EAST BAY
MUNICIPAL UTILITY DISTRICT

REQUEST FOR PROPOSAL (RFP)

for SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

ADDENDA

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

CONTACT

Babak Gerami, Associate Engineer
(510) 287-1852
babak.gerami@ebmud.com

RESPONSE DUE

December 15, 2023
12:00 p.m. PST

SUBMIT ELECTRONICALLY TO*

Babak Gerami, EBMUD
babak.gerami@ebmud.com

**Hardcopy proposals will not be accepted*

EAST BAY MUNICIPAL UTILITY DISTRICT

RFP for

SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

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I. STATEMENT OF WORK

A. SCOPE

It is the intent of these specifications, terms, and conditions to describe the professional services needed for seismic retrofit; heating, ventilation, air conditioning (HVAC) systems, control systems; and fire protection systems improvements of the District's Main Wastewater Treatment Plant (MWWTP) Administration Building (AB) and Laboratory (Lab) under SD-457. See Exhibit E for the full scope of work.

The AB and Lab were built at different times and support different activities; however, they are part of one connected building. The AB is about 12,000 sf and houses offices, meeting rooms, copy rooms, a lounge, restrooms, and an electrical room. The Lab is about 28,000 square feet and includes offices, locker/restrooms, cold rooms, gas cylinder storage room, hazardous materials handling, aquatic toxicology, microbiology, inorganic chemicals lab, bioassay lab, and other water/wastewater laboratory facilities.

East Bay Municipal Utility District (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 evaluation, design work; produce construction bid documents; and support bidding and construction efforts for seismic retrofit, HVAC systems, and fire protection system improvements of the Administration Building and Laboratory located at the DISTRICT's MWWTP in Oakland, California.

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 structural and seismic evaluation and design of existing buildings or light industrial facilities located in high seismic hazard zones within the last ten (10) years.

    b. Proposer and/or proposer's team shall have been engaged in designing mechanical, electrical, and plumbing (MEP), HVAC systems, and fire protection systems for buildings or light industrial facilities for at least five (5) years.

c. Proposer and/or proposer's team shall have been engaged in seismic retrofit and HVAC systems improvement design for occupied buildings and laboratories for at least five (5) years and shall have experience in design of construction phasing and staging for similar buildings and industrial facilities.

d. Proposer's project manager (PM) assigned to this project shall have the following experience:

(1) Employee of the Lead Firm

(2) As a project manager, at least ten (10) years of experience managing multi-disciplinary projects that requires close coordination among structural, architectural, mechanical, and electrical disciplines.

(3) At least five (5) years of experience providing structural and seismic evaluation and design services for similar buildings in high seismic hazard zones.

(4) Experience in managing the preparation of multi-disciplinary bid documents for construction, including for municipal capital improvement 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) Three (3) seismic evaluation and retrofit design projects, including structural and nonstructural, for similar buildings or facilities resulting in the production of bid documents for construction, completed within the last ten (10) years. Projects shall have had a consultant contract value over $750,000.

(2) Three (3) HVAC systems improvement design projects for similar buildings or facilities, resulting in the production of bid documents for construction completed within the last ten (10) years.

(3) Three (3) fire protection and fire alarming systems improvement design projects for similar buildings or facilities, resulting in the production of bid documents for construction completed within the last ten (10) years.

(4) Three (3) seismic evaluation and retrofit design project for similar buildings or facilities, including engineering services during construction, completed within the last ten (10) years.

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) 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 engineering services as specified under this RFP.

C. SPECIFIC REQUIREMENTS

This project consists of the design of seismic retrofit, HVAC systems and fire protection system improvements; preparation of contract documents for administration and laboratory building in two construction packages; development of construction phasing and staging requirements (developed during the design phase); engineering services during the bid period; and engineering services during construction after award of the construction contract.

The overarching goals of the project are to:

- Reduce seismic risks and
- Provide life safety and operational resiliency in the event of a major seismic event.
- Provide high air quality and reliable temperature control.
- Minimize impacts to administrative and laboratory staff and equipment during construction.

The following is an outline of tasks for this project. See Exhibit E for full Scope of Work.

Task 1	Project Management
Task 2	Quality Assurance and Quality Control
Task 3	Data Collection and Condition Assessments
Task 4	Preliminary Design
Task 5	Detailed Design
Task 6	Evaluation and Design Data and File Management
Task 7	Bid Period Services
Task 8	Engineering Services During Construction
Task 9	Optional Services

The scope of work requires an independent peer review (IPR) of all seismic design tasks. The consultant shall designate a subconsultant to perform the IPR which shall be independent from the consultant's design and QA/QC efforts.

The planning design phase will involve the collection and review of existing documents and data, on-site investigations, and condition assessment of the existing facility to support the evaluation and design efforts.

Preliminary design will involve defining the project criteria, identifying seismic vulnerabilities and HVAC systems deficiencies, developing preliminary design of improvements, identifying project constraints, planning the construction phasing, and staging, addressing District and User Group input, and preparing the Preliminary Design Report that will serve as the basis of design for the project.

Development of a construction phasing and staging plan for the occupied spaces is considered critical to the success of this project. The Lab is an essential facility and must remain in operation throughout construction.

Following the preliminary design phase, detailed design will be performed with submittals at 50%, 100%, and Final completion. User Group meetings with District operations and maintenance staff will be held at each phase of design and as needed, to solicit feedback and address concerns. Management briefings with District Management will be held to confirm agreement at each phase of design and as needed.

The Consultant will then provide bid period services after the contract documents are advertised, and engineering services during construction (ESDC) after the contract is awarded.

D. DELIVERABLES / REPORTS

1. See Exhibit E – Scope of Work.

II. CALENDAR OF EVENTS

EVENT	DATE/LOCATION	
RFP Issued	November 2, 2023	
Proposal Conference (Mandatory)	November 15, 2023 at 10:30 AM on Microsoft Teams	Please email babak. gerami@ebmud.com for a video conference invitation link.
Site Walk (Mandatory)	November 17, 2023 at 1:30 PM at MWWTP Entrance	Please email babak. gerami@ebmud.com for meeting details and requirements.
Addendum (if necessary)		
Response Due	December 15, 2023	
Interviews	January 15 -19, 2024	
Anticipated Contract Start Date	March 28, 2024	

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

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 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.	**Firm(s) Experience:** The evaluation will consider the type of projects completed and compare the extent of experience of Proposer's team on the following areas: 1- Seismic evaluation and retrofit design for existing buildings. 2- HVAC systems and fire protection systems upgrade for occupied building or similar facilities. 3- Design of construction sequencing/scheduling experience for occupied building or similar facilities. References will be contacted to address the questions above. The District will make a reasonable effort to reach each Reference. The District will call and email each reference at least twice, after which if no response is received the reference will be deemed invalid. It is the Proposer's responsibility to verify their References are reachable at the provided contact information.
B.	**Key Personnel:** The evaluation will assess the quantity, qualifications and experience of personnel proposed for this project, and against the questions below: 1. Project Manager - Does the PM demonstrate effective leadership skills? Does the PM have experience managing projects with similar scope to the requested service? Does the PM have experience working with the project team and subconsultants? 2. Project Team - Do the individuals assigned to the project have experience on similar projects? Do they have the appropriate licensing to perform the work? 3. Are résumés complete and do they demonstrate backgrounds that would be desirable for individuals engaged in the work the project requires? 4. How extensive is the applicable education and experience of the personnel designated to work on the project? 5. Does the project team have the availability, proximity, and responsiveness to perform the work?

C.	**Understanding of the Project:** RFP responses will be evaluated against the RFP specifications and the questions below: 1. Has the Proposer demonstrated a thorough understanding of the purpose and scope of the project? 2. How well has the Proposer identified pertinent issues and potential problems related to the project? 3. Has the Proposer demonstrated that it understands the deliverables the District expects it to provide? 4. Has the Proposer demonstrated that it understands the District's time schedule and can meet it?
D.	**Approach:** The proposed approach to services during design and construction will be evaluated. This includes approach(es) to preparing contract drawings and specifications that result in minimizing impacts to building occupants during construction, achieving effective seismic retrofit and HVAC systems upgrade designs, reducing bid uncertainties for a lowest-bid contractor selection system, and meeting District's schedule. Additional credit will be given for the identification and planning for mitigation of schedule risks which the Proposer believes may adversely affect the District's schedule.
E.	**Oral Presentation and Interview:** The oral presentation will be evaluated based on: 1. Proposed team's ability to present their proposal in an organized, concise, and timely manner. 2. Project Manager's demonstration of effective leadership. 3. Responses to standard questions and specific questions regarding the specific RFP response. ***Proposed key staff must be included as part of the interview team.***
F.	**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, and they check the appropriate box, requesting preference, in Exhibit A-Proposer Information and Acceptance. Qualified DVBEs and/or SBEs will receive an additional 5 points to their total score.

C. PRICING

1. Prices quoted shall be firm for the first twenty-four (24) months of any contract that may be awarded pursuant to this RFP.

2. All prices quoted shall be in United States dollars.

3. Price quotes shall include any and all payment incentives available to the District.

4. Proposers are advised that in the evaluation of cost, if applicable, it will be assumed that the unit price quoted is correct in the case of a discrepancy between the unit price and extended price.

D. NOTICE OF INTENT TO AWARD AND PROTESTS

At the conclusion of the RFP response evaluation process, all entities who submitted a proposal package will be notified in writing by e-mail or USPS mail with the name of the Proposer being recommended for contract award. The document providing this notification is the Notice of Intent to Award.

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

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

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

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

Protests must be mailed, hand delivered, or emailed to the Manager of Purchasing, Mailstop 102, East Bay Municipal Utility District, 375 Eleventh Street, Oakland, CA

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

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

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

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

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

E. 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: Babak Gerami, Associate Civil Engineer
EBMUD – Wastewater Department
E-Mail: babak.gerami@ebmud.com
PHONE: (510) 287-1852

FOR INFORMATION ON THE CONTRACT EQUITY PROGRAM:
Attn: Contract Equity Office
PHONE: (510) 287-0114

AFTER AWARD:
Attn: Babak Gerami, Associate Civil Engineer
EBMUD- Wastewater Department
E-Mail: babak.gerami@ebmud.com
PHONE: (510) 287-1852

B. SUBMITTAL OF RFP RESPONSE

1. Late responses will not be accepted.

2. 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 babak.gerami@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) 287-1852 to check receipt of the proposal.

3. All costs required for the preparation and submission of an RFP response shall be borne by the Proposer.

4. 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.

5. 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.

6. 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.

7. It is understood that the District reserves the right to reject any or all RFP responses.

C. RESPONSE FORMAT

1. **Proposers shall not modify the existing text for any part of Exhibits A, B, C, D, E, or F or qualify their RFP responses. Proposers shall not submit to the District a re-typed or otherwise re-created version of these documents or any other District-provided document.**

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 – SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

To: The EAST BAY MUNICIPAL UTILITY District ("District")

From: _____
(Official Name of Proposer)

RFP RESPONSE PACKET GUIDELINES

- **SUBMITTAL SHALL CONTAIN THE FOLLOWING:**
  - **EXHIBIT A – RFP RESPONSE PACKET**
    - **INCLUDING ALL REQUIRED DOCUMENTATION AS DESCRIBED IN "EXHIBIT A-REQUIRED DOCUMENTATION AND SUBMITTALS"**

- **PROPOSERS THAT DO NOT COMPLY WITH THE REQUIREMENTS, AND/OR SUBMIT AN INCOMPLETE RFP RESPONSE MAY BE SUBJECT TO DISQUALIFICATION AND THEIR RFP RESPONSE REJECTED IN WHOLE.**

- **IF PROPOSERS ARE MAKING ANY CLARIFICATIONS AND/OR AMENDMENTS, OR TAKING EXCEPTION TO ANY PART OF THIS RFP, THESE MUST BE SUBMITTED IN THE EXCEPTIONS, CLARIFICATIONS, AND AMENDMENTS SECTION OF THIS EXHIBIT A – RFP RESPONSE PACKET. THE DISTRICT, AT ITS SOLE DISCRETION, MAY ACCEPT AMENDMENTS/EXCEPTIONS, OR MAY DEEM THEM TO BE UNACCEPTABLE, THEREBY RENDERING THE RFP RESPONSE DISQUALIFIED.**

- **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 ☐ Joint Venture

☐ Limited Liability Partnership ☐ Partnership

☐ Limited Liability Corporation ☐ Non-Profit / Church

☐ Other: _____

Jurisdiction of Organization Structure: _____

Date of Organization Structure: _____

Federal Tax Identification Number: _____

Department of Industrial Relations (DIR) Registration Number: _____

Primary Contact Information:

Name / Title: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____

Street Address Line 1: _____

City: _____ State: _____ Zip Code: _____

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

☐ YES ☐ NO

If so, please list :

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

SIGNATURE: _____

Name and Title of Signer (printed): _____

Dated this _____ day of _____ 20_____

EBMUD

PROPOSAL FORM

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

No alterations or changes of any kind to the Proposal Form(s) are permitted. RFP responses that do not comply may be subject to rejection in total. The cost quoted below shall be the cost the District will pay for the term of any contract that is a result of this RFP process.

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

Description	Unit of Measure	Estimated Quantity	Unit Cost	Extended Cost
Project Manager	hour		$	$
Senior Consultant	hour		$	$
Junior Consultant	hour		$	$
			TOTAL COST	$

REQUIRED DOCUMENTATION AND SUBMITTALS

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

1. **Letter of Transmittal**: RFP response shall include a description of the Proposer's capabilities and approach in providing its services to the District, and provide a brief synopsis of the highlights of the RFP response and overall benefits to the District. 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 no more than two (2) pages in length, and be signed by an individual having authority to execute an agreement with EBMUD.

The RFP response to the following sections 2, 3 and 4 shall be no longer than 15 pages in length, in total for the three sections together.

2. **Firm Experience**: RFP response shall include a description of the Proposer's experience and qualifications for providing services for this project. Description shall contain information on similar type of projects completed. Description for the qualifying projects must include client name, scope highlights, year completed, contract fee, lead firm name, and contact information.

3. **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;
   (d) The person's relevant experience, certifications, and/or merits; and
   (e) The person's telephone number, fax number, and e-mail address.

   For the Consultant's project manager, elaborate on how the project manager:

   - 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 the Independent Peer Reviewer.
- Coordinate and work effectively with subconsultants and, Contractors.

