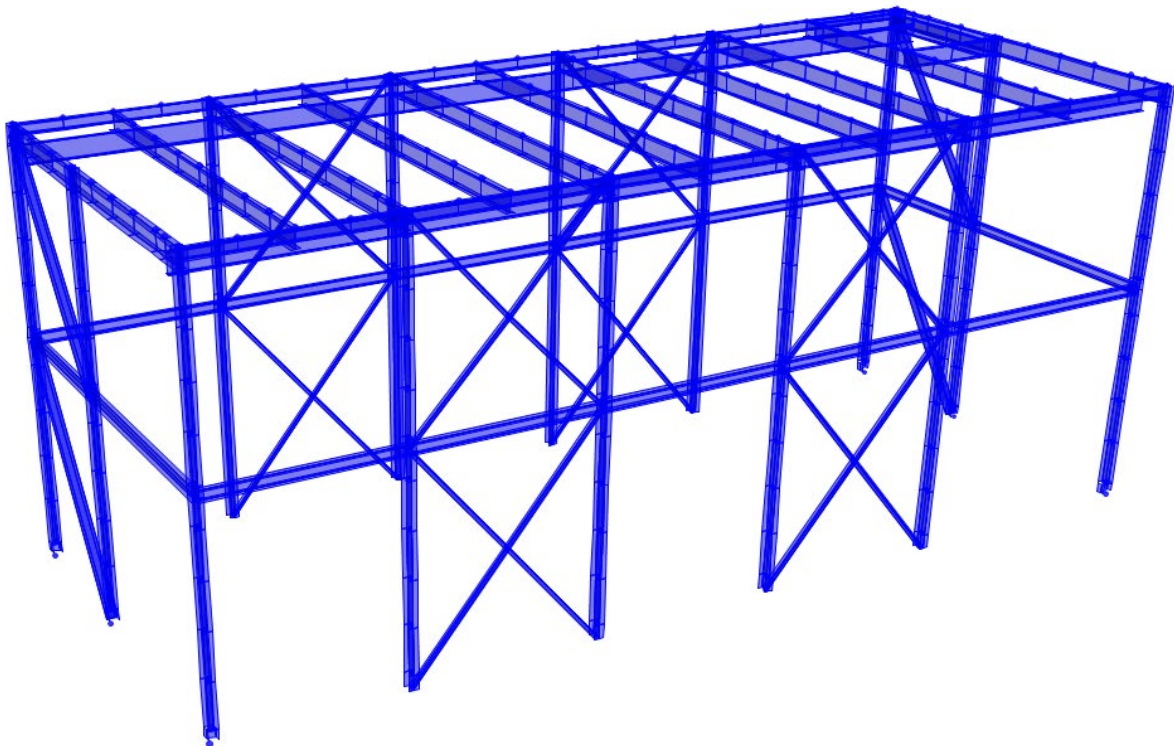


Figure 7-1. Braced Frame Configuration

The braced frame gusset plates and base plates for all of the bracing connections below EL 132.75 are overstressed for both the Basic and Enhanced performance objectives. The X-brace connections above EL 132.75 are not overstressed. The single diagonal, hollow structural section brace connections above EL 132.75 are overstressed for both Basic and Enhanced performance objectives. The overstressed connections have multiple failure modes with DCR > 1.0.

7.1.2 Braced Frame Retrofits

The overstressed braced frame members can either be reinforced or replaced.

7.1.2.1 Braced Frame Reinforcing

Reinforcing the braced frame columns and beams consists of adding angle sections to the flanges of the existing members to both increase the overall area of the member and increase the section modulus. The below figure shows the general reinforcement scheme.

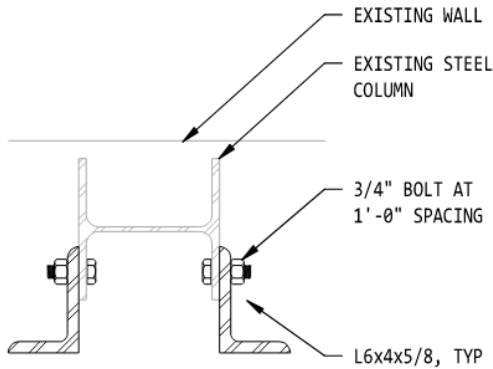


Figure 7-2. Braced Frame Column Reinforcement

7.1.3 Connection Retrofits

The braced frame connections, including gusset plates and base plates are overstressed. The connection retrofit requirements will be different between the bracing reinforcement and bracing replacement options.

For failure modes controlled by bolts, the connection will be welded to take the full load (no load sharing between bolts and welds).

See Attachment 1 for preliminary retrofit details.

7.2 Grit Facility Roof Diaphragm

There is a large opening in the roof diaphragm that will require reinforcement to provide continuity for diaphragm forces to flow around it. The reinforcement will be angle drag struts with diaphragm connections that are sized to resist the loads that the opening interrupts, see the below figure.

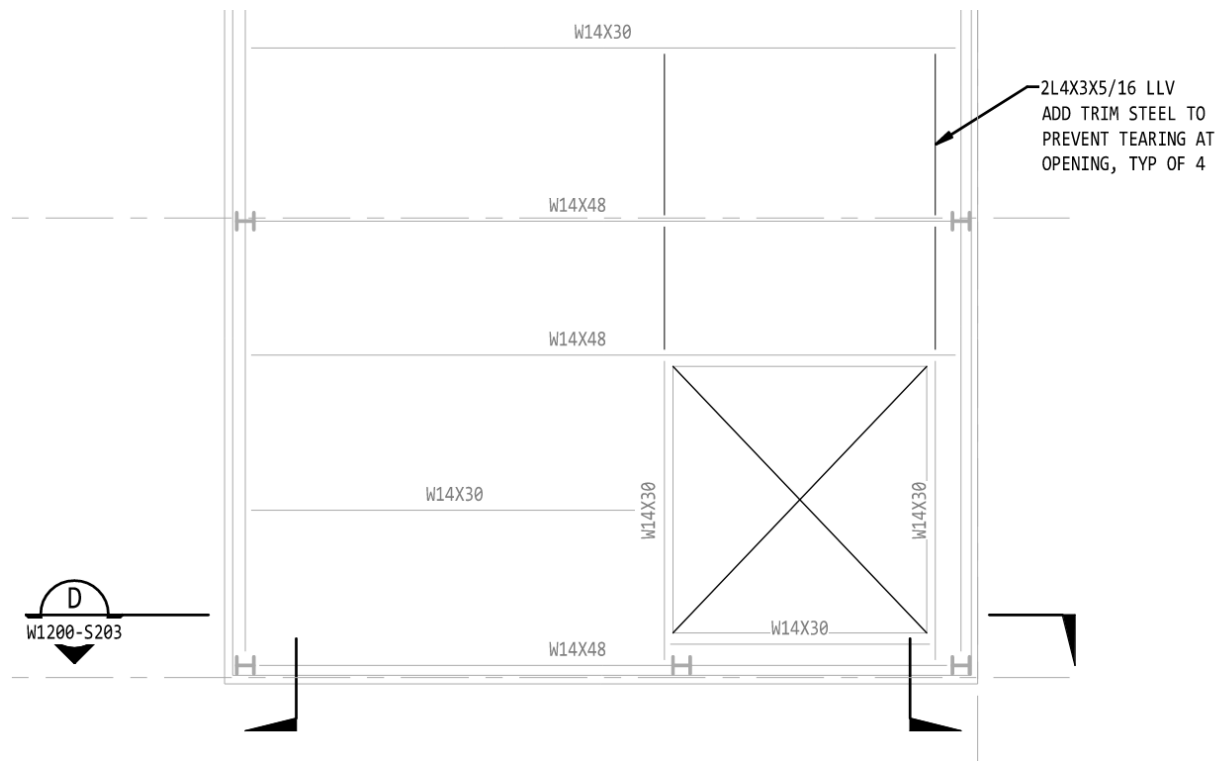


Figure 7-3. Roof Diaphragm Reinforcing

The roof decking is also overstressed. Reducing the sidelap connection spacing to 6" provides sufficient capacity for both the Basic and Enhanced performance criteria. Additional top seam welds at 12" spacing for a 6" net spacing will be provided.

7.3 Concrete Wall Retrofits

The concrete wall retrofits fall into two primary areas: overlay walls and FRP reinforcing.

7.3.1 Basic Versus Enhanced Performance Objectives for the Concrete Walls

The concrete wall sections with a DCR greater than one are typically force controlled due to the minimal existing amount of reinforcing. Adding reinforcing changes those walls from being force controlled to deformation controlled. There is, therefore, negligible difference in the amount of required reinforcing between the Basic and Enhanced performance objectives because adding sufficient reinforcing to change to a deformation controlled action allows the walls to meet either performance objective.

7.3.2 Concrete Overlay Walls

Concrete overlay walls strengthen the existing concrete sections for compression, shear, and tension by providing both additional concrete area and additional steel reinforcement. The overlay wall is connected to the existing wall with adhesive dowels to transfer loads from the existing structure into the new structure and to allow the new and existing walls to act compositely. The adhesive dowels will need to be sized and spaced to transfer the loads and the reinforcing in the overlay wall will need to be sized to allow the composite section to resist the applied forces. See the below figure for an example of a typical overlay wall.