Provide resumes in an appendix to the RFP response, for all the key project personnel.

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.

4. **Project Approach**: The proposal must include a clear and complete discussion on how each Task in Exhibit E will be completed with sufficient detail. In general, the project approach should demonstrate the following:

1. Proposer's adequate resources and expertise to complete the work.
2. Proposer's extensive knowledge of seismic evaluation and retrofit design of structural and non-structural components, comparable to the scope of work.
3. Proposer's extensive knowledge of MEP, HVAC systems and fire protection systems design and construction, comparable to the scope of work.
4. Proposer's extensive knowledge of construction phasing, staging, sequencing and scheduling of construction, comparable to the scope of work.
5. Proposer's extensive knowledge on coordinating and managing multi-disciplinary projects.
6. Proposer's extensive experience providing engineering bid evaluation, and engineering services during construction to utilities similar to the District.

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 the 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. **References:**

(a) Proposers must use the templates in the "References" section of this Exhibit A – RFP Response Packet to provide references.

(b) References should have similar scope, volume, and requirements to those outlined in these specifications, terms, and conditions.

- Proposers must verify the contact information for all references provided is current and valid.
- Proposers are strongly encouraged to notify all references that the District may be contacting them to obtain a reference.

(c) The District may contact some or all of the references provided in order to determine Proposer's performance record on work similar to that described in this RFP. The District reserves the right to contact references other than those provided in the RFP response and to use the information gained from them in the evaluation process.

6. **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 Proposer. The Proposer may use the table provided below as a template.

	Estimated Labor Hours by Task			**Total Hours per Task**
	Project Manager	Project Engineer	… (Add column for each appropriate role)	
Task 1				(Sum hours for this task)
Task 2				
… (add a new row for each Task in Exhibit E)				
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)

7. **Exceptions, Clarifications, Amendments:**

(a) The RFP response shall include a separate section calling out all clarifications, exceptions, and amendments, if any, to the RFP and associated RFP documents, which shall be submitted with the proposer's RFP response using the template in the "Exceptions, Clarifications, Amendments" section of this Exhibit A – RFP Response Packet.

(b) **THE DISTRICT IS UNDER NO OBLIGATION TO ACCEPT ANY EXCEPTIONS, AND SUCH EXCEPTIONS MAY BE A BASIS FOR RFP RESPONSE DISQUALIFICATION.**

8. **Contract Equity Program:**

(a) Every proposer must fill out, sign, and submit the appropriate sections of the Contract Equity Program and Equal Employment Opportunity documents located at the hyperlink contained in the last page of this Exhibit A. Special attention should be given to completing Form P-25, "Employment Data and Certification". Any proposer needing assistance in completing these forms should contact the District's Contract Equity Office at (510) 287-0114 prior to submitting an RFP response.

EBMUD

REFERENCES

RFP For SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

Proposer Name: ______________________________

Proposer must provide a minimum of three (3) references.

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

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

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

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

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

EXCEPTIONS, CLARIFICATIONS, AMENDMENTS

RFP For SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

Proposer Name:_____

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

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

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

EXAMPLE

*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

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, CONSULTANT shall, at its sole cost and expense, maintain insurance in conformance with the requirements set forth below.

B. CONSULTANT shall provide Verification of Insurance as required by this Agreement by providing the completed Verification of Insurance as requested below signing and submitting this Exhibit C to the DISTRICT. The Exhibit C may be signed by an officer of the CONSULTANT (Agent), by the Insurance Broker for the CONSULTANT or by CONSULTANT's Risk Manager. CONSULTANT shall update Exhibit C throughout the specified term of the insurance required by this Agreement by resubmitting the completed Exhibit C prior to the expiration date of any of the required insurance. The updated Exhibit C shall become a part of the Agreement but shall not require a change order to the Agreement. The Notice to Proceed shall not be issued, and CONSULTANT shall not commence Services until such insurance has been accepted by the DISTRICT.

C. CONSULTANT shall carry and maintain the minimum insurance requirements as defined in this Agreement. CONSULTANT shall require any Subcontractor to carry and maintain the minimum insurance required in this Agreement to the extent they apply to the scope of the services to be performed by Subcontractor.

D. Acceptance of Verification of Insurance by the DISTRICT shall not relieve CONSULTANT of any of the insurance requirements, nor decrease liability of CONSULTANT.

E. 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.

F. Any deductibles, self-insurance, or self-insured retentions (SIRs) applicable to the required insurance coverage must be declared to and accepted by the DISTRICT.

G. At the option and request of the DISTRICT, CONSULTANT shall provide documentation of its financial ability to pay the deductible, self-insurance, or SIR.

H. CONSULTANT is responsible for the payment of any deductibles or SIRs pertaining to the policies required under this Agreement. In the event CONSULTANT is unable to pay the required SIR, CONSULTANT 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).

I. 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.

J. CONSULTANT 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.

K. 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 and must be before the date of this Agreement, and before the beginning of any Services related to this Agreement.

L. Insurance must be maintained and updated Verification of Insurance be provided to the DISTRICT before the expiration of insurance by having CONSULTANT's insurance broker or agent update, sign and return Exhibit C to the DISTRICT's contract manager. For all claims-made policies the updated Verification of Insurance must be provided to the DISTRICT for at least three (3) years after expiration of this Agreement.

M. If claims-made 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 this Agreement or the start of any Services related to this Agreement, CONSULTANT must purchase an extended reporting period for a minimum of three (3) years after expiration of the Agreement.

N. In the event of a claim or suit, and upon request by the DISTRICT, CONSULTANT agrees to provide a copy of the pertinent policy(ies) within 10 days of such request to the DISTRICT for review. Notwithstanding the foregoing, the DISTRICT may, at any time during CONSULTANT'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 CONSULTANT hereunder, whether or not a suit or claim has been filed. Premium details may be redacted from any such documents requested.

O. 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.

P. 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.

Q. CONSULTANT agrees to provide immediate Notice to the DISTRICT of any loss or claim against CONSULTANT arising out of, pertaining to, or in any way relating to this Agreement, or 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 or claims if they are likely to involve the DISTRICT.

R. It is the obligation of the CONSULTANT to ensure all Contractors/Subcontractors it hires to perform services under this Agreement maintain the necessary coverages and limits, as well as indemnity provisions indemnifying the DISTRICT, based on the nature and scope of services being performed by each Contractor/Subcontractor. CONSULTANT 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 CONSULTANT under this Agreement. Failure or inability to secure fully adequate insurance shall in no way relieve the CONSULTANT or Subcontractor of the responsibility for its own acts or the acts of any

Subcontractors or any employees or agents of either. All Subcontractors are to waive subrogation against the DISTRICT on all policies. CONSULTANT 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.

S. It is CONSULTANT'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.

T. 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 CONSULTANT, should CONSULTANT 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 CONSULTANT's insurance broker or agent update, sign and return this Exhibit C.

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 CONSULTANT, Subcontractor, and/or 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 CONSULTANT is exempt from carrying Workers' Compensation Insurance, CONSULTANT must return the completed Verification of Insurance confirming that CONSULTANT has no employees and is exempt from the State of California Workers' Compensation requirements.

D. If CONSULTANT is self-insured with respect to Workers' Compensation coverage, CONSULTANT 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 CONSULTANT 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. CONSULTANT 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 CONSULTANT'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 CONSULTANT is exempt from the State of California's requirement to carry Workers' Compensation insurance.**

As the CONSULTANT's insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

III. Commercial General Liability Insurance ("CGL") Coverage

A. CONSULTANT'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 CONSULTANT.

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 CONSULTANT and/or 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 Subcontractor on CONSULTANT's behalf.

H. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONSULTANT 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 CONSULTANT 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. CONSULTANT 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 CONSULTANT'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 CONSULTANT, 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 CONSULTANT'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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

IV. Business Auto Liability Insurance Coverage

A. CONSULTANT'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 CONSULTANT.

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 CONSULTANT 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 CONSULTANT'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 CONSULTANT's and/or 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 CONSULTANT'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 CONSULTANT'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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

Insurance Broker/ Risk Manager or Agent'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 CONSULTANT.

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, CONSULTANT must purchase an extended period of coverage 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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

Insurance Broker/ Risk Manager or Agent'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. CONSULTANT'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 CONSULTANT.

D. Minimum Requirements: It is expressly understood by the parties that CONSULTANT'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 Subcontractor on CONSULTANT's behalf

4. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONSULTANT 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 CONSULTANT, 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 CONSULTANT'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. CONSULTANT 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 CONSULTANT 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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

EXHIBIT C
CONSULTING AND PROFESSIONAL SERVICE AGREEMENT

Note: Exhibits A, B, and C contained within the RFP's Exhibit C are not related to the RFP. All documents under Exhibit C are provided for reference only.

(Standard Consulting Agreement for
Contracts Greater than $80,000 - Revised 6/2/2021)
(Note: Reference District Procedure No. 451)

CONSULTING AND PROFESSIONAL
SERVICES AGREEMENT FOR
EAST BAY MUNICIPAL UTILITY DISTRICT
(Project Title)

THIS Agreement is made and entered into this _____ day of ***(month)***, 202_, by and between **EAST BAY MUNICIPAL UTILITY DISTRICT**, a public entity, hereinafter called "DISTRICT," and ***(CONSULTANT'S FULL LEGAL NAME, BOLD, ALL CAPS followed by type of entity [corporation, etc.])***, hereinafter called "CONSULTANT."

WITNESSETH

WHEREAS, DISTRICT requires consulting services for ***(need for project)***; and

WHEREAS, DISTRICT has completed ***(completed projects that pertain to this project - optional)***; and

WHEREAS, CONSULTANT has submitted a proposal to provide consulting services for ***(state type -"preparation of planning documents", "preparation of design documents", or "construction management support services")*** for the ***(project title)*** and CONSULTANT 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

IF OVER $80,000:

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

-OR- IF BETWEEN $30,000 AND $80,000:

WHEREAS, DISTRICT has authorized the contract by approval of the General Manager.

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

ARTICLE 1 - SCOPE OF WORK

SAMPLE

1.1 CONSULTANT 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 CONSULTANT's work products shall be completed and submitted in accordance with DISTRICT's standards specified, and according to the schedule listed, in Exhibit A. The completion dates specified herein may be modified by mutual agreement between DISTRICT and CONSULTANT provided that DISTRICT's Project Manager notifies CONSULTANT of modified completion dates by letter. CONSULTANT agrees to diligently perform the services to be provided under this Agreement. In the performance of this Agreement, time is of the essence.

1.3 It is understood and agreed that CONSULTANT has the professional skills necessary to perform the work agreed to be performed under this Agreement, that DISTRICT relies upon the professional skills of CONSULTANT to do and perform CONSULTANT's work in a skillful and professional manner, and CONSULTANT thus agrees to so perform the work. CONSULTANT represents that it has all the necessary licenses to perform the work and shall maintain them during the term of this Agreement. CONSULTANT agrees that the work performed under this Agreement shall follow practices usual and customary to the ***(state type - for example "engineering")*** profession and that CONSULTANT 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 CONSULTANT from such professional responsibility for the work performed.

1.4 CONSULTANT 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. CONSULTANT 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 CONSULTANT during the term of this Agreement. The covenants contained in this paragraph shall survive the termination of this Agreement for whatever cause.

1.5 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 CONSULTANT or its subconsultants 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. CONSULTANT and its subconsultants may retain and use copies of such documents, with written approval of DISTRICT.

1.6 CONSULTANT is an independent contractor and not an employee of DISTRICT. CONSULTANT expressly warrants that it will not represent that it is an employee or servant of DISTRICT.

SAMPLE

1.7 CONSULTANT 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.

1.8 It is further understood and agreed by the parties hereto that CONSULTANT 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 the CONSULTANT for accomplishing the results.

1.9 If, in the performance of this agreement, any third persons are employed by CONSULTANT, such person shall be entirely and exclusively under the direction, supervision, and control of CONSULTANT. 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 CONSULTANT, and DISTRICT shall have no right or authority over such persons or the terms of such employment.

1.10 It is further understood and agreed that as an independent contractor and not an employee of DISTRICT, neither the CONSULTANT nor CONSULTANT'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. CONSULTANT shall not be covered by DISTRICT's worker's compensation insurance; nor shall CONSULTANT 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.

SAMPLE

ARTICLE 2 - COMPENSATION

2.1 For the Scope of Services described in Exhibit A, DISTRICT agrees to pay CONSULTANT 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. CONSULTANT 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. CONSULTANT 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, CONSULTANT 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. CONSULTANT 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.

(Include the following paragraph only if your scope of services includes Optional Services.)

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 CONSULTANT 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 CONSULTANT's delivery to DISTRICT of any and all documents, photographs, computer software, videotapes, and other materials provided to CONSULTANT or prepared by CONSULTANT 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 CONSULTANT is entitled in the event of termination of the Agreement and CONSULTANT shall be entitled to no other compensation or damages and expressly waives same. Termination under this Article 4 shall not relieve CONSULTANT of any warranty obligations or the obligations under Articles 1.4 and 7.1.

(Optional)

4.3 This Agreement may be terminated by CONSULTANT upon 10 days written notice to DISTRICT only in the event of substantial failure by DISTRICT to fulfill its obligations under this Agreement through no fault of the CONSULTANT.

ARTICLE 5 - PROJECT MANAGERS

SAMPLE

5.1 DISTRICT designates ***(District Project Manager's name)*** as its Project Manager, who shall be responsible for administering and interpreting the terms and conditions of this Agreement, for matters relating to CONSULTANT's performance under this Agreement, and for liaison and coordination between DISTRICT and CONSULTANT. CONSULTANT 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 the DISTRICT's representative, DISTRICT will notify CONSULTANT of the change in writing.

5.2 CONSULTANT designates ***(Consultant 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 CONSULTANT designated personnel or subconsultant shall be subject to approval by the DISTRICT Project Manager. ***(The following sentence is optional.)*** CONSULTANT hereby commits an average of ***(1 to 100)*** percent of ***(Consultant Project Manager's name)*** time on this project for the duration of the project.

ARTICLE 6 - CONTRACT EQUITY PROGRAM COMPLIANCE

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

(Paragraph 6.2 to be used when there is subcontracting/subconsulting opportunities. See CEP office for details.)

6.2 Designated CEP compliance for the duration of this Agreement is listed in Exhibit C, which is attached hereto and incorporated herein. CONSULTANT shall maintain records of the total amount actually paid to each subconsultant. Any change of CONSULTANT'S listed subconsultants shall be subject to approval by the DISTRICT'S Project Manager.

ARTICLE 7 - INDEMNIFICATION AND INSURANCE

(IF DEPT. WANTS TO MODIFY INDEMNITY LANGUAGE, PLEASE SUBMIT JUSTIFICATION IN WRITING TO LEGAL, CC: RISK MANAGER.)

(FOR DESIGN PROFESSIONAL CONTRACTS (ENGINEERS, ARCHITECTS, LANDSCAPE ARCHITECTS, LAND SURVEYORS OR THEIR FIRMS), USE 7.1 BEL0W:

7.1 Indemnification

SAMPLE

CONSULTANT 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 CONSULTANT's, its associates', employees', subconsultants', 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.

(OR if contract is <u>NOT</u>* with a design professional (engineers, architects, landscape architects, land surveyors or their firms) *USE THIS PARAGRAPH 7.1 INSTEAD:

7.1 <u>Indemnification</u>

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

7.2 **(*For construction management support Agreements only)***
CONSULTANT shall perform part of the work at sites where the DISTRICT's facilities are to be constructed, and which may contain unknown working conditions and contaminated materials. CONSULTANT shall be solely responsible for the health and safety of CONSULTANT's employees. CONSULTANT shall designate in writing to DISTRICT the field employee who is responsible for the health and safety of its employees. The responsible employee shall have experience and knowledge of all Federal, State and local health and safety regulation requirements. All CONSULTANT personnel on construction sites shall have received all OSHA required health and safety training.

7.3 **(*For construction management support Agreements only)***
In the event that any hazardous materials are encountered during the services provided by CONSULTANT or the work undertaken by construction contractors, DISTRICT shall sign any and all manifests relating to the generation, treatment, disposal or storage of all wastes associated with the work. Additionally, nothing contained in this Agreement shall be construed or interpreted as requiring CONSULTANT to assume the status of a generator, storer, treater, transporter, or disposal facility as those terms appear within the Resource Conservation and Recovery Act, 42 USCA, Section 6901, et seq. (RCRA), or within any state statute of similar effect governing the generation, storage, treatment, transportation, or disposal of wastes.

SAMPLE

7.4 **(*For construction management support Agreements only - include only if design consultant and CM consultant are not the same)***
It is agreed and understood by CONSULTANT and DISTRICT that the design services have been completed by ***(design consultant's name)*** and therefore, CONSULTANT did not undertake any design activity or have design responsibility of the facilities to be constructed prior to execution of this Agreement.

7.5 Insurance Requirements

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

ARTICLE 8 - NOTICES

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

(consulting firm's name)
(address)
Attention: ***(contact, usually the consultant's project manager)***,

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

Any notice which CONSULTANT 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 or Engineering and Construction 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 CONSULTANT.

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 CONSULTANT 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.

SAMPLE

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 CONSULTANT 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 The 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. The 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 contract, 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. CONSULTANT shall not establish or permit any such practice(s) of discrimination with reference to the contract or any part. CONSULTANTS determined to be in violation of this section shall be deemed to be in material breach of this Agreement.

Consultant 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.

CONSULTANT shall include the nondiscrimination provisions above in all subcontracts.

SAMPLE

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

(If this Agreement is to be executed using digital signatures via DocuSign instead of wet signatures, use the following paragraph. Otherwise, delete it.)

9.9 Digital Signatures. The Parties agree that this Agreement may be executed using digital signatures.

(If this Agreement is to be executed by having each party wet sign a separate signature page and submitting all signed pages in original format or via scanning for compilation with the final Agreement, use the following paragraph. Otherwise, delete it.)

9.10 Execution in Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed to be an original but all of which taken together shall constitute one and the same Agreement.

ARTICLE 10 - TERM

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

SAMPLE

(NOTE: do not have a page break leaving signatures by themselves—must have at least the "in witness whereof" paragraph on signature page)

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

EAST BAY MUNICIPAL UTILITY DISTRICT

By: _____ Date _____

(Name),
(Insert title - Director of Engineering and Construction or Manager of Support Services)

Approved As To Form

By:_____
for the Office of the General Counsel

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

By:_____ Date _____

(Name),
(Title)

Rev. 6/2/2021

SAMPLE

EXHIBIT A

East Bay Municipal Utility District
(Project Title)

SCOPE OF SERVICES

I. CONSULTANT SERVICES

CONSULTANT 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

East Bay Municipal Utility District
(Project Title)

COMPENSATION

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 CONSULTANT only the actual costs incurred, subject to the Maximum Cost Ceiling. CONSULTANT certifies that the cost and pricing information used herein are complete, current and accurate. CONSULTANT 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 CONSULTANT services authorized shall be on a cost reimbursement basis and include Direct Labor, Indirect Costs, Subconsultant 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 CONSULTANT an overhead expense equal to ***(insert overhead rate)*** percent of labor costs incurred by CONSULTANT. CONSULTANT 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 CONSULTANT's office and DISTRICT offices or work locations within DISTRICT service area. For work outside of the DISTRICT's services 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 CONSULTANT in the DISTRICT Administration Building, located at 375 11th Street, Oakland, California. CONSULTANT shall be responsible for parking elsewhere).

SAMPLE

- 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 Subconsultant Services

Subconsultant 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 CONSULTANT is required to travel outside of the 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.

SAMPLE

- 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.

2.6 Budget Amounts

Contracted Services	Optional Services	Maximum Cost Ceiling*
$***(dollars)***	$***(dollars)***	$***(dollars)***

**** (Maximum Cost Ceiling is the sum of Contracted and Optional Services. If your scope has no Optional Services, delete the Contracted and Optional Services columns.)***

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

2.7 Billing and Payment

CONSULTANT shall invoice DISTRICT monthly for the actual costs incurred for work performed during the previous month. Actual costs shall include Direct Labor, Indirect Costs, Subconsultant Services, and Other Direct Costs as specified herein. Actual costs shall be invoiced by task as described in Exhibit A. 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 (.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 subconsultant(s) and outside service(s) shall be attached. ***(Insert the following sentence if paragraph 2.9 below applies and is included in agreement. "Where CONSULTANT 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 CONSULTANT within thirty (30) days, upon receipt of a proper CONSULTANT invoice, ***(Optional insert - include the following words here only if retention will***

SAMPLE

be accumulated: "the amount invoiced less a ten percent (10%) retention amount,"), 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. ***(Optional insert - include the following sentence here only if retention will be accumulated: "The retention accumulated to date shall be paid by DISTRICT upon DISTRICT's acceptance of the final version of all documents specified in ARTICLE 1 - SCOPE OF WORK, paragraph 1.6.")***

The Maximum Cost Ceiling is in effect for the entire Scope of Services. If the authorized Maximum Cost Ceiling is reached, CONSULTANT 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 the 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.

2.8 Budget Status Reports

For the duration of this Agreement, the CONSULTANT shall provide DISTRICT with ***("bi-weekly" or "monthly" depending on duration of project)*** 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 CONSULTANT and subconsultant time sheets up to a date within 3 weeks of the date of the budget status report.

2.9 Prevailing Wages and Other Requirements for Construction Inspection, and Construction Related Work During Design and Preconstruction Phases of Construction. ***(Optional Insert – include this paragraph 2.9 and all its subparagraphs if your Scope of Services includes construction, alteration, demolition, installation, maintenance, repair work, or other construction related work during the design or preconstruction phases of construction including but not limited to inspection and land surveying.)***

2.9.1 All Contractors and Subcontractors of any tier bidding on, or offering to performing 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).

SAMPLE

2.9.2 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).

2.9.3 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.

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

2.9.5 Pursuant to Section 1774 of the Labor Code, the Contractor and any of its Subcontractors shall not pay less than the specified prevailing rate of wages to all workers employed in the execution of the contract.

2.9.6 The Contractor shall, as a penalty to the State or the District, forfeit not more than the maximum set forth in Section 1775 of the Labor Code for each calendar day, or portion thereof, for each worker paid less than the prevailing rates for the work or craft in which the worker is employed under the contract by the Contractor or by any Subcontractor under him. The difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which such worker was paid less than the stipulated prevailing wage rate shall be paid to such worker by the Contractor.

2.9.7 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 Contract Sum will be made for the Contractor's payment of these predetermined wage modifications.

2.9.8 The Contractor and each Subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the Work. The payroll records shall be certified and shall be available for inspection in

SAMPLE

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

2.9.9 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.

2.9.10 In the event of noncompliance with the requirements of Section 1776 of the Labor Code, the Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects such Contractor must comply with said Section. Should noncompliance still be evident after such 10-day period, the Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1776 of the Labor Code for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payments then due.

2.9.11 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 the Contractor in excess of eight hours per day, and forty hours during any one calendar week, shall be permitted upon compensation for all hours worked in excess of eight hours per day at not less than one and one half times the basic rate of pay.

2.9.12 The Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1813 of the Labor Code for each worker employed by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any calendar day and forty hours in any one calendar week in violation of the provisions of Labor Code, Sections 1810, et seq.

2.9.13 The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by him in connection with the Work; the record shall be kept open at all reasonable hours to the

SAMPLE

inspection of the District and to the Division of Labor Standards Enforcement of the State of California.

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

2.9.15 The Contractor and every Subcontractor shall post at the workplace and comply with all required wage related workplace postings. Copies of the required postings may be downloaded or ordered electronically from the Department of Industrial Relations website at http://www.dir.ca.gov/wpnodb.html.

SAMPLE

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

EXHIBIT B-1

East Bay Municipal Utility District
(Project Title)

COST DISTRIBUTION

	Consultant						**Subconsultants****						
	Direct Labor						**Subconsultant # 1**			**Subconsultant # 2**			
	Project Manager	Project Engineer	Drafting				Project Engineer	Assist. Engineer		Project Engineer	Assist. Engineer		
Hourly Rate ($/hr.)	(***)	(***)	(***)	Total	Indirect Costs	ODCs*	(***)	(***)	Total Cost	(***)	(***)	Total Cost	Total
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													

SAMPLE

* ODCs = Other Direct Costs.
** Includes any prime consultant markup in subconsultant hourly rates.
*** ***Insert hourly rate.***

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

EXHIBIT B-2

East Bay Municipal Utility District
(Project Title)

LABOR DISTRIBUTION*

	Consultant				**Subconsultants*** **						
					Subconsultant # 1			**Subconsultant # 2**			
	Project Manager	Project Engineer	Drafting	Subtotal	Project Engineer	Assist. Engineer	Subtotal	Project Engineer	Assist. Engineer	Subtotal	Total
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 consultant and subconsultant hours. Also, include the percent time commitment for key personnel if a critical issue for success of the project.)

SAMPLE

EXHIBIT C

East Bay Municipal Utility District
(Project Title)

CEP COMPLIANCE

FIRMS UTILIZED	MINIMUM AMOUNT*	MINIMUM PERCENT**
(Name of Subconsultant's firm)	$***(dollars)***	***(1 to 99)***
(Name of Subconsultant's firm)	$***(dollars)***	***(1 to 99)***
TOTAL	$***(dollars)***	***(1 to 99)***

* Does not include consultant's markup. ***(Include this footnote only if your contract includes markup on subconsultants.)***

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

SAMPLE

EXHIBIT D
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, CONSULTANT shall, at its sole cost and expense, maintain insurance in conformance with the requirements set forth below.

B. CONSULTANT shall provide Verification of Insurance as required by this Agreement by providing the completed Verification of Insurance as requested below signing and submitting this Exhibit C to the DISTRICT. The Exhibit C may be signed by an officer of the CONSULTANT (Agent), by the Insurance Broker for the CONSULTANT or by CONSULTANT's Risk Manager. CONSULTANT shall update Exhibit C throughout the specified term of the insurance required by this Agreement by resubmitting the completed Exhibit C prior to the expiration date of any of the required insurance. The updated Exhibit C shall become a part of the Agreement but shall not require a change order to the Agreement. The Notice to Proceed shall not be issued, and CONSULTANT shall not commence Services until such insurance has been accepted by the DISTRICT.

C. CONSULTANT shall carry and maintain the minimum insurance requirements as defined in this Agreement. CONSULTANT shall require any Subcontractor to carry and maintain the minimum insurance required in this Agreement to the extent they apply to the scope of the services to be performed by Subcontractor.

D. Acceptance of Verification of Insurance by the DISTRICT shall not relieve CONSULTANT of any of the insurance requirements, nor decrease liability of CONSULTANT.

E. 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.

F. Any deductibles, self-insurance, or self-insured retentions (SIRs) applicable to the required insurance coverage must be declared to and accepted by the DISTRICT.

G. At the option and request of the DISTRICT, CONSULTANT shall provide documentation of its financial ability to pay the deductible, self-insurance, or SIR.

H. CONSULTANT is responsible for the payment of any deductibles or SIRs pertaining to the policies required under this Agreement. In the event CONSULTANT is unable to pay the required SIR, CONSULTANT 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).

I. 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.

SAMPLE

J. CONSULTANT 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.

K. 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 and must be before the date of this Agreement, and before the beginning of any Services related to this Agreement.

L. Insurance must be maintained and updated Verification of Insurance be provided to the DISTRICT before the expiration of insurance by having CONSULTANT's insurance broker or agent update, sign and return Exhibit C to the DISTRICT's contract manager. For all claims-made policies the updated Verification of Insurance must be provided to the DISTRICT for at least three (3) years after expiration of this Agreement.

M. If claims-made 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 this Agreement or the start of any Services related to this Agreement, CONSULTANT must purchase an extended reporting period for a minimum of three (3) years after expiration of the Agreement.

N. In the event of a claim or suit, and upon request by the DISTRICT, CONSULTANT agrees to provide a copy of the pertinent policy(ies) within 10 days of such request to the DISTRICT for review. Notwithstanding the foregoing, the DISTRICT may, at any time during CONSULTANT'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 CONSULTANT hereunder, whether or not a suit or claim has been filed. Premium details may be redacted from any such documents requested.

O. 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.

P. 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.

Q. CONSULTANT agrees to provide immediate Notice to the DISTRICT of any loss or claim against CONSULTANT arising out of, pertaining to, or in any way relating to this Agreement, or 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 or claims if they are likely to involve the DISTRICT.