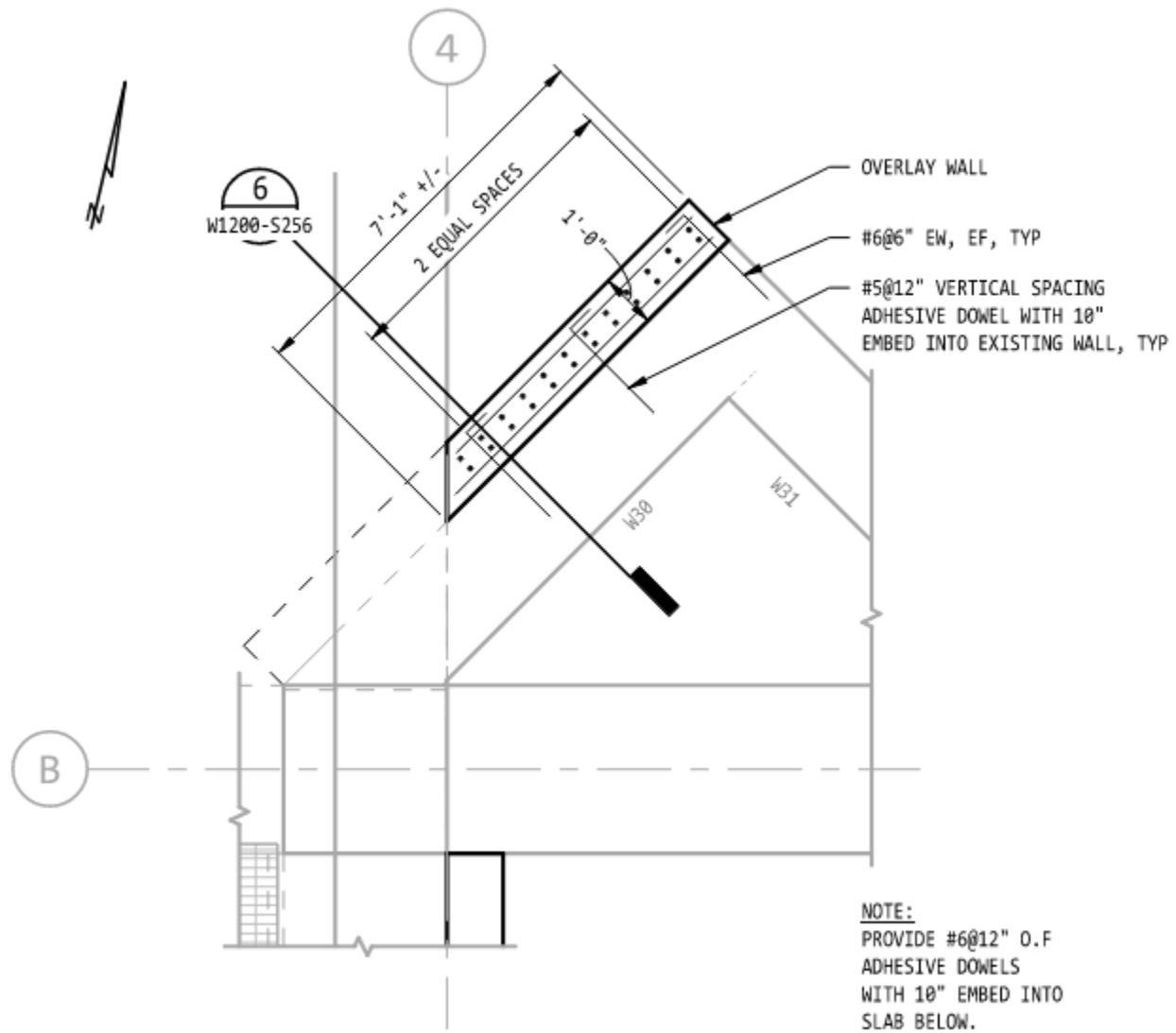


Figure 7-4. Example Concrete Overlay Wall

7.3.3 FRP Reinforcing

FRP reinforcing strengthens the existing wall for shear and tension. The reinforcing consists of FRP fabric adhered to the existing concrete wall with epoxy. The fabric can provide either unidirectional or bi-directional reinforcement. Bi-directional reinforcement is typically used where there is a deficiency in shear capacity, while unidirectional reinforcement can be used where bending capacity in one direction needs to be supplemented. Figure 7-5 shows a case where unidirectional reinforcement is used to add bending capacity in both directions using discrete strips oriented with the existing reinforcing to be supplemented.

Multiple sections of wall are overstressed because there is insufficient reinforcement in the section to preclude a brittle failure, which results in the section being considered force controlled. The addition of FRP reinforcing can help recategorize the section as deformation controlled by adding post-cracking capacity to the point where that capacity exceeds the force that caused the cracking to occur. In addition to the added capacity of the FRP, categorization as a deformation-controlled element also results in

additional increased capacity from the use of the expected material strengths of the existing concrete and reinforcing bars.



Figure 7-5. Example FRP Reinforcing; seblog.strongtie.com

Typically, either concrete overlays or FRP reinforcing can be utilized to retrofit the existing concrete walls and piers. Concrete overlays have been shown as the preference where space is available and significant relocation of existing wall-mounted conduits or equipment is not required. FRP reinforcing has greater flexibility for installation around existing attachments. For either system, adhesive anchorage in drilled holes is provided where continuity through slabs and beams is required.

7.3.4 Fabric Reinforced Cementitious Matrix

The inlet channels have divider walls that were added as part of the SD170 project. The walls are thick and attract significant load, but have minimal reinforcing to resist that load resulting in a need to retrofit the walls. Retrofits in the inlet channels are subjected to a harsh environment that would greatly reduce the life of conventional FRP retrofits. Adding significant concrete thickness to the inlet channels would also restrict the flow and affect the hydraulics. Fabric reinforced cementitious matrix (FRCM) is a retrofit that overcomes the limitations of more conventional retrofit methods. FRCM uses a fiber reinforcing grid that is bonded to the existing concrete with a repair mortar instead of epoxy. The reinforcing grid is then covered with repair mortar that protects the fiber reinforcing from harsh environments and erosion. FRCM is a system that can strengthen the influent channel walls while taking up minimal space to avoid restricting flows. Refer to Figure 7-6 for an example of an FRCM retrofit.



Figure 7-6. Example FRCM Reinforcing: sika.com

7.4 Brick Veneer and Precast Wall Retrofits

The existing connection between the concrete walls and the brick veneer in the Grit Facility is unknown. The concrete and veneer need a positive connection to prevent the veneer from falling off during an earthquake. Retrofit helical ties will be provided to positively attach the brick veneer to the underlying concrete. Helical ties are intended for this sort of retrofit. Their installation is minimally invasive and they do not affect the finished appearance of the wall.

The existing precast concrete walls in the Grit Facility have multiple locations where the connection from original construction is missing the bolt. A new clip will be provided to connect the precast panels to the columns; refer to Figure 7-7.

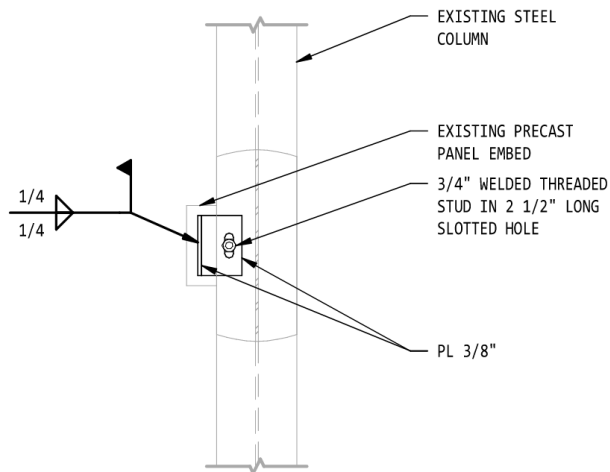


Figure 7-7. Retrofit Clip at Precast Panel

The precast panels are also missing a connection to the floor adjacent to the door openings. A post with connections to the panel and the floor will be added to provide out of plane capacity at the wall where it connects to the slab as shown in Figure 7-8.

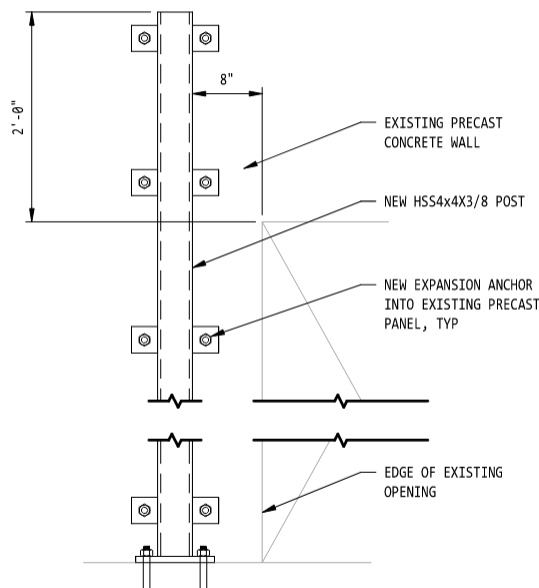


Figure 7-8. Retrofit Connection at Precast Panel

7.5 Concrete Slab Retrofits

The Pump Station lower roof slab is overstressed for both the Basic and Enhanced performance objectives. New concrete beams will be provided on top of the existing roof to add additional vertical slab capacity as well as distribute diaphragm loads around the HVAC openings that were placed in the original roof slab.

The concrete beams are shown in the Figure 7-9. Similar beams are added to the upper roof slab to address deficiencies around openings added after the original construction.

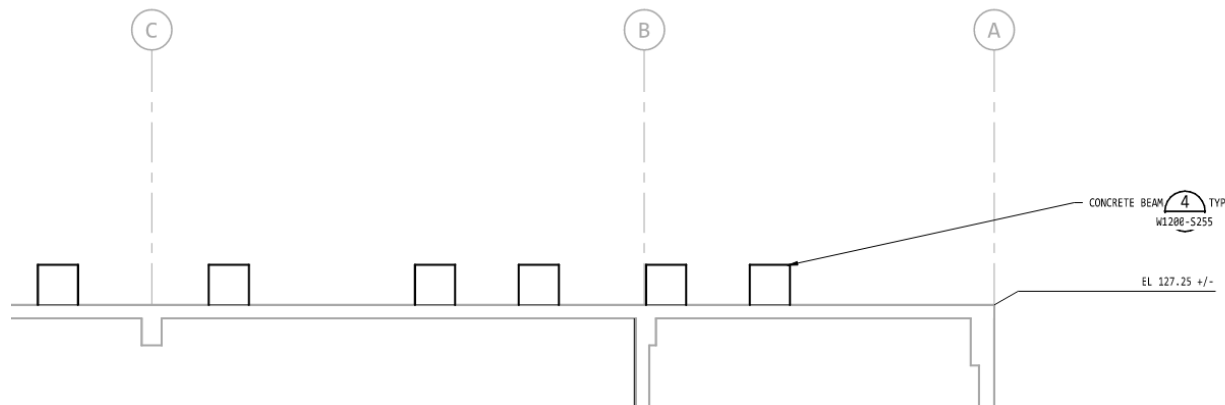


Figure 7-9. Pump Station Roof Retrofit Beams

7.6 Pile Retrofits

To minimize impacts to operations, pile retrofits at the Grit Facility are best constructed outside the footprint of the existing building.

7.6.1 Pile Deficiencies

As indicated in Section 6.2.9 above, Grit Facility piles are typically overstressed when considering lateral shear resistance given group effects on the lateral capacity. Some piles around the perimeter, particularly at the north side, are also overstressed under vertical seismic loads due to overturning of the structure. The piles at the Skybridge and the Fine Screenings Handling Building are generally acceptable, with slight overstress under the Enhanced Performance Objectives criteria from overturning forces. No retrofits are recommended at those two facilities as the use of calculated rather than tabulated C_1 and C_2 factors per Section 7.4.1.2.1 of ASCE 41 (ASCE 2017) would be expected to reduce demands to acceptable levels.

7.6.2 Pile Retrofits

Addressing the deficiencies in the existing piles can be performed by either improving the strength of the soil surrounding the piles or by addition of new piles. Soil improvements such as deep soil-mixing and jet grouting may be considered in future phases of design, but the current retrofit scheme based on available geotechnical recommendations is focused on the addition of new piles around the perimeter of the Grit Facility where space is available.

Base shears reported from the Grit Facility SAP2000 model are 16,067 kips for the BSE-2E seismic hazard and 10,796 kips for the BSE-1E seismic hazard. Average lateral demands for the 177 existing piles as reduced by the m-Factors of ASCE 41 (ASCE 2017) on soil resistance are shown in Table 7-1.

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Table 7-1. Average Grit Facility Pile Shear Demands

Performance Level	Demand Capacity Ratios			
	BSE-1E Seismic Hazard		BSE-2E Seismic Hazard	
	m-Factor	Average Pile Shear Force	m-Factor	BSE-2E Life Safety
Basic Performance Objectives	2.5	24.4 kips	3.5	25.9 kips
Enhanced Performance Objectives	2	30.5 kips	3	30.2 kips

The available lateral resistance for the existing piles is shown in Figure 7-10, while Figures 7-11 and 7-12 show the resistance to vertical loads. To preclude group effects reducing the lateral pile capacity, piles are required to be spaced a minimum of 6 diameters apart on center (AASHTO LRFD Bridge Design Specifications as referenced in AGS 2020a). The existing piles within a pile cap do not meet that requirement, but piles in separate pile caps do. Therefore, the average of Rows 1 and 2 is used for the average capacity of piles in pile caps typically having four piles in two rows of two. To achieve that average capacity, the lead Row 1 piles are required to have the structural capacity to develop the 45 kip force. For the vertical loads, the same assumption of a 28-foot pile length is used as was reported by AGS based on available evidence from the original construction.

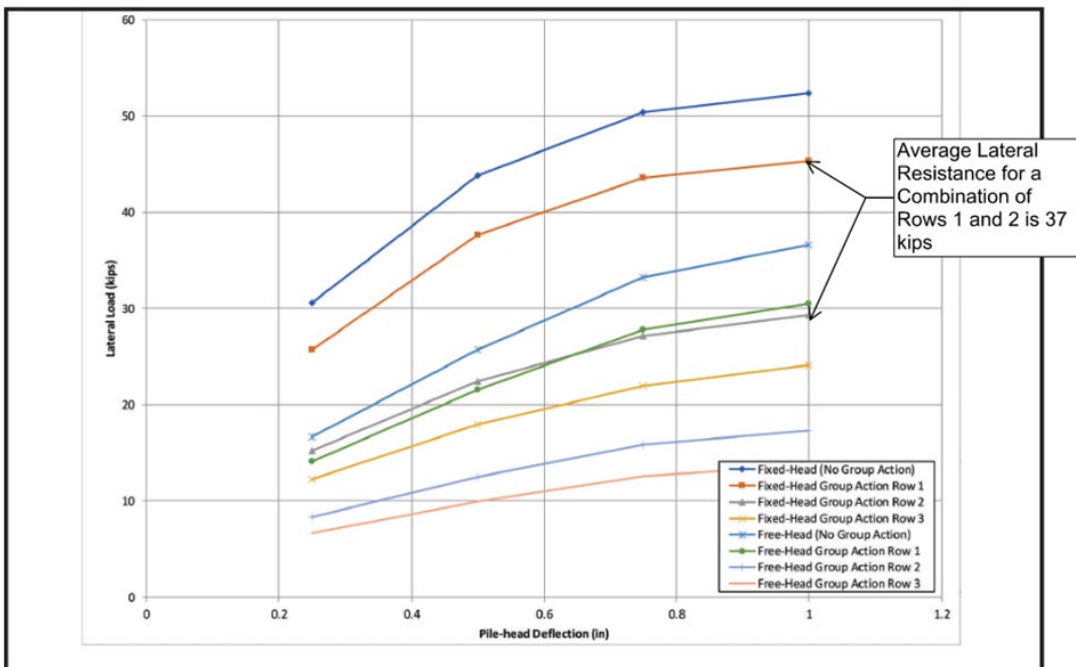


Figure 7-10. Existing Pile Lateral Capacity (AGS 2020a)

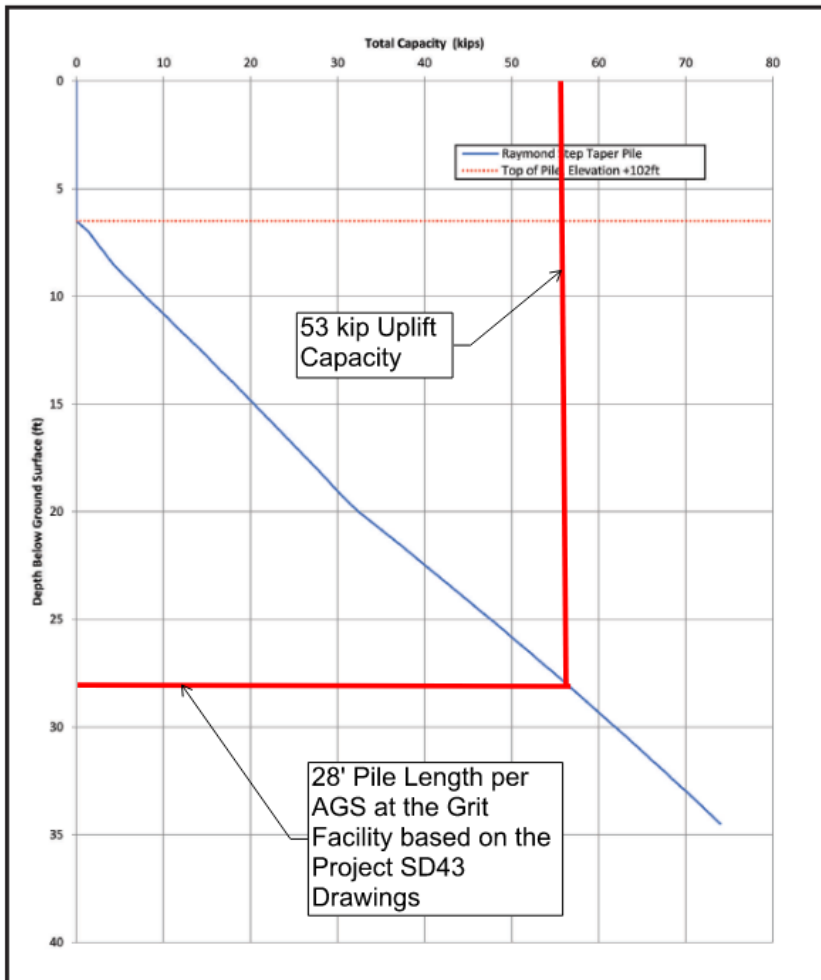


Figure 7-11. Existing Pile Uplift Capacity (AGS 2020a)

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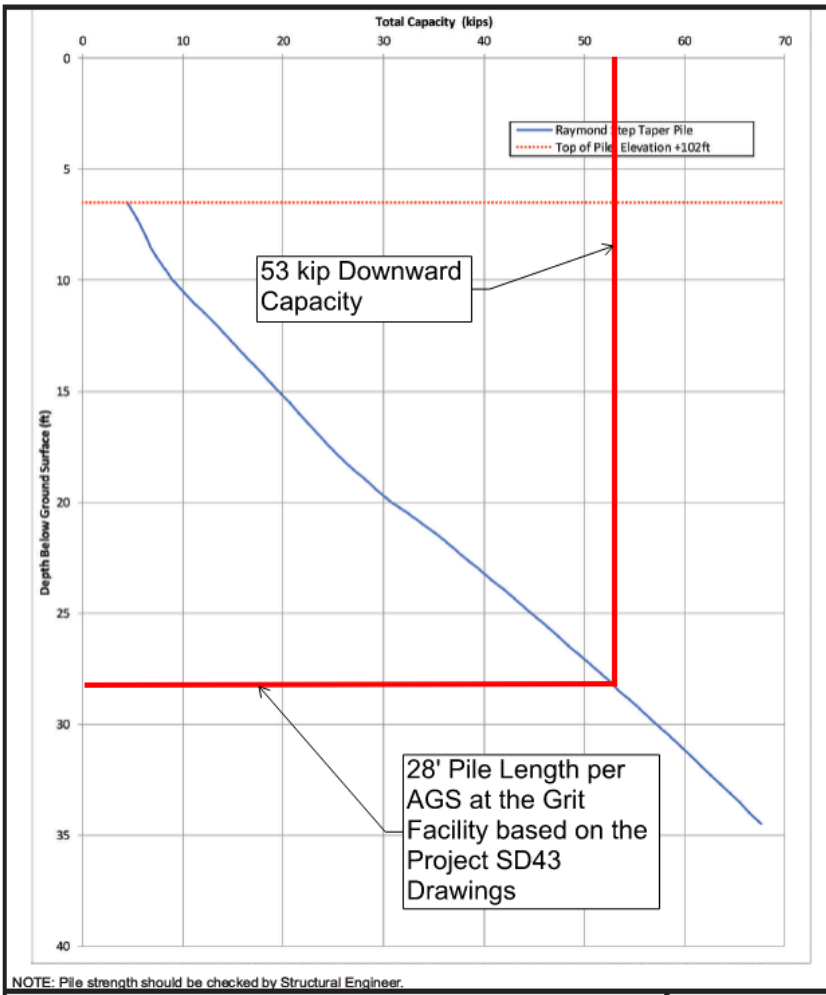


Figure 7-12. Existing Pile Downward Capacity (AGS 2020a)

Since the existing piles have sufficient lateral capacity at 37 kips to resist the base shear adjusted by the allowed m-Factors, the retrofit is designed to help resist the overall structure rotation and concentrated forces at existing shear walls. Figure 7-13 shows the locations for new pile caps selected to avoid existing structural elements other than the stair landing at the north.

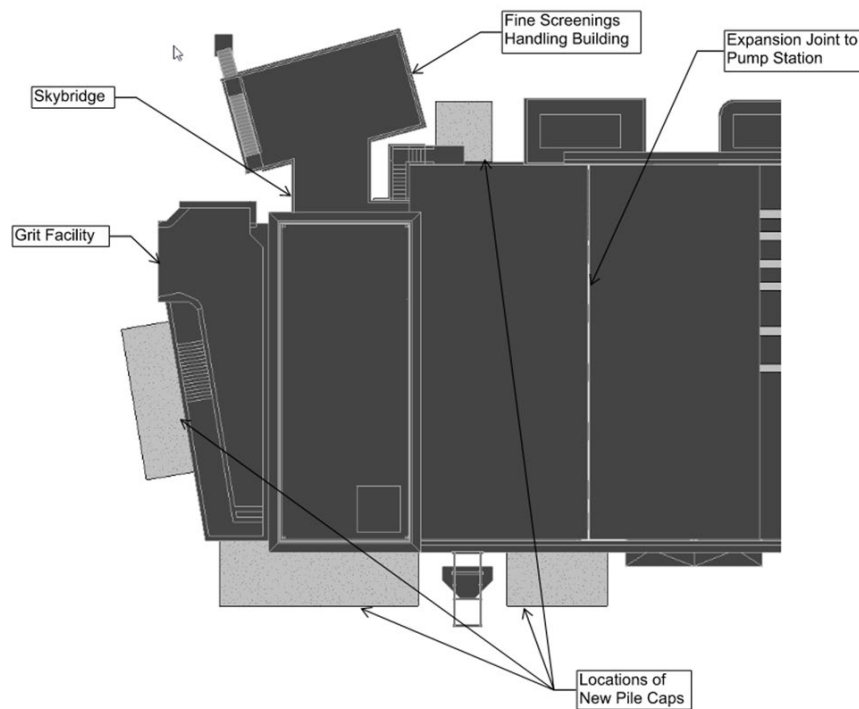


Figure 7-13. Added Pile Cap Locations

To best utilize the available space for the pile caps, larger diameter 24" cast-in-drilled-hole (CIDH) piles are selected similar to those supporting the duct bank to the main substation. Figure 7-14 shows the lateral capacity of the duct bank piles.