R. It is the obligation of the CONSULTANT to ensure all Contractors/Subcontractors it hires to perform services under this Agreement maintain the necessary coverages and limits, as well as indemnity provisions indemnifying the DISTRICT, based on the nature and scope of services being performed by each Contractor/Subcontractor. CONSULTANT 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 CONSULTANT under this Agreement. Failure or inability to secure fully adequate insurance shall in no way relieve the CONSULTANT or Subcontractor of the responsibility for its own acts or the acts of any

SAMPLE

Subcontractors or any employees or agents of either. All Subcontractors are to waive subrogation against the DISTRICT on all policies. CONSULTANT 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.

S. It is CONSULTANT'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.

T. 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 CONSULTANT, should CONSULTANT 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 CONSULTANT's insurance broker or agent update, sign and return this Exhibit C.

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 CONSULTANT, Subcontractor, and/or 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 CONSULTANT is exempt from carrying Workers' Compensation Insurance, CONSULTANT must return the completed Verification of Insurance confirming that CONSULTANT has no employees and is exempt from the State of California Workers' Compensation requirements.

D. If CONSULTANT is self-insured with respect to Workers' Compensation coverage, CONSULTANT 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."

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E. Waiver of Subrogation. Workers' Compensation policies, including any applicable excess and umbrella insurance, must contain a waiver of subrogation endorsement providing that CONSULTANT 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. CONSULTANT 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 CONSULTANT'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 CONSULTANT is exempt from the State of California's requirement to carry Workers' Compensation insurance.**

As the CONSULTANT's insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

SAMPLE

III. Commercial General Liability Insurance ("CGL") Coverage

A. CONSULTANT'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 CONSULTANT.

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 CONSULTANT and/or 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 Subcontractor on CONSULTANT's behalf.

H. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONSULTANT 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 CONSULTANT 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. CONSULTANT 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 CONSULTANT'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 CONSULTANT, 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 CONSULTANT'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).

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Verification of Commercial General Liability (CGL) Insurance Coverage

As the CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

SAMPLE

IV. Business Auto Liability Insurance Coverage

A. CONSULTANT'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 CONSULTANT.

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 CONSULTANT 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 CONSULTANT'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 CONSULTANT's and/or 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 CONSULTANT'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 CONSULTANT'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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

SAMPLE

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 CONSULTANT.

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, CONSULTANT must purchase an extended period of coverage 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.

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Verification of Professional Liability (Errors and Omissions) Insurance Coverage

As the CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

Insurance Broker/ Risk Manager or Agent'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. CONSULTANT'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 CONSULTANT.

D. Minimum Requirements: It is expressly understood by the parties that CONSULTANT'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 Subcontractor on CONSULTANT's behalf

4. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONSULTANT 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 CONSULTANT, 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 CONSULTANT's insurance shall apply separately to each insured against whom a claim is

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made or suit is brought, except with respect to the policy's limits.

8. CONSULTANT 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 CONSULTANT 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 CONSULTANT'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONSULTANT 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/ Risk Manager or Agent - Print Name: _____

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

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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 SERVICES

for

SD-457 MWWTP Administration and Laboratory Building Seismic and HVAC Systems Improvement

EAST BAY MUNICIPAL UTILITY DISTRICT
MWWTP ADMINISTRATION AND LABORATORY BUILDING SEISMIC AND HVAC SYSTEMS IMPROVEMENT

SCOPE OF SERVICES

OVERVIEW

The Administrative Building (AB) and Laboratory (Lab) are located at the East Bay Municipal Utility District's (District's) Main Wastewater Treatment Plant (MWWTP) in Oakland, California. The AB and Lab were built at different times and support different activities; however, they are part of one connected building. The AB is the southern portion of the AB/Lab building and houses offices, meeting rooms, copy rooms, a lounge, restrooms, and an electrical room. The Lab is the northern portion of the AB/Lab building and includes offices, locker/restrooms, cold rooms, gas cylinder storage room, hazardous materials handling, aquatic toxicology, microbiology, inorganic chemicals lab, bioassay lab, and other water/wastewater laboratory facilities.

The Lab building serves both the District's Water and Wastewater Departments and must operate continually. This project requires close coordination between the Consultant's project team and the District to identify and plan for the construction constraints during the design phase. This project consists of the following components:

1. Seismic evaluation and retrofit design; and
2. HVAC, fire alarm, and fire protection systems improvement design.

The intention of combining the two components into one project is to streamline design activities and design of the construction phasing, staging and sequencing to minimize interruptions to the building occupants and lab operations during construction.

PREVIOUS PROJECTS AND OBJECTIVE

The District completed the following projects related to this project:

- MWWTP Seismic Evaluation Update Project (2019)
- MWWTP Geotechnical Investigation for Seismic Hazard Mitigation Project (2020)
- MWWTP Seismic Structural Evaluation and Conceptual Design Project (2021)
- MWWTP Admin, Lab, and Dewatering Building HVAC Improvements (2021)

Prior evaluations/reports identified the seismic, HVAC, and fire protection systems deficiencies and recommended improvements. The goal of the seismic retrofit component of the project is to provide life safety and mitigate operation impacts during and after a major earthquake. The goal of the HVAC and fire protection systems improvement component is to improve air quality, modernize temperature control systems, and upgrade fire protection systems inside the AB and Lab.

I. CONSULTANT SERVICES

The Consultant shall complete Tasks 1 through Task 8 as described below. Task 9 covers optional services.

Task 1: Project Management

The Consultant shall coordinate engineering evaluation 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 monthly. 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 designate one (1) person to be the main contact for the District's project manager. This person shall be referred to as the "project manager." The project manager will be responsible for coordinating the Consultant's project team and activities. The project manager cannot be changed without prior written approval by the District's project manager.

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 two (2) hard copies, one electronic copy (in PDF format), and 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, and one PDF copy of each final document. The Consultant shall also include an electronic version of 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, Fire Protection, or Mechanical registered in the State of California.

Task 1.1: Meetings

The Consultant shall prepare agenda, prepare presentation slides, coordinate review by District of presentation slides, conduct meetings, 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 the scope, review previous relevant work conducted by the District and Consultant, identify outstanding issues, identify potential risks and mitigations, discuss the project schedule, and discuss coordination protocol between the Consultant and the District.

- 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.

- 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.

- Preliminary Design Workshop: The purpose of this meeting is to present the basis for design, design criteria, general approach, and layout of improvements, and discuss and solicit input on preliminary design issues.

- 50 Percent Design Submittal
  - User Group Meeting ('User Groups' typically include District operations and maintenance staff. Typically, one to two weeks after each design submittal.)
  - Management Briefing (Typically one to two weeks after user group meetings.)

- 100 Percent Design Submittal Meeting
  - User Group Meeting
  - Management Briefing

- Final Design Submittal Management Briefing
  - Management Briefing

- Team Meetings: Meeting agendas and notes will be maintained. 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 the completion of construction.

Deliverable: For all meetings, the Consultant shall prepare an agenda and presentation slides before the meeting; and meeting minutes, decisions, action items, and risks log following the meeting. All documents shall be provided in their source file format and PDF format.

Task 1.2: Project Monthly Invoicing and Reporting

This task includes management and coordination of the project with the District and all 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.

Deliverable: The Consultant shall submit monthly invoices throughout the project and shall provide timely responses to any questions from District regarding content.

Task 2: Quality Assurance and Quality Control

The Consultant shall be responsible for coordination among the project team, subconsultants, and the District to ensure the high quality of the deliverables according to District standards.

Task 2.1: Quality Assurance/Quality Control (QA/QC) Plan (QAQCP)

Within the first 30 calendar days following the notice to proceed, the Consultant shall provide the District with a QAQCP. The Consultant shall designate a QA/QC person to develop and administer the QAQCP. The QAQCP Administrator shall work with the Consultant's project manager to assemble the QA/QC team, each responsible for reviewing an element or discipline within the design (e.g., architectural, structural, electrical, mechanical, Civil, instrumentation, fire protection, etc.).

The District expects that all deliverables and submittals will be thoroughly reviewed by the Consultant's QA/QC team in accordance with the QAQCP prior to submitting to the District. At a minimum, the QAQCP shall:

- Identify the QA/QC team members, including all subconsultants to be used.
- Describe the roles, responsibilities, and budget (level of effort) for each team member.
- Provide a QA/QC schedule identifying QA/QC milestones.
- Describe each deliverable requiring QA/QC, including technical memoranda, material take-off estimates, cost estimates, equipment sizing and design data, plans and specifications, and all associated calculations.
- Provide a constructability review during design development.
- Ensure that all project team members, including all subconsultants, are working in the latest design model space and that plan reviews ensure that coordination among the project team has resulted in a cohesive design package.

The Consultant shall manage all internal QA/QC reviews. The Consultant shall also participate in and report on the coordination with Independent Peer Review (IPR) efforts delineated under Task 2.2.

Deliverable: The Consultant shall submit QAQCP for the District's review, update QAQCP as required, follow up correspondences between the QA/QC team and the District project manager, prepare responses to the District's written review comments, and provide constructability review comments and responses during design development.

Task 2.2: Independent Peer Review (IPR) For Seismic Evaluation and Retrofit Design

IPR is only required for the seismic design component of the scope; IPR efforts shall be performed in accordance with the industry peer review standards of care and guidelines. IPR shall not be performed by the same firm performing the seismic design. The Consultant's subconsultant assigned to perform the IPR is referred to herein as the Peer Reviewer. The subconsultant's qualifications shall be approved by the District before assignment as the Peer Reviewer. Peer Reviewer shall be specialized in seismic evaluation and retrofit of existing buildings with a minimum of ten (10) years of direct experience.

Peer Reviewer shall perform their reviews independently from the Consultant's design and QA/QC efforts. Peer Reviewer shall coordinate all IPR efforts, findings, resolutions, and deliverables directly with the District's Project Manager. Peer Reviewer shall participate in coordination meetings with the District and Consultant as needed to discuss and resolve IPR findings. Peer Reviewer shall also attend the following project meetings:

- Kick-off
- Preliminary Design Workshop
- 50 Percent User Group Meeting
- 100 Percent User Group Meeting

Peer Reviewer shall provide an independent review of the seismic-related Consultant's work delineated under Task 4 through Task 5. The IPR aim is to validate that the design achieves the desired seismic performance objectives. This shall include, but not be limited to:

- Ensuring that the appropriate codes and guidelines are applied

- Validating of design assumptions and approach to design
- Considering alternative design options
- Confirming selection of materials and constructability

Deliverable: The Peer Reviewer shall document findings and issues in a peer review log following each seismic-related deliverable under Tasks 4 through Task 5. The peer review log shall be submitted within two weeks of each task deliverable by the Consultant and shall include a rolling peer review log of findings, issues, and resolutions. Upon incorporation of 100 percent comments and resolution of IPR findings, the Peer Reviewer shall produce an IPR Technical Memorandum noting the review process and documenting findings and outcomes. The final rolling peer review log shall be attached.

Task 3: Data Collection and Condition Assessments

The Consultant shall collect and review facility records for use in the evaluations and design. The Consultant shall also perform condition assessments to confirm the condition and configuration of existing structural and nonstructural elements, and existing HVAC, control, and fire protection systems. Condition assessment will be limited to visual assessment of accessible areas. The Consultant shall perform this work under the following tasks and include findings in the Preliminary Design Report that will serve as the basis of design for the project.

Task 3.1: 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)
- Previous HVAC systems evaluations and reports
- Condition Assessment Data and Surveys (HVAC systems)

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 site visits to become familiar with the project site. 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 3.2: Structural and Nonstructural Condition Assessment and Investigations

The Consultant shall review available existing survey information, perform site investigations as needed, and document existing conditions to support evaluation, retrofit, and mitigation design efforts. The District will be present and coordinate access to the facilities.

For nonstructural elements, the Consultant shall further develop inventories, assess initial vulnerability based on seismic performance objectives, and develop preliminary concepts for seismic mitigation. The District and Consultant shall both contribute to the development of risk assessment ratings to support the prioritization of nonstructural elements.

No material or anchorage testing is anticipated. However, if the Consultant determines that certain testing is warranted, the Consultant shall submit to the District a proposal for testing services with costs and justification for consideration.

Deliverable: The Consultant shall summarize findings in a Condition Assessment and Investigation TM. Appendices shall include structural and nonstructural component tables. Inventory tables shall also be provided in Microsoft Excel format.

Task 3.3: HVAC, Control, and Fire Protection Systems Condition Assessment and Investigations

The Consultant shall review available existing reports, perform site investigations as needed, and document the conditions to support design efforts. The District will be present and coordinate access to the facilities.

No testing is anticipated. However, if the Consultant determines that certain testing is warranted, the Consultant shall submit to the District a proposal for testing services with costs and justification for consideration.

Deliverable: The Consultant shall summarize findings in a Condition Assessment and Investigation TM.

Task 4: Preliminary Design

The Consultant shall perform preliminary design to: define the design criteria, identify seismic vulnerabilities, identify HVAC system and fire protection system deficiencies, develop alternatives; and prepare preliminary improvement layouts, sections, cost estimates, construction phasing and staging, list of drawings, list of specifications, and other details needed to proceed to final design; and identify project constraints such as permitting, staging, procurement of materials, constructability, etc. The District will provide past related reports, existing background drawings, and District standard design guidelines, and assist in providing technical information for the concept of the design to the Consultant. The Consultant shall be responsible for the preliminary design.

The Consultant's scope of evaluation and design work shall encompass the following:

1. Structural and Nonstructural components
2. HVAC, Control, and Fire Protection systems
3. Design of construction phasing, staging, and sequencing

The work will be conducted under the following tasks and compiled into a Preliminary Design Report that will serve as the Basis of Design for the project.

Task 4.1: Environmental, Health, Safety, and Security Compliance Checklist

The District shall prepare a District-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 the information required for the checklist. Specification requirements, as determined by the District, following completion of the checklist, shall be included in the detailed design. A sample checklist is included in Appendix G.

Deliverable: The Consultant shall include documentation and work products in the Preliminary Design Report drafts and final. See Task 1.1 for meeting-related deliverables.