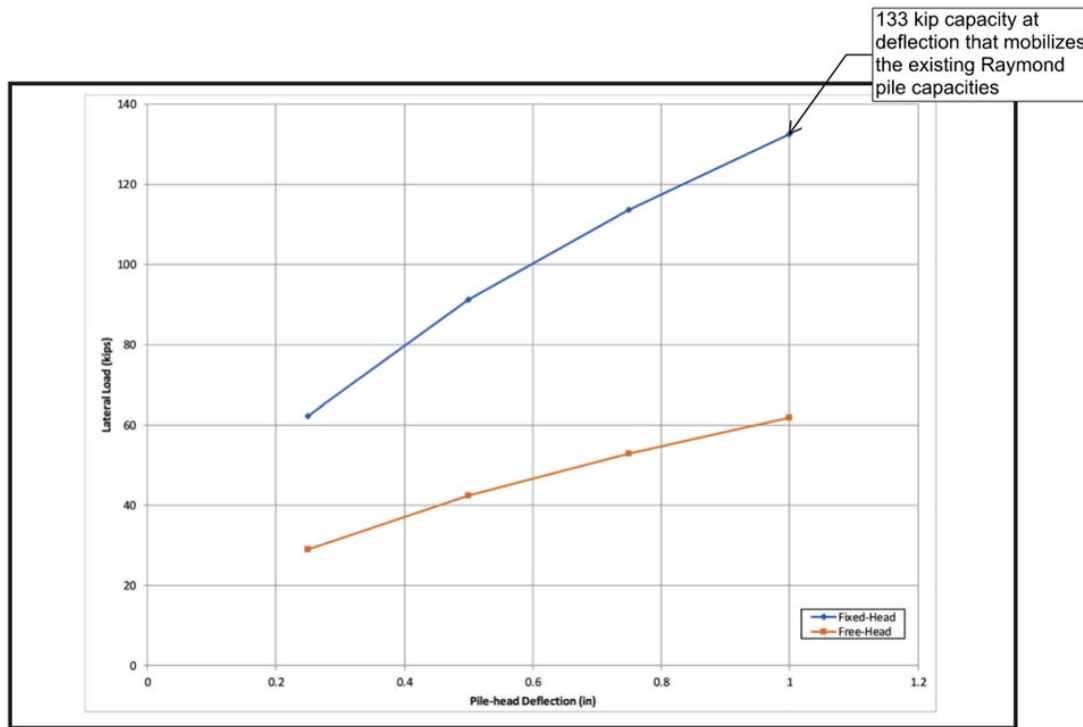


Figure 7-14. Lateral Capacity of 24" CIDH Piles (AGS 2020a)

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According to the AASHTO LRFD Bridge Design Specifications (AASHTO 2020), the capacity of the first row of piles is unreduced at a spacing of 5 diameters on center. The second row is reduced to 85 percent capacity, while the remaining rows are reduced to 70 percent capacity. That is substantially improved over 80, 40, and 30 percent, respectively, for a 3-diameter pile spacing. Therefore, the layout for the new piles maintains 10-foot spacings in the direction parallel to wall and resisting structure rotation where added capacity is needed. Sixteen piles contributing 1,729 kips at 10-foot spacing each direction fit within the available pile caps on the south side of the Grit Facility, while 8 piles at 10-foot spacing parallel to the wall and 6-foot spacing perpendicular to the wall can be located on the west. Due to the presence of odor control equipment on the north side of the facility in addition to the Fine Screenings Handling Building, only 4 piles at 10-foot spacing in each direction are added.

To evaluate the effectiveness of adding piles at the locations shown in Figure 7-13, nonlinear static pushover analyses were defined in SAP2000 as indicated in Figure 7-15.

Load Case Data - Nonlinear Static

Load Case Name: PilePushX [Set Def Name] Notes: [Modify/Show...]

Load Case Type: Static [Design...]

Initial Conditions:
 Zero Initial Conditions - Start from Unstressed State
 Continue from State at End of Nonlinear Case [ST_CASE]

Important Note: Loads from this previous case are included in the current case

Modal Load Case: All Modal Loads Applied Use Modes from Case [MODAL]

Loads Applied

Load Type	Load Name	Scale Factor
Load Pattern	1E_X	0.3333
Load Pattern	1E_X	0.3333

[Add] [Modify] [Delete]

Other Parameters:
Load Application: Full Load [Modify/Show...]
Results Saved: Multiple States [Modify/Show...]
Nonlinear Parameters: Default [Modify/Show...]

[OK] [Cancel]

Figure 7-15. East-West Static Pushover Case Definition

The applied load patterns ("1E_X" and "1E_Y") were scaled to orient the combined maximum base shear in each orthogonal reaction as indicated in Figure 7-16 conservatively assuming the north-south and east-west base shears indicated above occur at the same time and represent the peak base shear in any direction from the seismic hazard considered. The scale factor in Figure 7-15 reflects the m-Factor of 3 for Life Safety performance under the Enhanced performance criteria per Section 8.4.5.1.1 of ASCE 41.

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	OutputCase	CaseType Text	StepType Text	GlobalFX Kip	GlobalFY Kip	GlobalFZ Kip	GlobalMX Kip-in	GlobalMY Kip-in	GlobalMZ Kip-in	GlobalX in	GlobalY in	GlobalZ in
▶	PilePushX	NonStatic	Min	-19576.863	6.569E-08	-8.102E-09	6222.217	-26982302.1	-8846622.1	0	0	0
	PilePushY	NonStatic	Min	-5.774E-09	-19576.863	2.445E-07	26993843.25	-9409.715	-685703.703	0	0	0

Figure 7-16. Nonlinear Static Pushover Case Base Shears as Reported by SAP2000

Only the piles were considered to be nonlinear in these analyses, with Figure 7-17 showing the lateral pile spring definition for the existing piles and Figure 7-18 showing the definition for the added piles. A force level of 52.5 kips is included in the spring definition to provide for better convergence for plastic demands. Nonlinear springs were also incorporated for the piles in the vertical direction, so that the piles could not supply resistance above their uplift and downward capacities.

Link/Support Directional Properties

Edit

Identification

Property Name: PileSpring

Direction: U3

Type: MultiLinear Plastic

NonLinear: Yes

Hysteresis Type And Parameters

Hysteresis Type: Kinematic

No Parameters Are Required For This Hysteresis Type

Properties Used For Linear Analysis Cases

Effective Stiffness: 122

Effective Damping: 0

Shear Deformation Location

Distance from End-J: 0

Multi-Linear Force-Deformation Definition

	Displ	Force
1	-24.	-53.
2	-1.	-52.5
3	-0.5	-47.5
4	-0.25	-30.5

Hysteresis Definition Sketch

Kinematic Hysteresis Model

Action

Deformation

OK Cancel

Figure 7-17. Nonlinear Lateral Force-Displacement Definition for Existing Pile Spring

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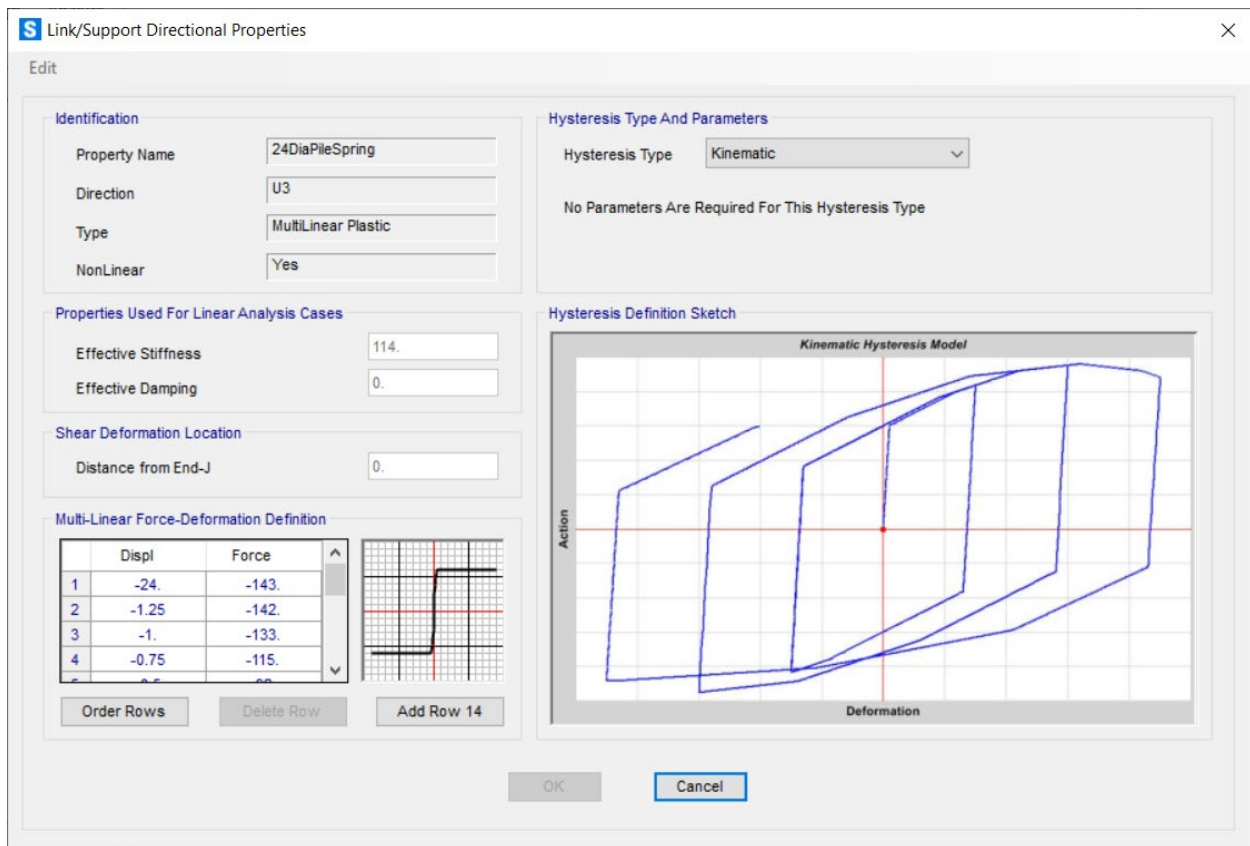


Figure 7-18. Nonlinear Lateral Force-Displacement Definition for Added Pile Spring

Figures 7-19 and 7-20 show the resulting pile forces pushing to the required base shear in the east-west and north-south directions, respectively, for the controlling BSE-2E demands. As seen, the lateral loads on the existing Raymond piles are reduced below 37 kips as required when reduced by an m-Factor of 3 for the Enhanced Performance Objectives. The added 24" CIDH piles are highlighted in red in these figures.

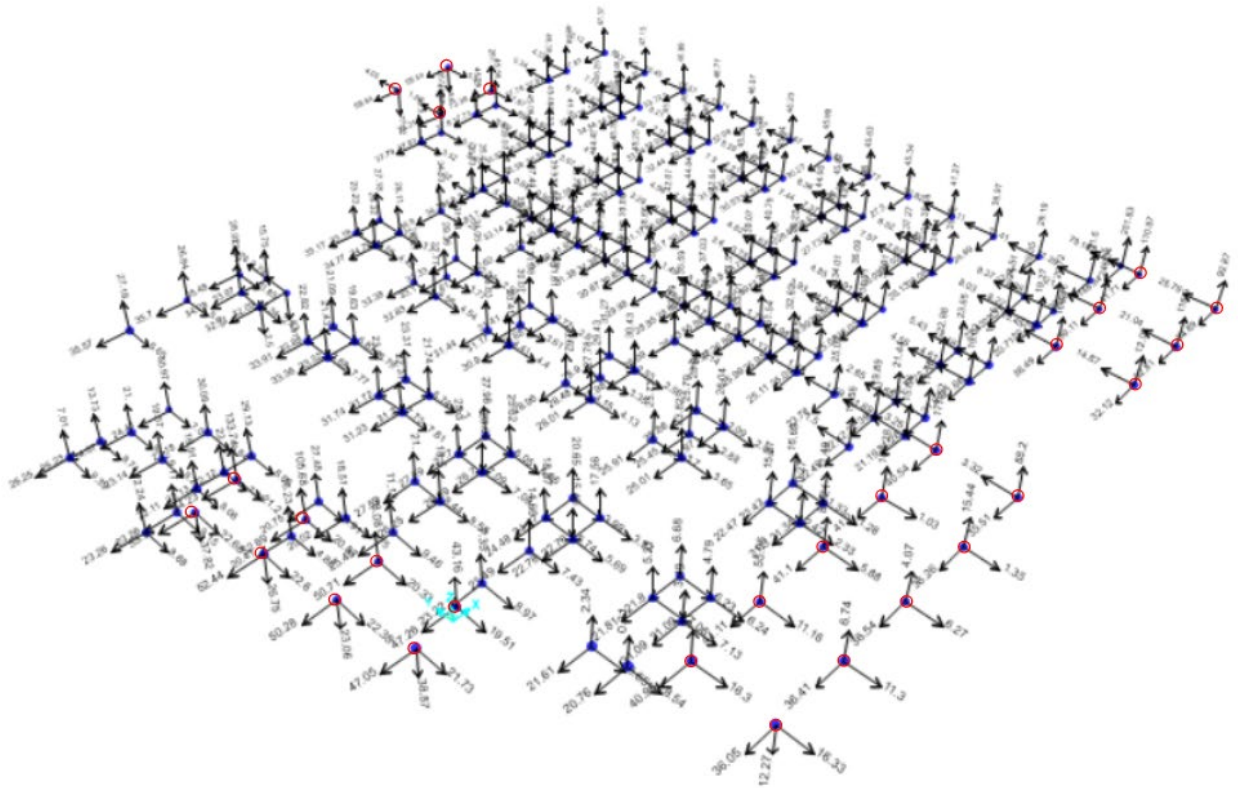


Figure 7-19. Pile Reaction Forces for East-West Base Shear Case

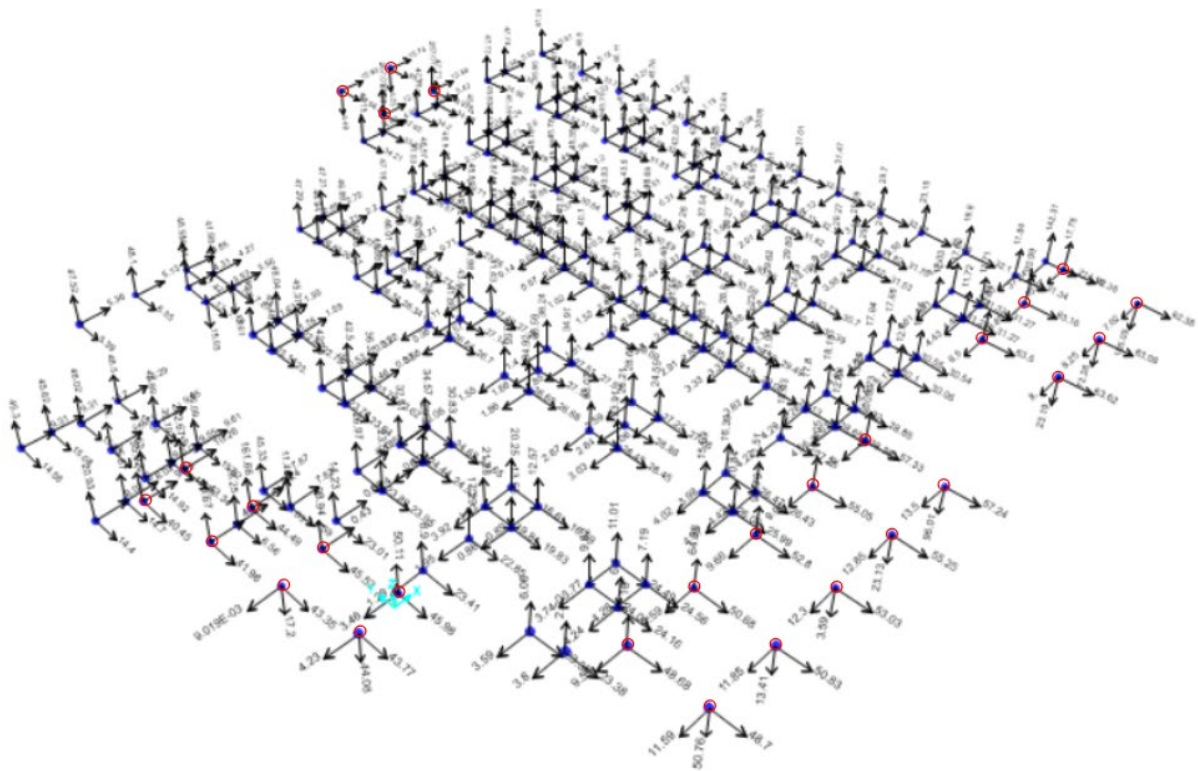


Figure 7-20. Pile Reaction Forces for North-South Base Shear Case

7.7 Seismic Joints

Displacements across the existing expansion joints were evaluated based upon the SAP2000 analysis results. Table 7-2 summarizes the movements anticipated at the BSE-2E seismic hazard level after pile retrofits to the Grit Facility. The large movement at the Grit Facility to Skybridge connection is the unreinforced precast panel deflection over the large opening. Joint movements at the connecting channels are estimated based upon the IPS results with similar displacements expected at the piles and fairly rigid response from the structure. No analyses were performed for those adjoining facilities in this phase of the design.

Table 7-2. Joint Movements at Existing Expansion Joints

Location	Joint Movement			
	Grit Facility End		Opposite End of Joint	
	Perpendicular to Joint	Parallel to Joint	Perpendicular to Joint	Parallel to Joint
Grit Facility to SD43 Sedimentation Basins Influent Channel Top Slab	0.88 inch	0.53 inch	1.00 inch	1.00 inch
Grit Facility to SD43 Sedimentation Basins Influent Channel Bottom Slab	0.50 inch	0.32 inch	0.75 inch	0.75 inch
Grit Facility to SD118 Grit Tanks Influent Channel Top Slab	0.75 inch	0.88 inch	1.00 inch	1.00 inch
Grit Facility to SD118 Grit Tanks Influent Channel Bottom Slab	0.53 inch	0.79 inch	0.75 inch	0.75 inch
Grit Facility to SD170 Skybridge Top Slab	5.78 inch	1.81 inch	1.70 inch	1.34 inch
Grit Facility to SD170 Skybridge Bottom Slab	0.81 inch	0.86 inch	0.40 inch	0.30 inch

Required movement capacities at the expansion joints are conservatively considered as additive of the two ends, as each separate structure may be moving in a different direction at a given time. This exceeds the requirements of ASCE 41 Section 7.2.13.1 as structures on the opposite sides of the joints have not been scoped for analysis. These required movements exceed the 5/8-inch joint width to the Sedimentation Basins Influent Channel, the 1-inch joint width to the Grit Tanks Influent Channel, and the 3/4-inch joint width to the Skybridge.

7.7.1 Joint Retrofits

Seismic joint systems with sufficient capacity to handle the relative movements indicated are available, such as the Sika EMSEAL SJS-Seismic Joint System shown in Figure 7-21. Standard joint widths of 3.5, 8, and 16 inches are available, with allowable relative movement equal to half of the joint width. For the joint at the Skybridge connection to the Grit Facility, installation of a seismic joint requires saw cutting and removal of the end of the concrete bridge structure sufficient for the joint width. Modifications to the conveyor supports straddling the joint are also required to allow for the joint movement.

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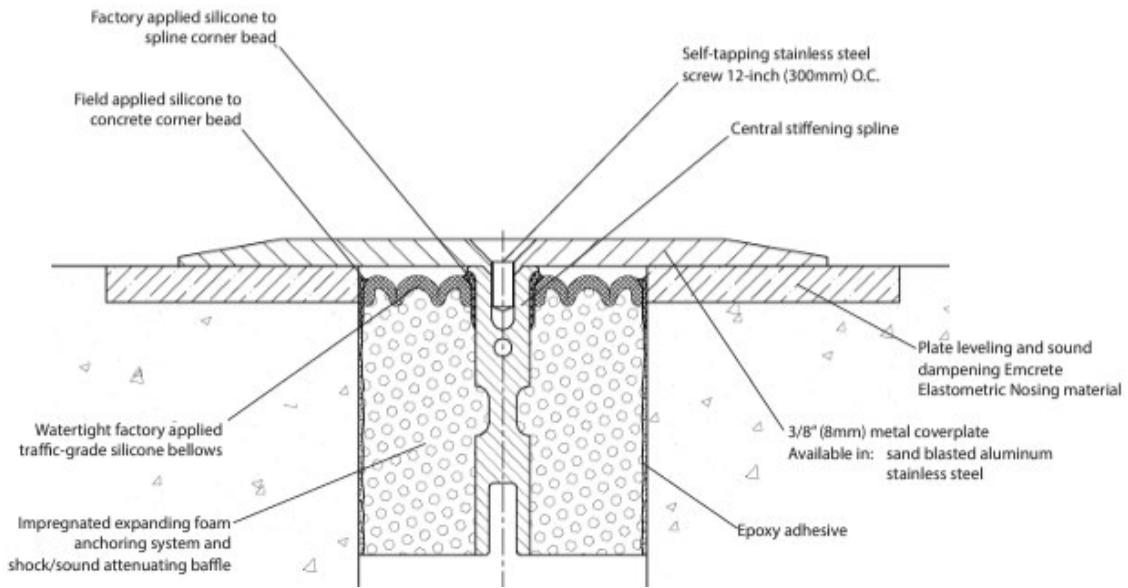


Figure 7-21. Seismic Joint System

At other locations, maintaining channels in service exiting the Grit Facility does not allow for saw cutting of a larger joint width. At these locations, it is recommended that a secondary joint be constructed outside of the existing joint to maintain watertightness if concrete spalling occurs at the existing joint interface due to pounding together of the two adjacent structures. Excavating under the pile-supported influent channels to the downstream facilities is required to install a seismic joint with higher movement capacity below those structures.