Task 4.2: Seismic Retrofit Improvements

The Consultant shall work with the District to clearly establish project objectives and design criteria, including specific seismic performance objectives. The Consultant shall incorporate current industry standards, codes, and guidelines, including but not limited to:

- ASCE 41-17, Seismic Evaluation and Retrofit of Existing Buildings
- ASCE 7-16, Minimum Design Loads for Buildings and Other Structures
- CBC (California Building Code) 2019
- FEMA E-74 Reducing the Risks of Nonstructural Earthquake Damage
- EBMUD Wastewater Seismic Evaluation and Retrofit Design Criteria Guidelines
- EBMUD Engineering Standard Practice 550.1, Seismic Design Requirements

The District will provide geotechnical information for the project site from available recent reports and perform any additional geotechnical engineering necessary to support the preliminary and final design. The Consultant shall direct any geotechnical inquiries and needs to the District.

The Consultant shall identify seismic vulnerabilities, perform preliminary evaluations and designs, and develop alternatives, sections, plans, and renderings as necessary to cover required structural and non-structural seismic improvements. The District will provide any available past conceptual design information, but the Consultant shall perform all evaluations and analyses required to support the Consultant's preliminary and final designs.

Seismic assessment of nonstructural elements shall consider FEMA E-74 guidelines. The Consultant and District will work together to categorize and prioritize the nonstructural elements. The approach to addressing deficiencies will include some retrofit scope in construction bid documents. Other less critical nonstructural components can be categorized in terms of general similarity and covered by standard details with sufficient specifications for future implementation.

Deliverable: The Consultant shall summarize findings in a Seismic Retrofit Improvement TM and shall include documentation and work products in the Preliminary Design Report drafts and final. For any nonstructural standard details for future implementation, the Consultant shall compile a summary, descriptions, and details in a Seismic Retrofit - Nonstructural Standard Details TM.

Task 4.3: Structural and Nonstructural Modifications

The Consultant shall develop sections, plans, and renderings as necessary to show changes stemming from access needs, condition assessments, or seismic improvements impacts. These changes do not include the seismic improvements included under Tasks 4.2. The Consultant shall evaluate alternatives and make recommendations for inclusion. Such changes may include, but are not limited to, the following:

- Building layout change (e.g., new office space inside existing building)
- Access modifications
- Equipment relocation or replacement
- Architectural modification due to changes to the building envelop, etc.

Deliverable: The Consultant shall summarize findings in a Structural and Nonstructural Modifications TM and shall include documentation and work products in the Preliminary Design Report drafts and final.

Task 4.4 HVAC, Control, Fire Protection Systems Improvement

The Consultant shall identify the HVAC system and fire protection system deficiencies, perform preliminary evaluations, and design and develop alternatives. Alternatives may include the replacement of equipment, rehabilitation of equipment, or a combination of the two to improve the system. The District will provide any available past evaluation and preliminary design reports, but the Consultant shall perform all evaluations and analyses required to support the Consultant's preliminary and final designs.

Deliverable: The Consultant shall summarize findings in an HVAC and Fire Protection Systems Improvement TM and shall include documentation and work products in the Preliminary Design Report drafts and final.

Task 4.5 Design of Construction Phasing, Staging, and Sequencing

The Lab serves both District Water and Wastewater Departments and must continually operate. The Consultant shall compile and develop information and design alternatives being prepared under Tasks 4.2 to Task 4.4, and design of construction phasing, staging, and sequencing to minimize lab operation during construction (i.e., dust, debris, noise, vibration). When lab shutdowns are anticipated, the Consultant, with the District cooperation, shall seek feasible workarounds to maintain lab operations and include them in the report.

Design of construction phasing, staging, and sequencing is a critical component of the preliminary design. It is crucial that disruptions to AB/Lab are determined and planned properly, and included in the detailed design to minimize interruptions during construction.
Deliverable: The Consultant shall summarize findings in a Design of Construction Phasing and Staging TM and shall include documentation and work products in the Preliminary Design Report drafts and final.

Task 4.6 Preliminary Design Workshop

The Consultant shall conduct a workshop to present the evaluation and assessment findings, alternatives, issues, and recommended design, and to solicit input and direction as warranted. Material to be presented should be included in the draft Preliminary Design Report, which will be distributed to participants prior to the workshop. Upon completion, the Consultant shall incorporate comments and decisions into the Preliminary Design Report. The Consultant shall provide alternatives details with predesign level construction cost estimates to allow the District to consider alternatives. The Consultant shall keep a review comments log, documenting all DISTRICT comments, the Consultant's responses to those comments, and changes made to the Preliminary Report due to those comments.

Deliverable: The Consultant shall include documentation and work products in the Preliminary Design Report. See Task 1.1 for meeting-related deliverable.

Task 4.7: Preliminary Design Report

The Preliminary Design Report shall be the basis for detailed design for the subsequent Task 5. The Preliminary Design Report shall address the following: scope of work for final design and description of recommended design project, project objectives, design criteria, assessment findings and seismic vulnerabilities, general arrangement of new and retrofitted elements, including considerations for other required facility modifications, evaluation of alternatives, list of drawings, list of specifications, implementation schedule for construction, list of outside utility/agency permits for District applications, preliminary construction cost estimate, potential project constraints, phasing, staging and relocation requirements, sequencing requirements during construction, and bid package alternatives (e.g., whether there are advantages to multiple bid packages to speed implementation or reduce cost).

Deliverable: The Consultant shall submit the Preliminary Design Report in three versions: first as a pre-draft document for review by the District's Project Manager three (3) weeks prior to the Preliminary Design Workshop; next as an updated draft document for distribution to the District User Group one (1) week prior to the Preliminary Design Workshop; and then as a final document upon the incorporation of changes based on User Group review and input.

All Preliminary Design Report deliverables shall include hard copies, as noted below, and a PDF copy. Half-size drawings, 11x17 paper size, shall be attached.

- Pre-Draft Preliminary Design Report: Two (2) hard copies
- Draft Preliminary Design Report: Eight (8) hard copies
- Final Preliminary Design Report: Eight (8) hard copies

Task 5: Detailed Design

Work on the detailed design shall be as defined and recommended in the final approved Preliminary 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 by the Consultant 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 ETABS, or SAP2000 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 to the District in its source format.

- 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.

- 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 inquire from the District and produce all drawings in either AutoCAD or MicroStation format at each design phase and shall comply with latest EBMUD Wastewater drafting standards and guidelines as discussed and given at Drafting Coordination meetings. 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. At the sole discretion and written approval of the District, use of translation software from AutoCAD to MicroStation may be allowed if approved in the Drafting Coordination Meeting by the District.

- 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 IPR comments
  - Facilitate User Group Meetings, except following the FinalDesignSubmittal
  - Facilitate 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 preliminary and final design. The Consultant shall direct any geotechnical inquiries and needs to the District.

- Architectural Support: The Consultant shall prepare architectural renderings, plans, sections, and details for building modifications as needed to cover architectural changes necessitated by the seismic, HVAC and fire protection improvements.

- Civil, Structural, Architectural, Mechanical, Electrical/Controls, Piping Engineering: The Consultant shall prepare required civil, structural, architectural, mechanical, electrical/controls, and piping plans, sections, details, and related specifications as needed to cover site changes and related work necessitated by the seismic, HVAC and fire protection improvements.

- 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 detailed design work and make submittals under the tasks included below.

Deliverable: For meetings during the detailed design effort, see Task 1.1 for deliverables. For design submittals, the Consultant shall provide the following deliverables listed in Table 2.

Table 2 – Detailed Design Deliverables

Submittal Deliverable Item	Qty	Include in Design Submittals		
		50%	100%	Final
Hard Copies:				
▪ Drawings Half-size (11x17 size)	8	x	x	x
▪ Specifications	8	x	x	x
▪ Construction Cost Estimate and Schedule	8		x	x
▪ Comment Log hard copy	8	x	x	x
▪ Calculations	1	x	x	x
Electronic Copies:				
▪ Drawings in source file format and half-size (11x17 size) PDF	1	x	x	x
▪ Specifications in MS Word	1		x	x
▪ Construction Cost Estimate & Schedule in PDF	1		x	x
▪ Comment Log in MS Excel	1	x	x	x
▪ Calculations in PDF	1			x
▪ Calculations in source format	1	x	x	x
▪ Computer Models in source format	1	x	x	x
▪ Complete submittal in PDF	1	x	x	x

Task 5.1: 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)
  - Mechanical, electrical, and plumbing relocation plans and details (as applicable)
  - Temporary and permanent utility relocation plans (as applicable)
- Key technical specifications
- Complete specification list
- 50%-level construction cost estimate
- Updated project implementation and construction schedule, including construction phasing, staging, and any special constraints and sequencing requirements
- List of required permit applications and permit requirements

Task 5.2: 100% Detailed Design

The Consultant shall incorporate findings and resolutions from all previous comments into 100% submittal of detailed design drawings, specifications, and cost estimates. Design documents shall be developed to 100 percent design level of completion, and the reminder of work only includes incorporation of District and IPR comments. The 100% detailed 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 construction phasing, staging, and any special constraints and sequencing requirements
- Permit-required documents
- Final engineering calculations

Task 5.3: Final Detail Design

The Consultant shall incorporate the District and IPR comments on the 100% detailed design submittal into the final detailed design drawings, specifications, schedules, cost estimate, construction phasing and staging and engineering calculations. At this level, all the documents shall be ready for public bidding of the construction. Design documents shall be complete, including:

- All final drawings and specifications
- Final construction cost estimate and implementation/construction schedule
- Engineering calculations

Task 5.4: Permit Assistance

The final design for occupied buildings and office spaces will require building permits from the City of Oakland. The District shall prepare all permit applications. The Consultant shall assist the District in providing required design documents, attending the meetings, 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.

Task 6: Evaluation and 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. The District will print and distribute any addenda produced during the bid period. If addenda are issued during the bid period, the Consultant shall prepare conformed contract documents incorporating addenda, prior to issuance of the Contractor's Notice to Proceed.

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.

Deliverable: 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. The Consultant assumes a total labor estimate of 80 hours based on assuming 8 hours per RFI response and a total of 10 RFIs.

- 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 contractor is required to submit per the Contract Documents. The Consultant assumes a total labor estimate of 320 hours based on assuming 16 hours per submittal response and a total of 20 submittals.

- 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. The Consultant assumes a total labor estimate of 80 hours based on assuming 20 hours per change order assistance and a total of 4 change orders.

Deliverable: 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. Consultant assumes 2 hours per construction meeting for an estimate of 50 total construction meetings. Consultant assumes 4 hours per site visit for an estimate of 50 total site visits.

Deliverable: The Consultant shall submit observation notes and photos as appropriate for further review and documentation.

Task 8.3: Special Inspections

- The Consultant shall perform special inspections of the contractor's work in the field for conformance to the bid document, applicable codes and standard, approved submittals and related requirements. The Consultant shall assume making daily site visits once field work requiring specialized inspections begin. Special inspections shall include welding, installation of anchors, and other related work requiring special inspections. The Consultant assumes 10 days of inspections at 4 hours per day.

Deliverable: The Consultant shall submit daily field reports, 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 HVAC and Fire Protection systems.

- 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 HVAC, startup, and commissioning for HVAC and fire protection systems.

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 contractor changes to the drawings.

Deliverable: The Consultant shall submit completed record drawings in 2 hard copies, electronic source files, and PDF format.

Task 9: Optional Services

Optional services, if warranted, will be negotiated at a future date. The District will issue a Notice to Proceed letter to authorize the optional services.

Task 9.1: Optional Services- Design Services

At the discretion of the District, the following design services may be considered, but are not limited to:

- Specialized modeling, evaluation, or design work
- Training District staff on specialized software used in the project
- Development of recommended work
- Additional design and architectural services.

Task 9.2: Optional Services- Engineering Services

At the discretion of the District, the following engineering services may be considered, but are not limited to:

- Specialized field tests and inspections
- Additional engineering services during construction services
- Construction management support services

- End Exhibit E

EXHIBIT F
REFERENCE MATERIALS

HVAC-Related References

Seismic-Related References

SET NO. _____

MWWTP ADMIN, LAB & DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONTRACT DOCUMENTS

VOLUME III - DRAWINGS

FEBRUARY 2020

SPECIFICATION SD-402

CONFORMED DRAWINGS

EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

Recommended Matthew R. Hoeft For

Douglas Y. Higashi
Manager of Wastewater Engineering Division
R.P.E. No. C 45081

Approved Eileen M. White

Eileen M. White
Director of Wastewater
R.P.E. No. C 44607

USER: ldwecker
DATE: 07-JUL-2021 09:41
FILE: J:\SD\SD402_MWWTP HVAC and Bldg Imp\sd402cover.r00

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3	SD402-G-003	0	ADMINISTRATION/LABORATORY BUILDING SITE MAP
	ADMINISTRATION AND LABORATORY BUILDING DRAWINGS		
	ARCHITECTURAL		
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57	W25.00-M-881	0	SCHEDULES
58	W25.00-M-891D	3	DEMOLITION VENTILATION SYSTEM FLOW SCHEMATIC
59	W25.00-M-891	4	VENTILATION SYSTEM FLOW SCHEMATIC
60	W25.00-M-892	0	DETAILS SHEET 1
61	W25.00-M-893	0	DETAILS SHEET 2
62	W25.00-M-894	0	DETAILS SHEET 3
63	W25.00-M-895	0	DETAILS SHEET 4
64	W25.00-M-896	1	DETAILS SHEET 5
65	W25.00-M-897	0	DETAILS SHEET 6
66	W30.00-M-802	3	HVAC FIRST FLOOR PLAN
67	W30.00-M-803D	3	DEMOLITION HVAC SECOND FLOOR PLAN
68	W30.00-M-803	3	HVAC SECOND FLOOR PLAN
69	W30.00-M-804D	5	DEMOLITION HVAC ROOF PLAN
70	W30.00-M-804	5	HVAC ROOF PLAN
71	W30.00-M-081	2	VENTILATION SYSTEM FLOW SCHEMATIC
	ELECTRICAL		
72	W25.00-E-102D	8	DEMOLITION FIRST FLOOR PLAN
73	W25.00-E-102	8	FIRST FLOOR PLAN
74	W25.00-E-103D	9	DEMOLITION SECOND FLOOR PLAN
75	W25.00-E-103	9	SECOND FLOOR PLAN
76	W25.00-E-104	4	ROOF PLAN
77	W25.00-E-122	2	CONDUIT SCHEDULE 2
78	W25.00-E-203D	4	DEMOLITION - 480 VOLT POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - 23C (FRONT)
79	W25.00-E-203	4	480 VOLT POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - 23C (FRONT)
80	W25.00-E-204D	6	DEMOLITION - 480 VOLT POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - DW (FRONT)
81	W25.00-E-204	6	480V POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - DW (FRONT)
82	W25.00-E-205D	7	DEMOLITION - 480 VOLT POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - DW (REAR)
83	W25.00-E-205	7	480 VOLT POWER DISTRIBUTION SINGLE LINE DIAGRAM - MCC - DW (REAR)
84	W25.00-E-221	4	MCC-23C ELEVATION (FRONT)
85	W25.00-E-222	8	MCC - DW ELEVATIONS
86	W25.00-E-230	4	PANEL SCHEDULES
87	W25.00-E-702	4	FIRE ALARM SYSTEM FIRST FLOOR PLAN
88	W30.00-E-104D	4	DEMOLITION ELECTRICAL ROOF PLAN

GENERAL NOTES

1. ITEMS SHOWN IN BLACK ON DRAWINGS INDICATE WORK UNDER THIS CONTRACT, SEE DWG STD-G-003.

2. ITEMS SHOWN IN GRAY/SCREENED REFERENCES TO OTHER DRAWINGS MAY BE FOUND IN THE ORIGINAL CONTRACT DOCUMENTS, SEE DWG STD-G-003.