At the expansion joint between the Pump Station and the Grit Facility, the walls and roof structures are provided with 4-inch gaps between the concrete elements as shown in Figure 7-22. The sliding plates in these joints lose contact with the adjoining facility after a 3-inch relative movement, which is more than required.

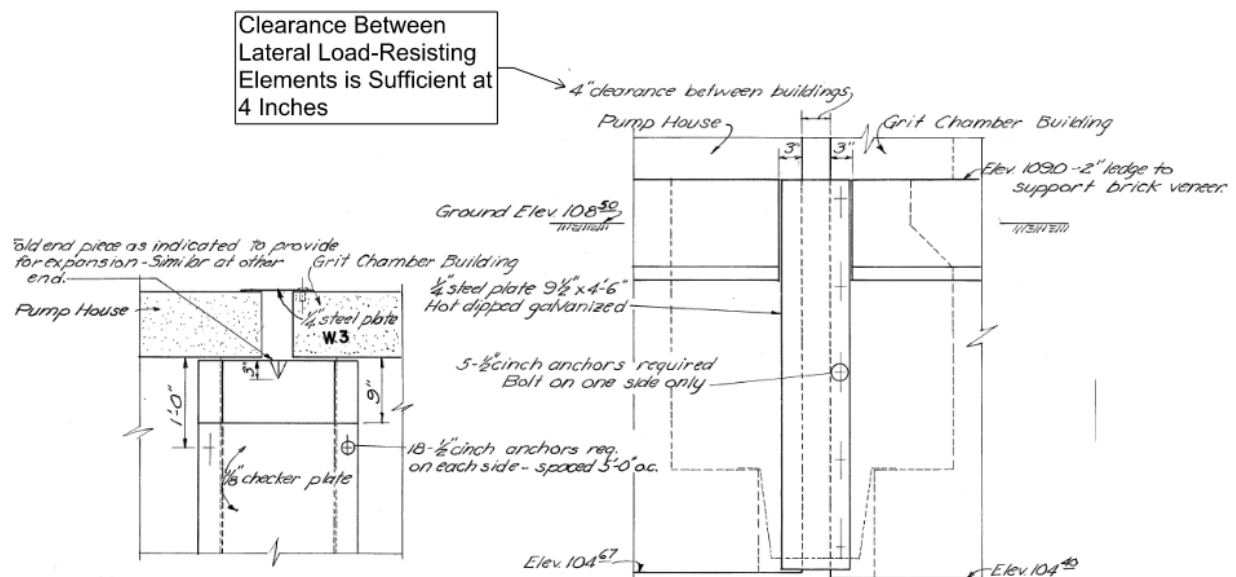


Figure 7-22. Original Expansion Joint Details at the Elevation 109 Ground Floor Level

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There are elements that cross this expansion joint, however, that do not have the requisite movement capacity and may experience damage in a seismic event. Figure 7-23 shows two elements that could be impacted at the northwest corner of the Pump Station. Retrofits to provide additional movement capacity will be incorporated as this stair can provide emergency egress from the Grit Facility out a nearby door to the exterior in the Pump Station.

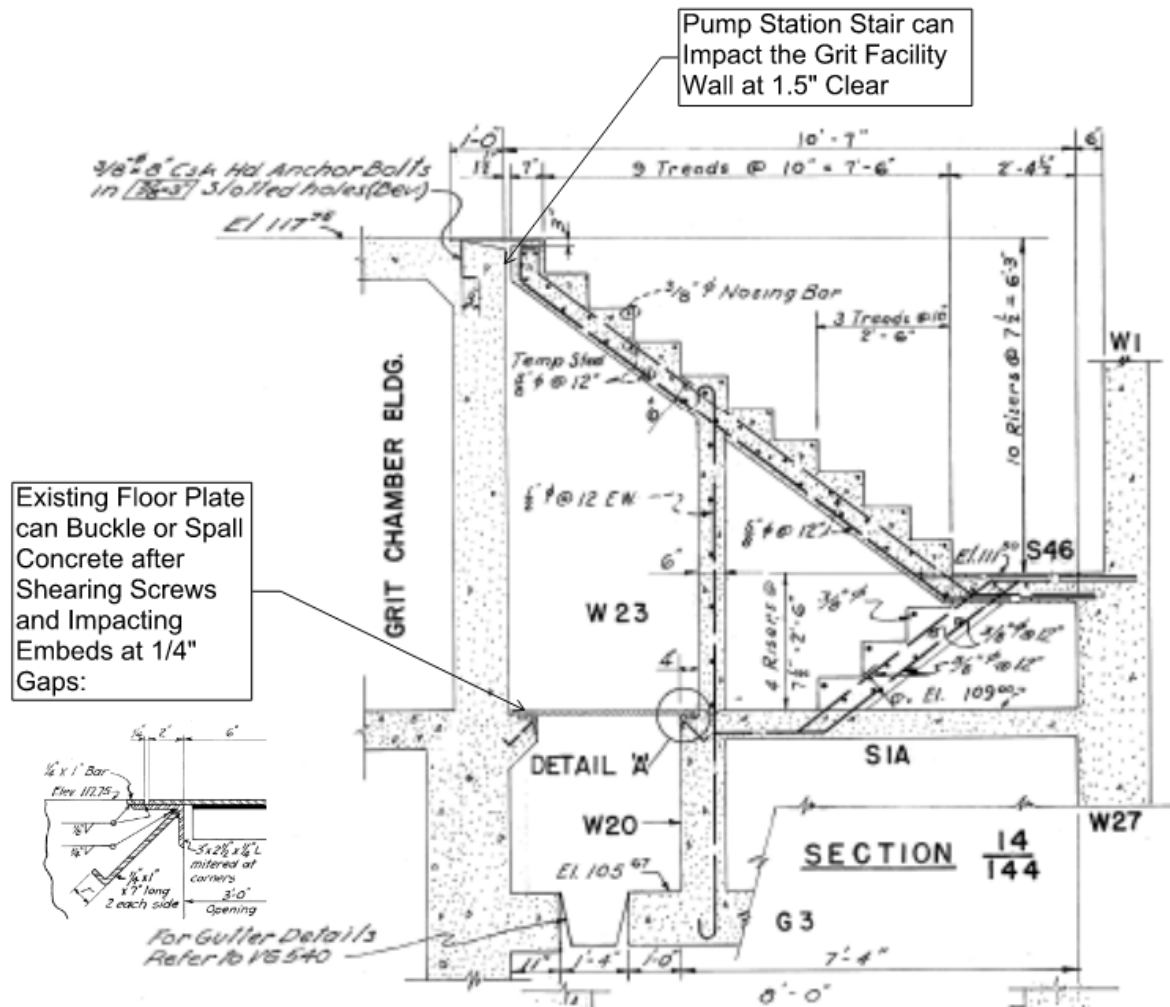


Figure 7-23. Elements with Insufficient Capacity for Expansion Joint Displacements

The 48-inch pipes crossing between the Pump Station and Grit Facility are also not provided with sufficient movement capacity to prevent damage. Figure 7-24 shows three of the five pipes crossing the expansion joint and the locations of the flexible couplings at the joint. Typical flexible couplings offer a 1/2" axial movement capacity, which is not sufficient to prevent the ends of the pipes from contacting in an earthquake. When that movement is exceeded at the IPS, the pipe can push into the end plate shown in Figure 7-25 and buckle the steel plate and/or fracture the anchor bolts. That could potentially result in significant leakage from the open channel. Flexible coupling replacement is required to provide sufficient movement capacity to preclude damage.

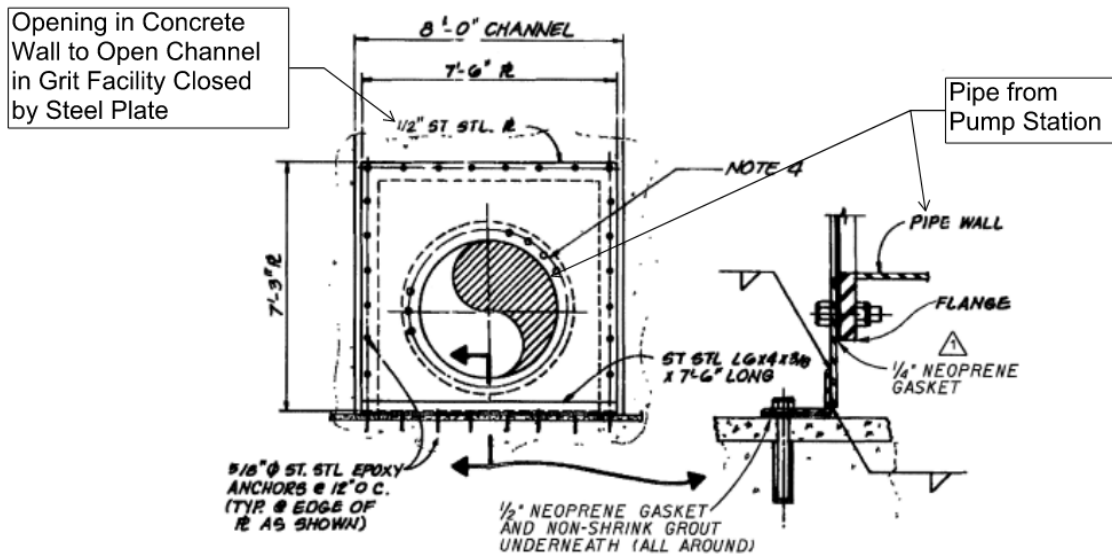


Figure 7-24. Transition from Pipe to Open Channel at Grit Facility

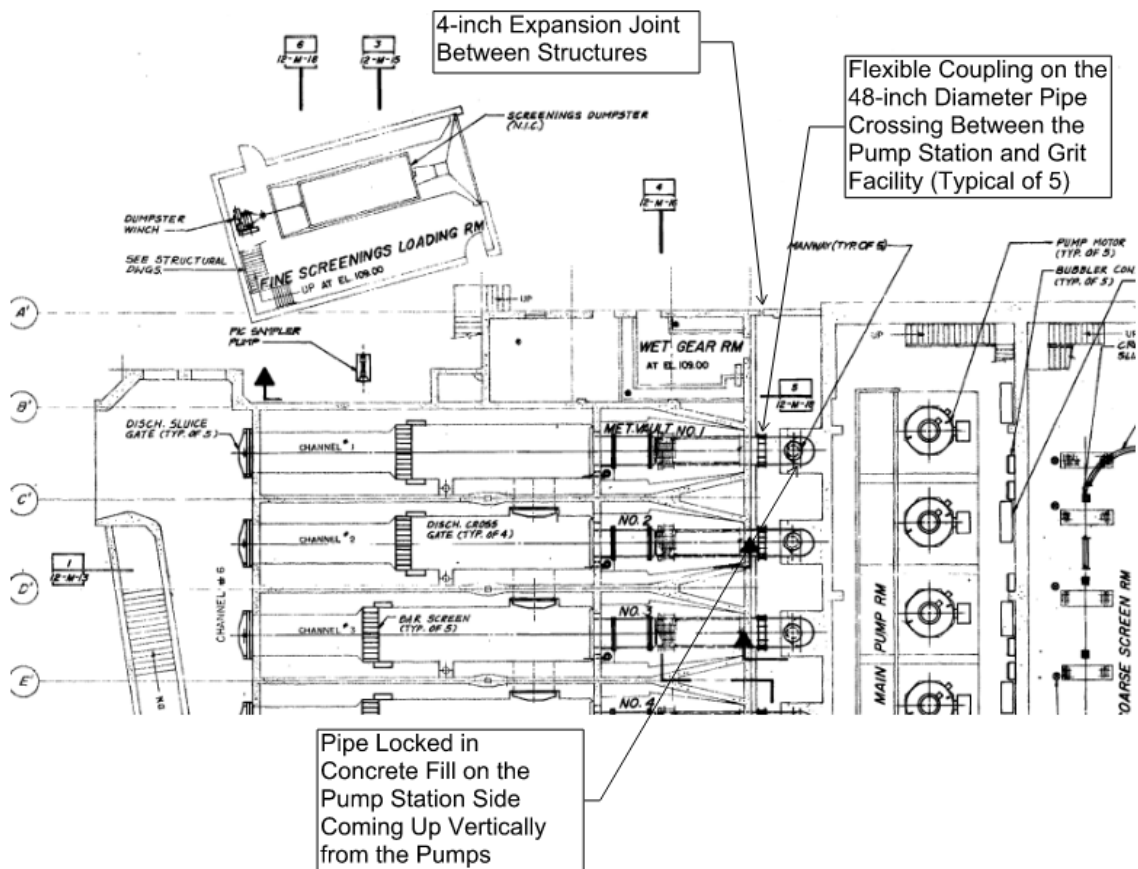


Figure 7-25. Pipes Crossing the Expansion Joint

7.8 Anchorage of Nonstructural Equipment

Anchorage of several nonstructural components is required to meet the performance objectives. The anchorage of the five main pumps in the Pump Station requires improvement to meet the Position Retention requirements under the BSE-1E seismic hazard level and the Hazards Reduced requirements under the BSE-2E. Figure 7-26 shows planned retrofits to the pump anchorages.

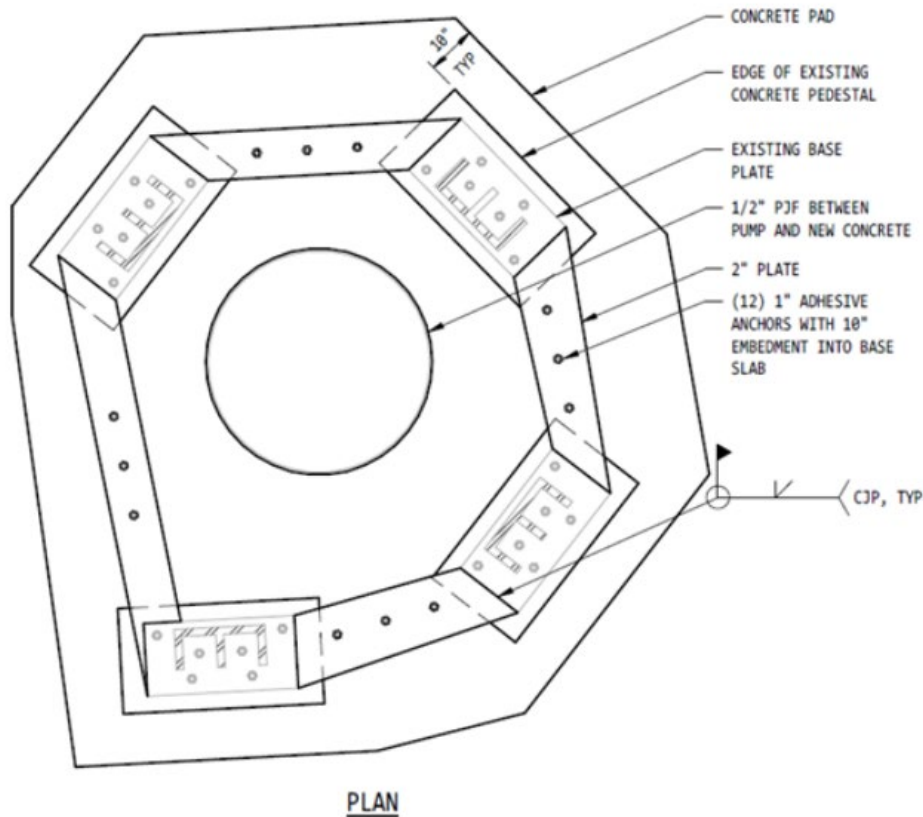


Figure 7-26. Main Pump Anchorage Retrofit

The anchorage of the fine screens in the Grit Facility also requires improvements to meet the performance objectives. Figure 7-27 shows the planned retrofit for the screens to supplement the existing anchorage.

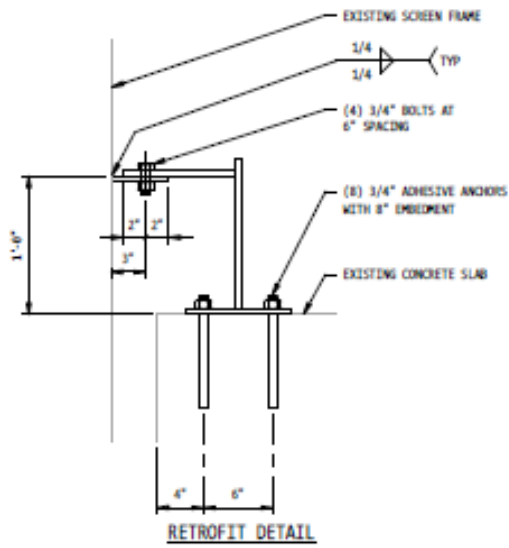


Figure 7-27. Fine Screens Anchorage Retrofit

7.9 Construction Considerations

The construction considerations include the following:

1. The IPS facility must remain operable and occupied during all construction activities.
2. Contractor access to the site is limited to Monday through Friday 8-hour day shifts for scheduling and construction cost determination. Extended hours may be utilized if required to manage the shut down periods allowed due to changed conditions.
3. No shutdowns or reduction in pumping capacity between October 1 and April 30.
4. Two pump trains can be shut down in the dry weather period (three trains remain operable) during May 1 to September 30.
5. Solids conveyor and load out facility needs to remain operable during construction.
6. Exterior Pile Cap and Pile Installation Criteria:
 - a. No abnormal noise controls.
 - b. No known contaminated soils.
 - c. Auger Cast Piles will be used for pile installation.
 - d. Buried utilities will need to be relocated.
7. Pumping Channel Retrofit Criteria (strengthening around the cross gates):
 - a. Only two channels can be taken down during dry weather; no channels can be shut down during wet weather.
 - b. Contractor will need to dewater and clean the channels as part of the work.
8. Concrete wall overlay will require localized removal and replacement of the exterior EIFS.
9. Braced Frame Requirements and Assumptions:
 - a. Retrofit at braced frames will require temporary power, controls, piping, and wiring setup so that the conduit can be removed to complete the retrofit.

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- b. Existing paint will need to be cleaned and prepped for recoated, coating will need to be removed where field welding occurs. Paint system will be a high build epoxy.
- c. Braced frames (columns, beams, connections, braces) will need to be repainted where accessible. Coatings that are not accessible due to the presence of brick veneer or precast panels will not be replaced.
- d. No known lead paint in the IPS.
- e. Braced frame columns and beams need to remain in place during the retrofit. For example the new column base plate would be installed in two pieces, welded together, and overlaid on top of the existing baseplate.

7.10 Cost Estimate Summary

A class 5 cost estimate was completed for the seismic retrofit. The major costs for the retrofit are the piles and associated earthwork followed by the concrete overlays. A detailed cost estimate is included in Attachment 2. The costs assume work would be completed in 2 years from 2024-2025. The estimated range of costs are:

Class 5 Estimate	Low Range	Estimate	High Range
Seismic Retrofit	\$5,810,000	\$11,610,000	\$23,220.00

Cost estimate has been escalated to the mid-point in construction. Add 5% per year, compounded annually for years beyond 2024.

7.11 Construction Schedule

The construction schedule is driven by the construction considerations described in Section 7.7. The key drivers are maintaining operation of the IPS during construction, limiting reduction of pumping capacity to the dry weather season, and providing enough float in the schedule to accommodate unforeseen delays that if not appropriately planned for could result in reduced pumping capacity during the wet weather season. The following is a high-level construction schedule. A more detailed construction schedule is included in Attachment 3. Note that the retrofit work will require the pumping channels to be shut down as part of the work and the proposed construction schedule is for an independent structural retrofit project. In the task 8 implementation plan a construction schedule is presented that combines these outages with the required outages for replacing the pump drives and motors. For example pump trains 3 and 4 would be shut down to replace the drives, motors, and seismically retrofit channels 3 and 4 to meet the limitation of two pump trains maximum shut down during the dry period.

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Table 7-3. Construction Sequencing

Retrofit Task	Year 1 January – April	Year 1 May – September	Year 1 October – December	Year 2 January – April	Year 2 May – September	Year 2 October – December
Submittals	X					
Prep for Channel Retrofits	X	X				
Retrofit Channel 1,2,3,4		X				
Retrofit Channel 5,					x	
Braced Frame Retrofit	x	x				
Concrete Wall Overlays		X	X	X	x	
Roof Diaphragm Retrofits				X	x	
Relocate Buried Utilities		X				
Piles and Pile Cap		x	x	X		
Punch List Items and Project Closeout						X

8. Further Numerical Analysis Recommendations

Once the seismic performance criteria are established for the final retrofit design, the maximum ASCE 41-17 DCR remaining with the capacity not modified by an m-Factor can be utilized to calculate new C_1 and C_2 factors. Those calculations then validate that the expected reductions from the tabulated values for typical treatment plant structures are achieved as considered in the preliminary retrofit design.

In order to refine the retrofit design of the pile-supported Grit Facility, the use of nonlinear pushover analyses in the north-south and east-west directions are recommended for the next phase of design. Those analyses would more accurately reflect force redistributions in the structure resulting from addition of 24" CIDH piles to the exterior of the existing structure. The nonlinear pushover analyses would also verify the force redistribution between the lightly reinforced channel training walls and the original walls between the channels to verify that no significant damage would occur.

Nonlinear pushover analyses can also be utilized to develop fragility curves for the structure. Figure 8-1 shows a typical curve (FEMA 2018), which relates the probability of collapse (or other damage levels) to the seismic demand in the form of the acceleration imparted at the fundamental period of vibration of the structure. Fragility curves can be useful in evaluating the overall seismic risks to the wastewater system that includes the influent piping.