3. CONTRACTOR SHALL ACKNOWLEDGE THAT NOT ALL EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS, WHICH MAY OR MAY NOT INTERFERE WITH NEW WORK.

4. PROJECT DRAWING NUMBERS ARE DEFINED AS FOLLOWS:
   SDXXX-AAA.BB-C-XXX.D WHERE:

   SDXXX = PROJECT NUMBER (3-DIGIT NUMBER FOLLOWING THE LETTERS 'SD')
   AAA = AREA CODE (3-DIGIT ALPHA/NUMERIC NUMBER FOR FACILITY OR AREA) (OMITTED WHEN NOT APPLICABLE)
   BB = SUBSTRUCTURE NUMBER (NUMBER FOR STRUCTURE WITHIN FACILITY OR AREA) (OMITTED WHEN NOT APPLICABLE)
   C = DISCIPLINE CODE LETTER
   - A - ARCHITECTURAL
   - C - CIVIL
   - E - ELECTRICAL
   - G - GENERAL
   - I - INSTRUMENTATION (P&ID)
   - L - LANDSCAPE
   - M - MECHANICAL
   - S - STRUCTURAL

   XXX = SERIAL NUMBER (MAY INCLUDE A DECIMAL AND/OR LETTER SUFFIX)
   D = ADDITIONAL INFORMATION CODE LETTER
   D - DEMOLITION DRAWING (OMITTED WHEN NOT APPLICABLE)
   X - RELATED DETAIL OR PHASING INFORMATION

5. AREA CODES AND SUBSTRUCTURE NUMBERS ARE DEFINED AS FOLLOWS:
   - SD402 - MULTIPLE PROJECT AREAS
   - W25 - SLUDGE DEWATERING BUILDING
   - W30 - WASTE ACTIVATED SLUDGE THICKENING STATION
   - W42 - LABORATORY

   SEE DRAWING STD-G-004 FOR DETAILS.

6. IF A CALL- OUT REFERENCES A DRAWING WITH THE SAME AREA CODE AND SUBSTRUCTURE NUMBER, THE AREA CODE AND SUBSTRUCTURE NUMBER WILL BE OMITTED. ONLY THE DISCIPLINE CODE AND SERIAL NUMBER WILL BE SHOWN.

7. REFERENCE DRAWINGS ARE INCLUDED TO PROVIDE INFORMATION ABOUT EXISTING CONDITIONS. REFERENCE DRAWING DO NOT CONTAIN INSTRUCTIONS FOR THIS PROJECT. ADDITIONALLY, ONLY SPECIFIC DRAWINGS/DETAILS CALLED OUT BY THE SD402 PROJECT DRAWINGS SHALL BE USED TO EVALUATE EXISTING CONDITIONS; OTHER INFORMATION SHOWN MAY OR MAY NOT BE CURRENT. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY EXISTING INFORMATION AS REQUIRED.

8. SECTIONS AND DETAILS ARE DESIGNATED BY FRACTIONAL SYMBOLS SUCH AS: A/C-001; 3/M-001

   THE NUMERATOR IDENTIFIES THE SECTION OR DETAIL:
   - LETTERS IDENTIFY SECTIONS.
   - NUMERALS IDENTIFY DETAILS.

   THE DENOMINATOR IS THE SHEET REFERENCE NUMBER:
   - IN A PARENT VIEW, IT IDENTIFIES THE SHEET ON WHICH THE SECTION OR DETAIL VIEW IS SHOWN.
   - IN THE CAPTION OF A SECTION OR DETAIL VIEW, IT IDENTIFIES EACH SHEET ON WHICH THE PARENT VIEW IS SHOWN.

9. ENGINEERS STAMPS & SIGNATURES APPLY TO CURRENT PROJECT SD402.

10. SEE DWGS STD-M-001 AND STD-M-002 FOR GENERAL PIPING NOTES.

11. SEE DWG STD-E-001 FOR GENERAL ELECTRICAL NOTES.

STANDARD DRAWINGS

STD-G-001	7	ABBREVIATIONS FO WASTEWATER FACILITIES A THRU G
STD-G-002	5	ABBREVIATIONS FO WASTEWATER FACILITIES H THRU S
STD-G-002.1	0	ABBREVIATIONS FO WASTEWATER FACILITIES T THRU Z AND SYMBOLS
STD-G-003	4	LEGENDS, SECTION, DETAIL, ELEVATION, PHOTO, AND PIPING SYSTEMS DESIGNATIONS
STD-G-004	6	EQUIPMENT TAG AREA CODES FOR MAIN WASTEWATER TREATMENT PLANT
STD-G-005	8	EQUIPMENT TAG SYSTEM COLORS AND SIGNAGE DETAILS
STD-G-006	4	EQUIPMENT TAG TYPE CODES
STD-M-001	5	SYMBOLS DESIGNATIONS AND NOTES
STD-M-002	2	HVAC SYMBOLS AND LEGENDS, ABBREVIATIONS AND NOTES
STD-E-001	8	LEGENDS, ABBREVIATIONS AND NOTES
STD-I-001	4	LEGENDS, SYMBOLS AND ABBREVIATIONS

REFERENCE DRAWINGS

SD185 A2.1	FIRST FLOOR COMPOSITE PLAN
SD185 A4.1	PARTIAL ROOF PLAN AND ROOF NOTES
SD185 A4.2	PARTIAL ROOF PLAN AND ROOF PHASING NOTES
SD185 A4.3	ROOFING DETAILS
SD185 A4.4	PARAPET AND MANSARD ROOF EXPANSION JOINT DETAILS
SD185 A4.5	MANSARD ROOF EXPANSION JOINT DETAILS
SD185 A4.6	MANSARD ROOF AND MISCELLANEOUS DETAILS
SD185 M2.1	FLOOR PLAN/HVAC
SD185 M2.2	FLOOR PLAN/HVAC
SD185 M2.3	FLOOR PLAN/HVAC
SD185 M2.4	FLOOR PLAN/HVAC
SD185 M2.5	FLOOR PLAN/HVAC
SD185 M2.6	FLOOR PLAN/HVAC
SD185 M3.1	ROOF PLAN AND PARTIAL BOILER FLOOR PLAN
SD185 M3.2	ROOF PLAN
SD185 M5.1	FLOW DIAGRAMS
SD319-W36.20-E-101T	BLEND TANK AREA PLAN
SD319-W36.20-E-102T	SUBSTATION U-16 ELECTRICAL BUILDING PLAN AND SECTIONS
SD319-E-201T	SUBSTATION U-16 SINGLE LINE DIAGRAM
W36.23-E-222T	SWGR U-16 ELEVATION

GENERAL CIVIL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE, AND AMENDMENTS AND ORDINANCES REQUIRED BY LOCAL JURISDICTIONS WHERE APPLICABLE.

2. A CONFORMED SET OF CONTRACT DOCUMENTS SHALL BE MAINTAINED ON THE JOB SITE AT ALL TIMES WHILE WORK IS IN PROGRESS. DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL NOT BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER IN WRITING.

3. PROVIDE PORTABLE TOILETS AT EACH CONSTRUCTION SITE.

4. CONTRACTOR SHALL NOT CONDUCT STAGING OPERATIONS OUTSIDE OF THE SPECIFIED LIMITS WITHOUT OBTAINING PROPER PERMITS FROM THE LOCAL JURISDICTIONS.

5. CONTRACTOR SHALL CONDUCT A PRE- CONSTRUCTION SURVEY USING DIGITAL PHOTOS OR VIDEOS TO DOCUMENT EXISTING CONDITIONS OF ROADS AND SITE FEATURES.

6. ANY GATES, SIGNS, UTILITY MARKERS, OR OTHER SURFACE FEATURES, INCLUDING BUT NOT LIMITED TO ROADWAYS, CURBS, DIKES, GUTTERS, ETC. DAMAGED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO THEIR PRE- CONSTRUCTION CONDITION.

7. THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN ADEQUATE DRAINAGE PATTERNS AT THE SITE. WATER SHALL NOT BE ALLOWED TO POND OR STAND DUE TO CONTRACTOR'S ACTIVITIES. SEE SPEC 01 35 44 & 31 23 19.

8. ALL EXISTING PIPING AND ELECTRICAL CONDUITS SHALL BE SUPPORTED AND PROTECTED IN PLACE DURING TRENCHING OR EXCAVATION WORK BY THE CONTRACTOR. THE CONTRACTOR SHALL NOT DISTURB THE LOCATIONS, ALIGNMENTS AND ELEVATIONS OF THE EXISTING PIPING AND CONCRETE ENCASED ELECTRICAL CONDUITS, UNLESS OTHERWISE APPROVED BY ENGINEER.

9. VERIFY DEPTH, SIZE, MATERIAL AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER OF CONFLICTS PRIOR TO CONSTRUCTION.

10. CONTACT UNDERGROUND SERVICE ALERT (USA) BEFORE ANY PLANNED EXCAVATION. DO NOT START THE EXCAVATION UNTIL ALL KNOWN MEMBER UTILITIES HAVE RESPOND.

11. HAND DIG WHEN WITHIN 4 FEET OF KNOWN, EXISTING, AND ACTIVE UTILITIES.

12. ABANDONED LINES SHALL BE CUT AND CAPPED UNLESS NOTED OTHERWISE. ALL APPURTENANCES OF ABANDONED LINES WITHIN THE PROJECT EXCAVATION LIMITS SHALL BE REMOVED. CONTRACTOR SHALL AS-BUILT ALL ABANDONED LINES.

13. DO NOT PLACE BACKFILL UNTIL UTILITY LINES ARE INSPECTED AND APPROVED BY THE ENGINEER. ALL TRENCH BACKFILL SHALL BE HALF SACK CLSM UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

14. MANHOLE SUBJECT TO GROUNDWATER INFILTRATION, REFER TO SECTION 31 23 19 FOR DEWATERING.

15. REPAIR JOINTS BETWEEN CULVERT AND ON SITE AND OFF SITE MANHOLES PER SPEC SECTION 03 01 30.62, CONCRETE REPAIR.

16. MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN SERVICE ON ACCESS ROAD AT ALL TIMES.

17. HAND EXCAVATE AROUND EXISTING UTILITIES AND BACKFILL WITH CLSM. SUPPORT AS REQUIRED FOR CONSTRUCTION. SHORING PER SPEC SECTION 01 35 24, PROJECT SAFETY REQUIREMENTS.

18. FOR ALL WALL PENETRATION, CONTRACTORS SHALL SCAN FOR REBARS ON BOTH SIDES OF WALL AND SUBMIT RESULTS TO ENGINEER FOR DETERMINING EXACT LOCATION OF OPENING. NO MORE THAN ONE REBARS TO BE CUT IN EACH DIRECTION EACH FACE. DISTRICT WILL SPECIFY WHICH REBARS TO CUT AFTER SCANS. AFTER RECEIVING APPROVAL OF FINAL LOCATION, CORE DRILL HOLE THROUGH WALL FOR PIPE AND GROUT ANNULAR SPACE AROUND PIPE.

GENERAL STRUCTURAL NOTES:

1. THESE NOTES AND TYPICAL DETAILS APPLY TO ALL STRUCTURAL DRAWINGS.
2. CONTRACTOR SHALL VERIFY IN THE FIELD THE LAYOUT, DETAILS, DIMENSIONS AND ELEVATIONS BEFORE PROCEEDING WITH WORK. REPORT ANY DISCREPANCIES TO ENGINEER FOR NECESSARY ADJUSTMENTS.
3. SEE CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT, PIPING, CONDUITS AND OTHER PERTINENT INFORMATION.
4. CODE : 2019 CALIFORNIA BUILDING CODE (CBC)

CONCRETE

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.
2. CEMENT SHALL BE PORTLAND CEMENT ASTM C150 TYPE II OR TYPE V, CONTAINING LESS THAN 0.6 % ALKALIES.
3. MAXIMUM WATER-CEMENT RATIO SHALL BE 0.45.
4. ALL EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE A 3/4" CHAMFER.
5. CONSTRUCTION JOINTS SHALL BE ROUGHENED BY SAND BLASTING OR MECHANICAL MEANS (BUSH HAMMER, SCABBLER OR EQUAL) TO 1/4" AMPLITUDE.

REINFORCEMENT

1. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.
2. EXTEND ALL REINFORCING BARS TO FAR FACE OF CONCRETE AT A 90-DEGREE STANDARD HOOK.
3. REINFORCING BARS SHALL BE PROVIDED WITH A MINIMUM CLEARANCE OF 2 INCHES FROM PIPE, FLANGES, OR METAL PARTS EMBEDDED IN CONCRETE, UON.
4. REINFORCING BARS SHALL HAVE CONCRETE COVER AS FOLLOWS, UON:
   - A. CONCRETE CAST AGAINST EARTH 3"
   - B. ALL OTHER CONDITIONS 2"
5. STAGGER LAP SPLICES. SPLICE NO MORE THAN 50% OF EACH LAYER OF BARS AT ANY SINGLE LOCATION.