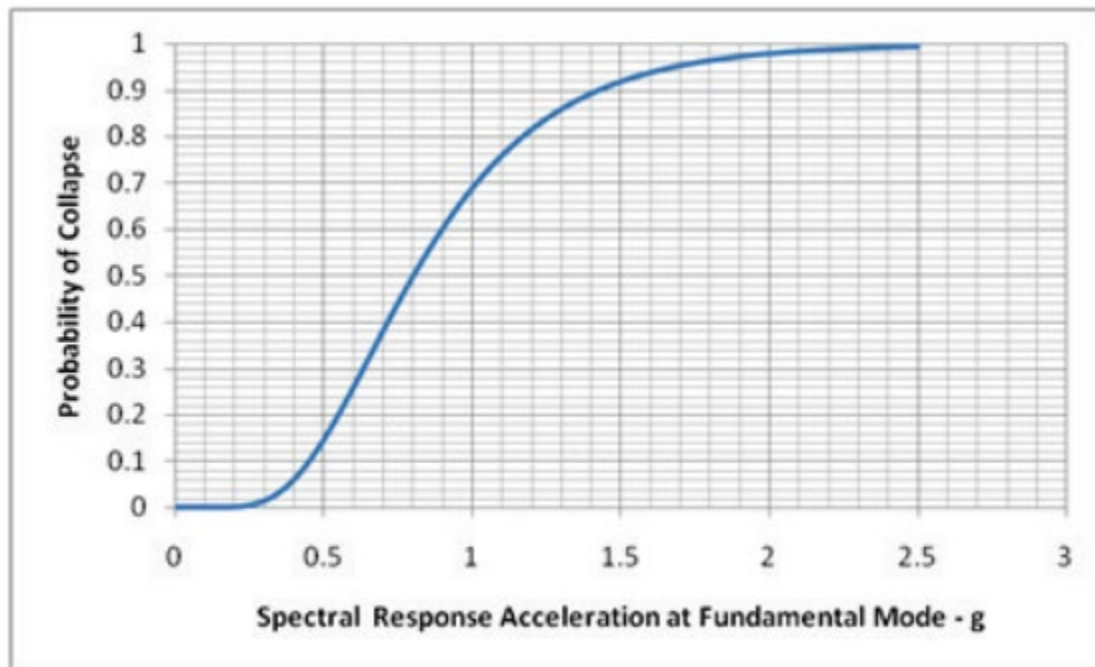


Figure 8-1. Example Fragility Curve

For the other structures comprising the IPS, nonlinear pushover analyses provide less benefit to refining the retrofit design. They can be used to verify the deformation-controlled response of the slabs in the Pump Station, with the impacts of the original one-way bending design on the concrete reinforcing explicitly accounted for in the modeling.

9. Other Alternatives Considered

Other alternatives were considered to mitigate the foundation deficiencies including deep soil-mixing and jet grouting to improve the resistance afforded by the existing piles and passive soil resistance against the existing pile caps. It was concluded that ground improvements would not reduce the loads to the piles enough to mitigate damage without significantly impacting operation of the facility and costing more than the piles shown in the retrofit concept therefore, this concept was dismissed. Consideration of additional shear walls outside of the building and in line with the Grit Facility braced frames was also considered and determined to more be costly than the steel frames retrofit.

10. Conclusions

The proposed seismic retrofit of the IPS will bring the IPS up to an Enhanced performance objective level. As the response spectra are the same for low periods between new and existing building hazard levels, it is recommended that those performance criteria be stated to apply to the BSE-1N and BSE-2N hazard levels in the next phase of design. With calculated structural periods in that range for the IPS, no changes to the preliminary retrofit design are expected. That retrofit consists of the following elements:

1. Strengthening the roof diaphragm around the existing roof openings, including added concrete and steel beams and additional welding of metal roof deck
2. Applying concrete wall overlays on select concrete shear walls
3. Applying fiber-reinforced polymer strengthening systems on select concrete shear walls
4. Applying fiber-reinforced polymer confinement of main Pump Station columns
5. Strengthening of the braced frame connections, columns, and collector beams in the fine screening room
6. Strengthening of the pumping channel walls at the cross gates with FRCM
7. Adding anchors to secure the brick veneer to the supporting concrete wall
8. Adding anchors and strengthening the connections between the precast concrete walls and braced frames in the fine screening room
9. Placing pile caps and piles at the northern, western, and southern sides of the IPS Grit Facility
10. Increasing capacity for movement at expansion joints, including in the five pipes exiting the pumps into the Grit Facility
11. Modifying equipment anchorages and adding bracing

While the IPS could be retrofitted to the lower-level Basic performance objective, only modest increases were required to achieve the Enhanced performance objective. To utilize the Basic performance objective, the following retrofits could be eliminated:

1. Strengthening ground floor beams at the Pump Station with FRP
2. Adding roof beams at the upper roof of the Pump Station
3. FRP retrofit of the pier at Grid Line C3 at the Pump Station

While the added piles at the Grit Facility could be slightly reduced in number for the Basic performance objective, those piles add to the control of displacements at the expansion joints between structures so that eliminating some is not recommended. Overall, the cost reductions down to the Basic performance objective would be expected to be less than \$70,000.

The retrofits have been designed to be constructed in an operating facility but will require shutdown of the pumping channels. The work is being proposed to be scheduled so that two channels are shutdown at a time during the dry season. The channel shutdowns are coordinated with pump train shutdowns during the Load Commutated Inverter Drives and pump motor replacements. The work also requires relocation of conduit to allow access to the braced frames as well as relocation of buried conduit to clear the area for new piles and pile caps on the outside of the IPS.



EXHIBIT G
ENVIRONMENT, HEALTH, SAFETY AND SECURITY
CHECKLIST

ENGINEERING PROJECT ENVIRONMENTAL, HEALTH, SAFETY AND SECURITY CHECKLIST

Spec Number/Project Name: _____

Project Engineer Name and Extension: _____

Brief Summary of Project: _____

This checklist is intended as an aid to engineering staff during the early stages of project development to ensure environmental, health, safety and security issues are addressed. Please return Checklist to Carla Cartagena, MS 704

A meeting is required with RCO in the early stage of the project to discuss potential environmental, health, safety, and/or security issues and proposed mitigations. The meeting should be held when enough information is known about the project to address these issues, but early enough that changes can be made. Required attendees are the design PE, PM, WHS, ECS, and SEP. Has this meeting been scheduled?

Yes No

General Questions

Will any structures or buildings be demolished as part of this project?

Yes No Unknown

Will there be any removal of materials with asbestos, lead or PCBs?

Yes No Unknown

Workplace Health and Safety Issues

Will the project create or generate hazardous dust, fume, mist, gases, or vapors in any way that could expose workers: for example, Lead, Asbestos, PCB, or any other chemical substances?

Yes No Unknown

Will the project involve working at heights over six feet above or below grade?

Yes No Unknown

Will the project require trenching or excavating?

Yes No Unknown

Will personnel be required to enter confined spaces such as vaults, pipes, manholes, tanks, tunnels, trenches, etc.?

Yes No Unknown

Will the work involve the installation of electrical service over 600 volts?

Yes No Unknown

Will there be work that requires a diver for either inspection or construction?

Yes No Unknown

Will the work be located over a body of water such as a river or lake or bay?

Yes No Unknown

Will there be any tunneling or pipe jacking?

Yes No Unknown

Will there be any abrasive blasting of coatings or surfaces?

Yes No Unknown

Will there be any spray coating of surfaces?

Yes No Unknown

Will there be any work involving the draining, cleaning, purging, or decontaminating of systems or structures once used to store, process, or convey hazardous materials?

Yes No Unknown

Security Issues

ENGINEERING DEPARTMENT PROJECT DESIGN
ENVIRONMENTAL, HEALTH, AND SAFETY AND SECURITY COMPLIANCE CHECKLIST
(Continued)

- | | | | |
|--|------------------------------|-----------------------------|----------------------------------|
| Is the work being performed at a critical facility? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will the facility be in-service during construction? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Are Contractor badges required during construction per the Construction Security Guidelines? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will guard services be required during construction? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Have physical security improvements been integrated into design in accordance with Physical Security Design Guide: | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| <ul style="list-style-type: none"> • Fencing and or walls • Physical barriers (bollards / K rail) • Security keypads (C*Cure) and locks • Video security systems • Contact alarms | | | |

Environmental Issues

- | | | | |
|--|------------------------------|-----------------------------|----------------------------------|
| Is an environmental site assessment (phase I/phase II) required for the project? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any water, wash water, or wastewater be disposed of to the storm sewer, sanitary sewer or receiving water (creek, stream, lake, bay, or other body of water) from this project during construction other than storm water runoff? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any water, wash water, or wastewater be used for multiple uses, beneficial reuse (soil compaction, street sweeping, dust control, percolation, low-impact development features or irrigation)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any soil be off hauled or reused from this project? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any hazardous materials be stored at the project site during construction for more than 30 days (e.g., diesel tanks, temporary chemical tanks)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any known or suspected hazardous materials be removed and disposed of from this project (e.g., treated wood, chemical storage tank residue, PCB, mercury, or other process or lab chemicals)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any underground or aboveground tanks and/or associated piping be installed or removed during this project? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will any work be done in or adjacent to a stream, lake, river, or other water body? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Does the project contain potential for erosion impacts to nearby water bodies during construction? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will monitoring wells be installed or removed under this project? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |
| Will construction result in land disturbance of one acre or more? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Unknown <input type="checkbox"/> |

ENGINEERING DEPARTMENT PROJECT DESIGN
ENVIRONMENTAL, HEALTH, AND SAFETY AND SECURITY COMPLIANCE CHECKLIST
(Continued)

Is there any known or suspected environmental (soil, soil gas or groundwater) contamination at or adjacent to this site?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Are there any reports/ information available related to site history and potential contamination onsite?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Is the project located adjacent to a freeway or highway?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Is there residential property or sensitive receptors (e.g., schools, hospitals, nursing homes) adjacent to the site?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Has a CEQA document been filed for the project?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the project use architectural coatings or other VOC containing compounds, including aerosols, during construction?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the project include installation of a boiler, generator, engine, or other equipment that combusts fuel (e.g., natural gas, diesel, gasoline, digester gas, propane)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the project include the installation of sources that can release volatile organic compounds (e.g., paint booth, parts cleaner, gasoline dispensing, other solvent usage)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Is the contractor planning to use portable generators to supply power during construction?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Does the project require vegetation management or pesticide application?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
For wastewater projects: will this work be done on the west end property?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>Post-construction Questions</i>			
Will hazardous substances (includes both hazardous materials and hazardous wastes) be stored at the newly constructed facility?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the newly constructed facility discharge water, wash water or wastewater to a storm drain or receiving water (e.g., process streams, cooling water, vehicle wash water, sump water)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the newly constructed facility discharge water, wash water or wastewater (other than sanitary waste) to a sanitary sewer?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the project include permanent installation of a boiler, generator, engine, or other equipment that combusts fuel (e.g., natural gas, diesel, gasoline, digester gas, propane)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>
Will the project include the permanent installation of sources that can release volatile organic compounds (e.g., paint booth, parts cleaner, gasoline dispensing, other solvent usage)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Unknown <input type="checkbox"/>