STEEL

1. BOLLARDS AND ASSOCIATED ITEMS SHALL BE STAINLESS STEEL 304L.
2. ALL STRUCTURAL AND MISCELLANEOUS CARBON STEEL SHALL CONFORM TO THE FOLLOWING, UON:
   - A. SHAPE, PLATE AND BAR — ASTM A36
   - B. PIPE — ASTM A53, GRADE B, OR A501
   - C. HOLLOW STRUCTURAL SECTIONS — ASTM A500 GRADE B, OR A501
3. ALL STRUCTURAL AND MISCELLANEOUS CARBON STEEL, INCLUDING RAILING AND POSTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, UON.
4. STAINLESS STEEL SHALL BE TYPE 304 (304L FOR WELDED ITEMS), UON.
5. DO NOT FABRICATE UNTIL ALL DIMENSIONS INCLUDING ANCHOR HOLE LOCATIONS ARE FIELD VERIFIED.

CONNECTIONS

1. ANCHOR BOLTS, AND BOLTS, WASHERS AND NUTS FOR STEEL MEMBER CONNECTIONS SHALL BE STAINLESS STEEL CONFORMING TO ASTM F593 AND F594, UON. STAINLESS STEEL BOLTS SHALL HAVE A MINIMUM YIELD STRENGTH (Fy) OF 45 ksi AND TENSILE STRENGTH (Fu) OF 85 ksi.
2. DETERMINE LOCATION OF REINFORCING BAR, OR OTHER OBSTRUCTIONS WITH NON-DESTRUCTIVE INDICATOR DEVICE AS NECESSARY PRIOR TO SUBMITTING SHOP DRAWINGS. DO NOT DAMAGE OR CUT EXISTING REINFORCING BARS, ELECTRICAL CONDUITS, OR OTHER ITEMS EMBEDDED IN THE EXISTING CONCRETE WITHOUT ACCEPTANCE BY THE DISTRICT.
3. ANCHOR BOLTS IN CONCRETE SHALL BE STAINLESS STEEL AND SHALL HAVE A STANDARD HEAVY HEX BOLT HEAD.
4. ADHESIVE ANCHORS SHALL BE SET IN EXISTING CONCRETE WITH APPROVED ADHESIVE SYSTEM AND STAINLESS STEEL THREADED ROD.
5. REINFORCING STEEL TO BE SET IN EXISTING CONCRETE SHALL BE DOWELED IN CONCRETE WITH APPROVED ADHESIVE SYSTEM.
6. PREPARATION OF THE HOLES AND INSTALLATION OF ADHESIVE ANCHORS AND DOWELS IN EXISTING CONCRETE SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. WELDING SHALL CONFORM TO AWS CODE OF ARC WELDING IN BUILDING CONSTRUCTION. FILLER METAL FOR STAINLESS STEEL SHALL BE E316L, ER316L, OR E316-X, HAVING A MINIMUM OF TENSILE STRENGTH (Fu) OF 80 ksi.
8. FIELD WELDS SHALL BE PROTECTED WITH ZINC STICK.

SPECIAL INSPECTIONS AND TESTINGS

1. SPECIAL INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH THE 2016 CBC, CHAPTER 17 AND PROJECT SPECIFICATIONS FOR FOLLOWING ITEMS:
   - A. STRUCTURAL WELDING
   - B. ANCHOR BOLTS, EXPANSION BOLTS, ADHESIVE ANCHORS, AND DOWELS INSTALLED IN EXISTING CONCRETE
   - C. VERIFICATION OF CONCRETE MIX.
2. PROVIDE TENSION TESTS PER SPECS SECTION 05 50 10 FOR ANCHORS AND DOWELS INSTALLED IN EXISTING CONCRETE.
3. COST OF TESTING, INCLUDING REINSTALLED ANCHORS OR DOWELS DUE TO FAILURE, SHALL BE BORNE BY CONTRACTOR.
4. THE INDEPENDENT TESTING LABAORATORY MUST BE APPROVED BY DISTRICT PRIOR TO BEGINING WORK, SEE SPECS.

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/21
CIVIL
STATE OF CALIFORNIA
02/6/2021

3" ON ORIGINAL DOCUMENT
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NO.	DATE	REVISION	BY	REC.	APP.
3	14MAY2021	ADDENDUM NO.4 PER SD402	DL	GDW	GDW
2	30APR2021	ADDENDUM NO.2 PER SD402	DL	GDW	GDW
1	22APR2021	ADDENDUM NO.1 PER SD402	DL	GDW	GDW

SD402 MWWTP ADMIN, LAB, & DEWATERING BUILDINGS HVAC IMPROVEMENTS

DESIGN BY:	D. LA MARCHE
DRAWN BY:	S. UPSORNSOPAKIT
DESIGN CHECKED BY: R.P.E. No. C65259	GARIN D WARREN
CONSTRUCTABILITY CHECKED BY:	WILLIAM E. CHAFFER
ELECTRICAL CHECKED BY: R.P.E. No.	---
PROJECT ENGINEER R.P.E. No. C87358	DOMINIC LA MARCHE
PROJECT MANAGER R.P.E. No. C87358	DOMINIC LA MARCHE
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259	GARIN D WARREN

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT

GENERAL
INDEX OF DRAWINGS AND GENERAL NOTES

SHEET NO.01

SCALE NONE
DATE 16FEB2021

SD402-G-001
DRAWING NUMBER

3
REV.

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DATE: 19-MAY-2021 10:07
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REF 4:
REF 5:
REF 6:
REF 7:
REF 8:
REF 9:

ADMINISTRATION AND LABORATORY BUILDING DRAWINGS

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DATE: 08-FEB-2021 16:02
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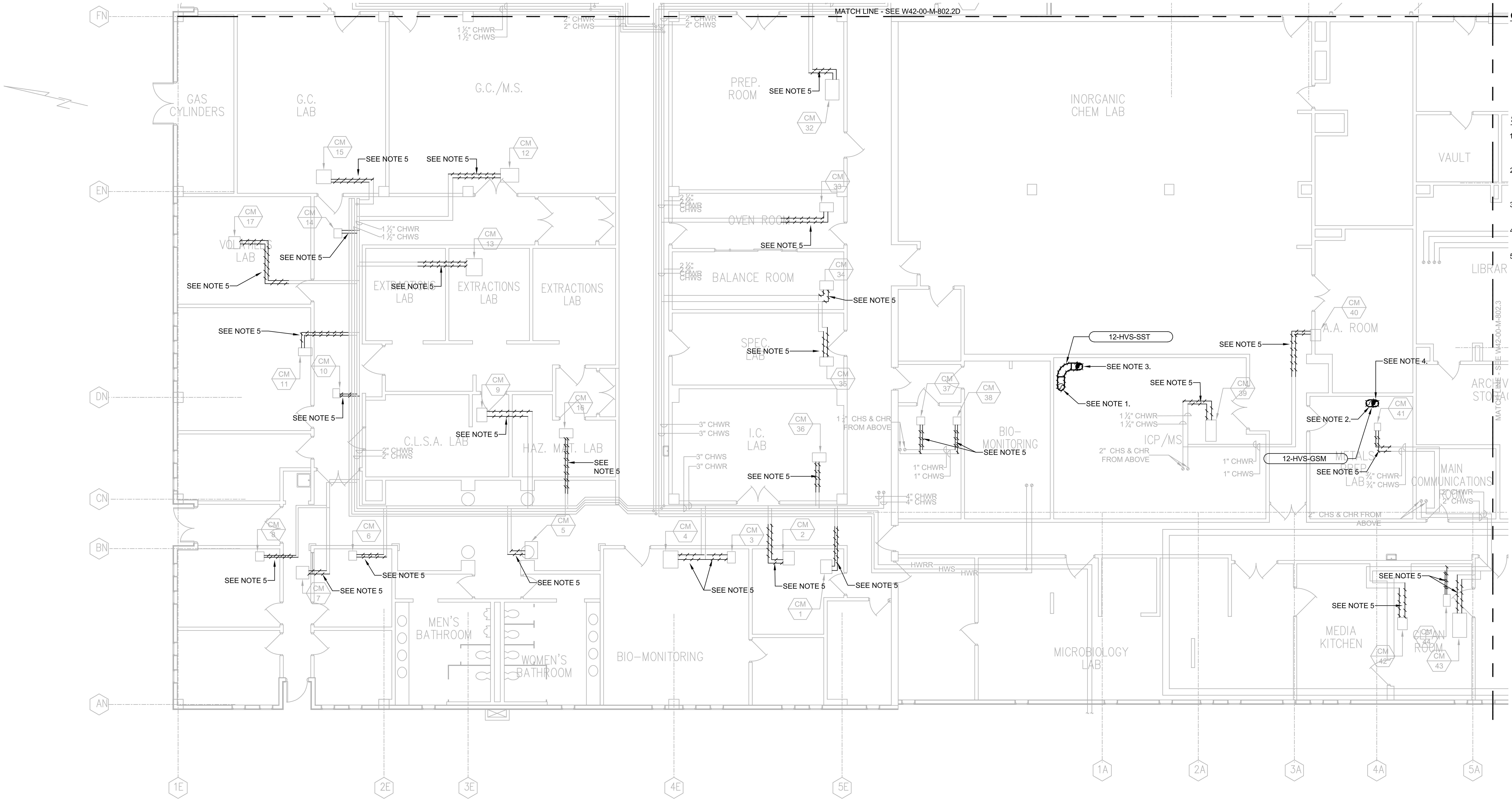

1 **DEMOLITION PLAN**
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES FOR WORK RESTRICTIONS INSIDE BUILDING.

SHEET NOTES:

1. DISCONNECT EXHAUST DUCTWORK FROM FUME HOOD. PRESERVE (E) FUME HOOD DUCTWORK CONNECTION FOR REUSE.
2. DISCONNECT EXHAUST DUCTWORK FROM CANOPY HOOD. PRESERVE (E) CANOPY HOOD DUCTWORK CONNECTION FOR REUSE.
3. DEMOLISH AND REMOVE STAINLESS STEEL EXHAUST AIR THROUGH ROOF.
4. DEMOLISH AND REMOVE DUCTWORK CANOPY DUCTWORK THROUGH ROOF.
5. DEMOLISH AND REMOVE (E) PIPE INSULATION. EXISTING PIPING TO REMAIN. INSPECT (E) PIPING FOR LEAKS AND REPAIR AS NEEDED.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

M 28479 REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG MECHANICAL STATE OF CALIFORNIA
EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

SUPERSEDES PORTION OF M2.1, R0 (SD185) AND M2.4, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

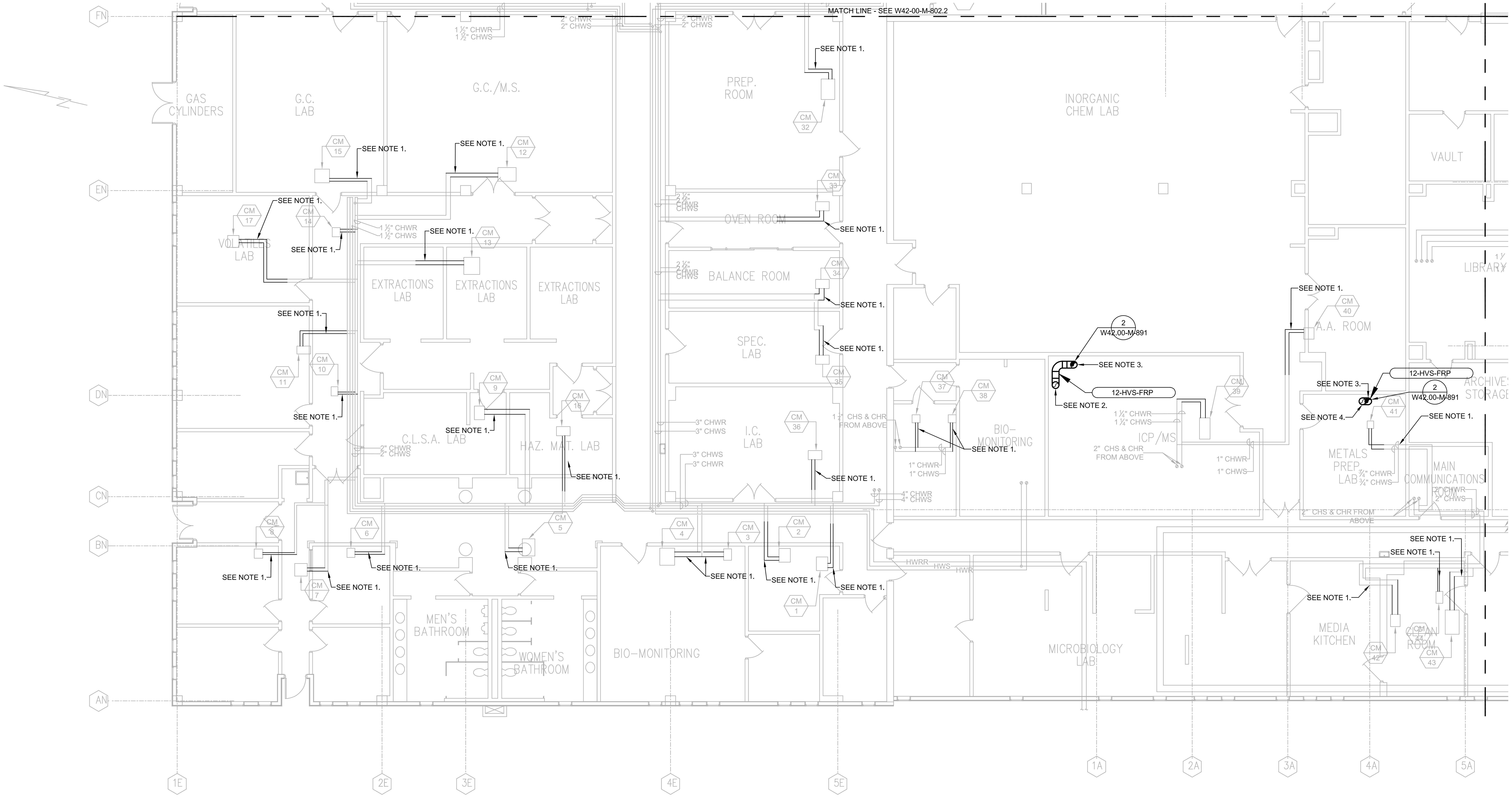
EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DEMOLITION FIRST FLOOR PLAN – AREA 1

SHEET NO. 17

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–802.1D
DRAWING NUMBER
0
REV.



1 HVAC PLAN AREA 1
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. ALL PIPING AND COIL MODULES SHOWN ON DRAWING ARE EXISTING.

B. REFER TO SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES FOR WORK RESTRICTIONS INSIDE BUILDING.

SHEET NOTES:

1. CONTRACTOR TO REINSULATE THE BRANCH PIPING AND ALL VALVE ASSEMBLIES OF EACH COIL MODULE. EXTEND NEW INSULATION UP TO EXISTING COIL MODULE FACE. APPLY VAPOR BARRIER TO ALL JOINTS.
2. CONNECT DUCTWORK TO (E) FUMEHOOD
3. DUCTWORK UP THROUGH ROOF.
4. CONNECT (N) DUCTWORK TO (E) CANOPY HOOD.

REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA
EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

SUPERSEDES PORTION OF M2.1, R0 (SD185) AND M2.4, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
PROJECT MANAGER JULIAN HO R.P.E.No. M39800
APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC FIRST FLOOR PLAN AREA – 1

SHEET NO. 18

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–802.1 DRAWING NUMBER
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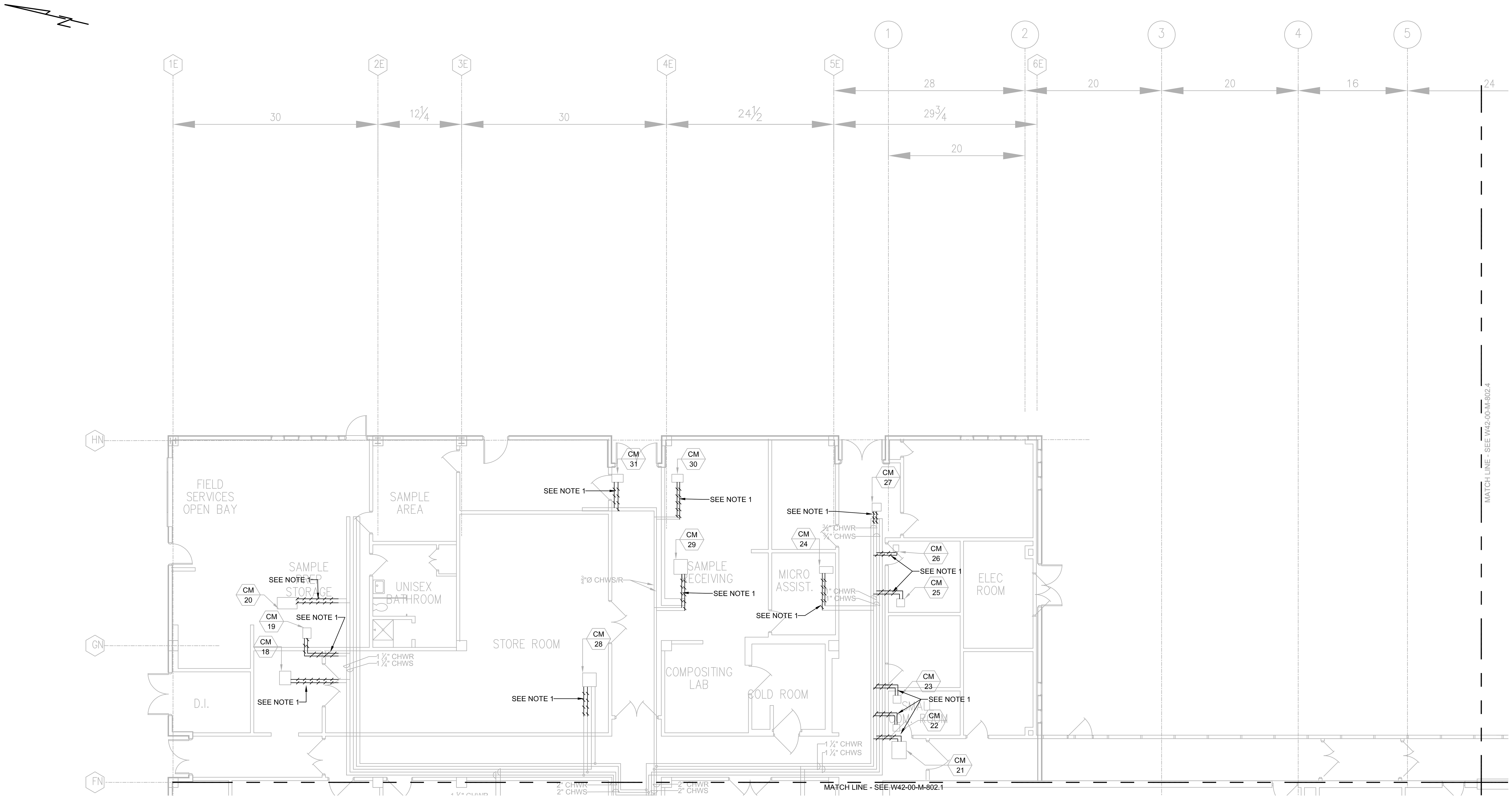

1 DEMOLITION PLAN AREA 2
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES FOR WORK RESTRICTIONS INSIDE BUILDING.

SHEET NOTES:

1. DEMOLISH AND REMOVE (E) PIPE INSULATION. EXISTING PIPING TO REMAIN. INSPECT (E) PIPING FOR LEAKS AND REPAIR AS NEEDED.

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
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SUPERSEDES PORTION OF M2.2, R0 (SD185) AND M2.3, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

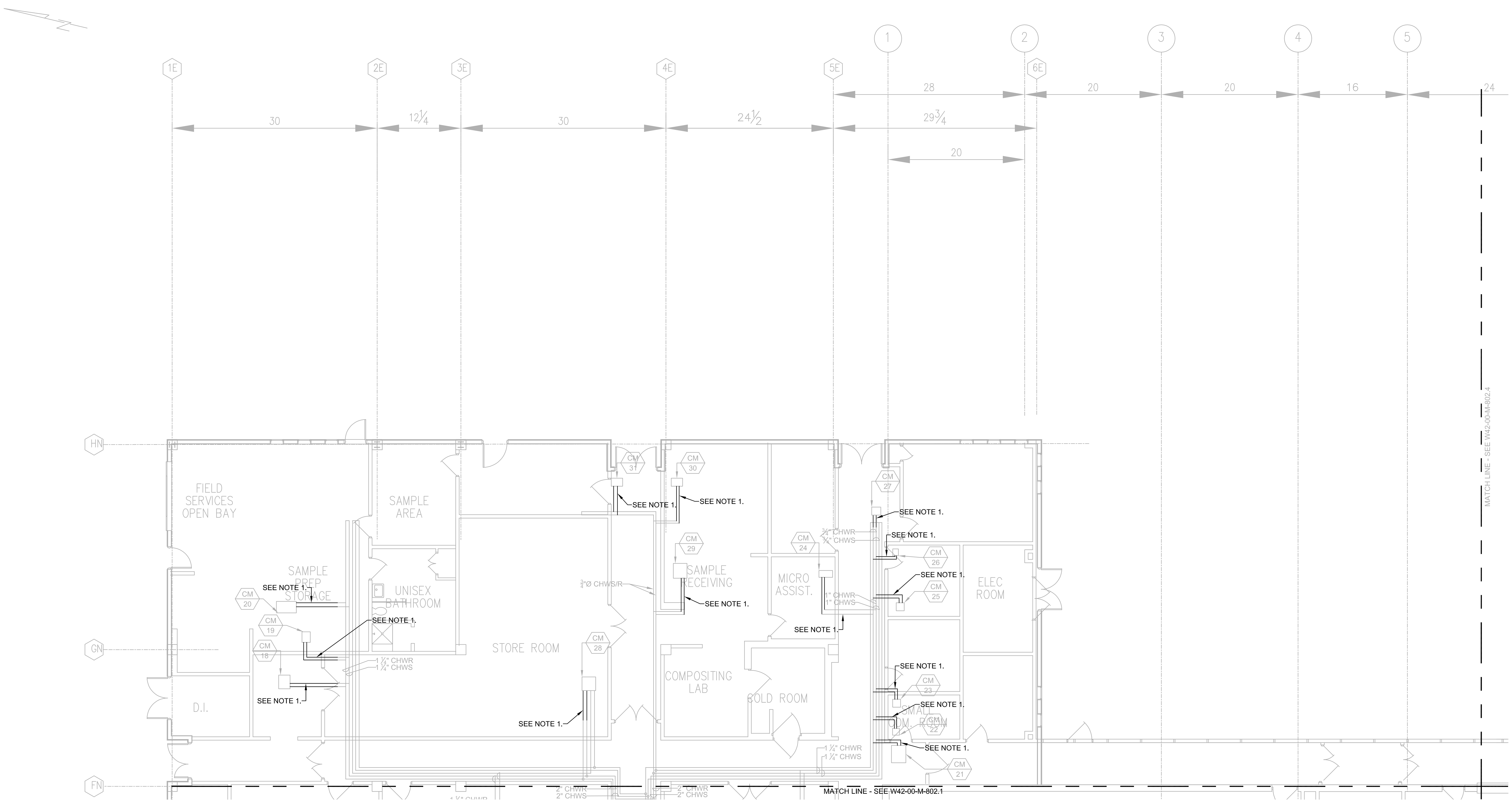
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DEMOLITION FIRST FLOOR PLAN
AREA – 2

SHEET NO. 19

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–802.2D
DRAWING NUMBER
0
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$



1 **HVAC PLAN AREA 2**
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. ALL PIPING AND COIL MODULES SHOWN ON DRAWING ARE EXISTING.

B. REFER TO SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES FOR WORK RESTRICTIONS INSIDE BUILDING.

SHEET NOTES:

1. CONTRACTOR TO REINSULATE THE BRANCH PIPING AND ALL VALVE ASSEMBLIES OF EACH COIL MODULE. EXTEND NEW INSULATION UP TO EXISTING COIL MODULE FACE.APPLY VAPOR BARRIER TO ALL JOINTS.

REGISTERED PROFESSIONAL ENGINEER — DAVID TAT MING PANG — M 28479 — MECHANICAL — STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

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SUPERSEDES PORTION OF M2.2, R0 (SD185) AND M2.3, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
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PRINCIPAL IN CHARGE
R.P.E. No. M28479

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R.P.E. No. C87358
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R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC FIRST FLOOR PLAN AREA – 2

SHEET NO. 20

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–802.2
DRAWING NUMBER
REV. 0

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REF 8: REF8$FILENAME
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REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
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DATE: $$$$$$DATE$$$$$$
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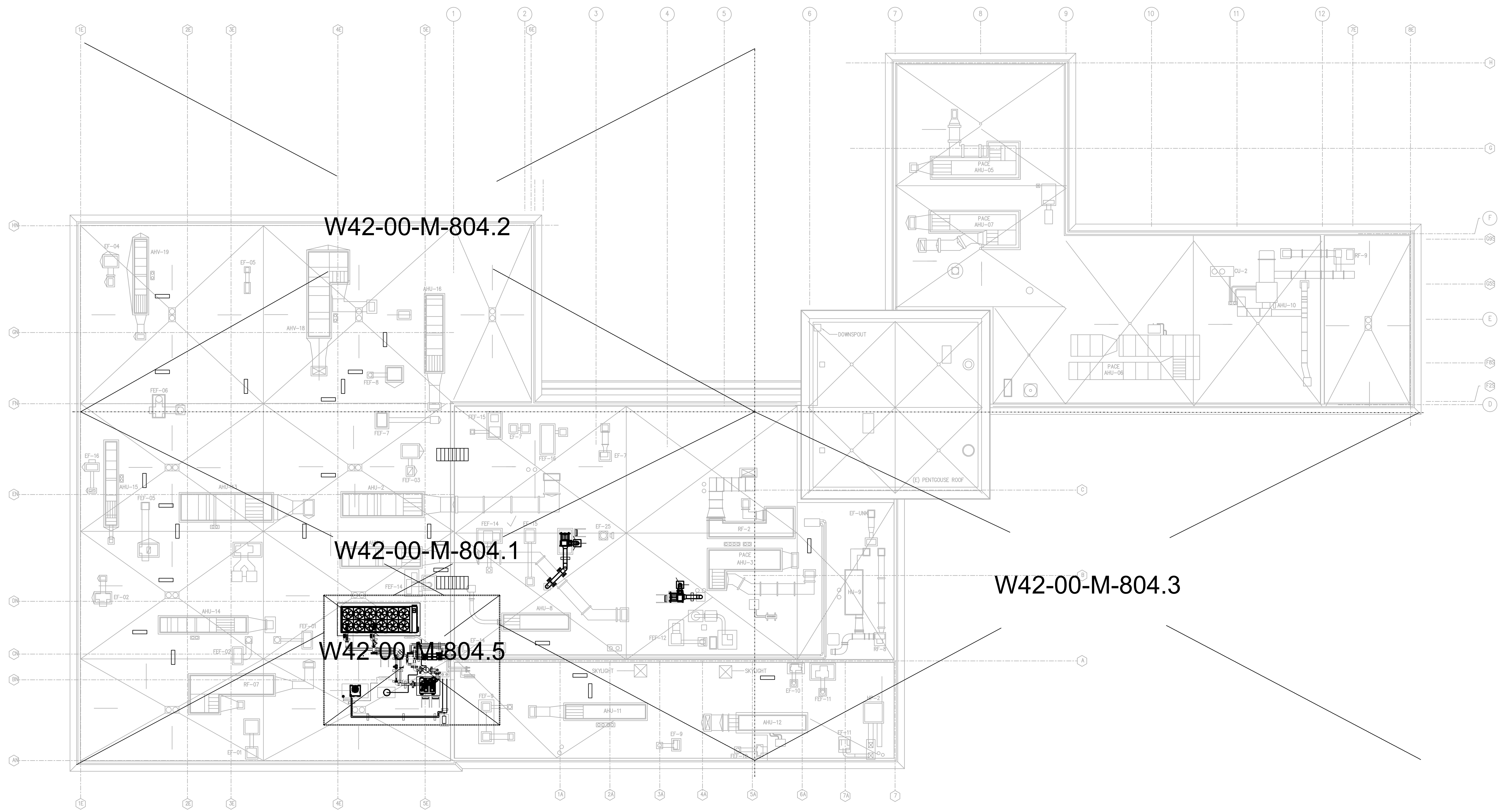

1 OVERALL ROOF PLAN
SCALE: 1/16" = 1'-0"

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
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NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
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SR. ENGINEER
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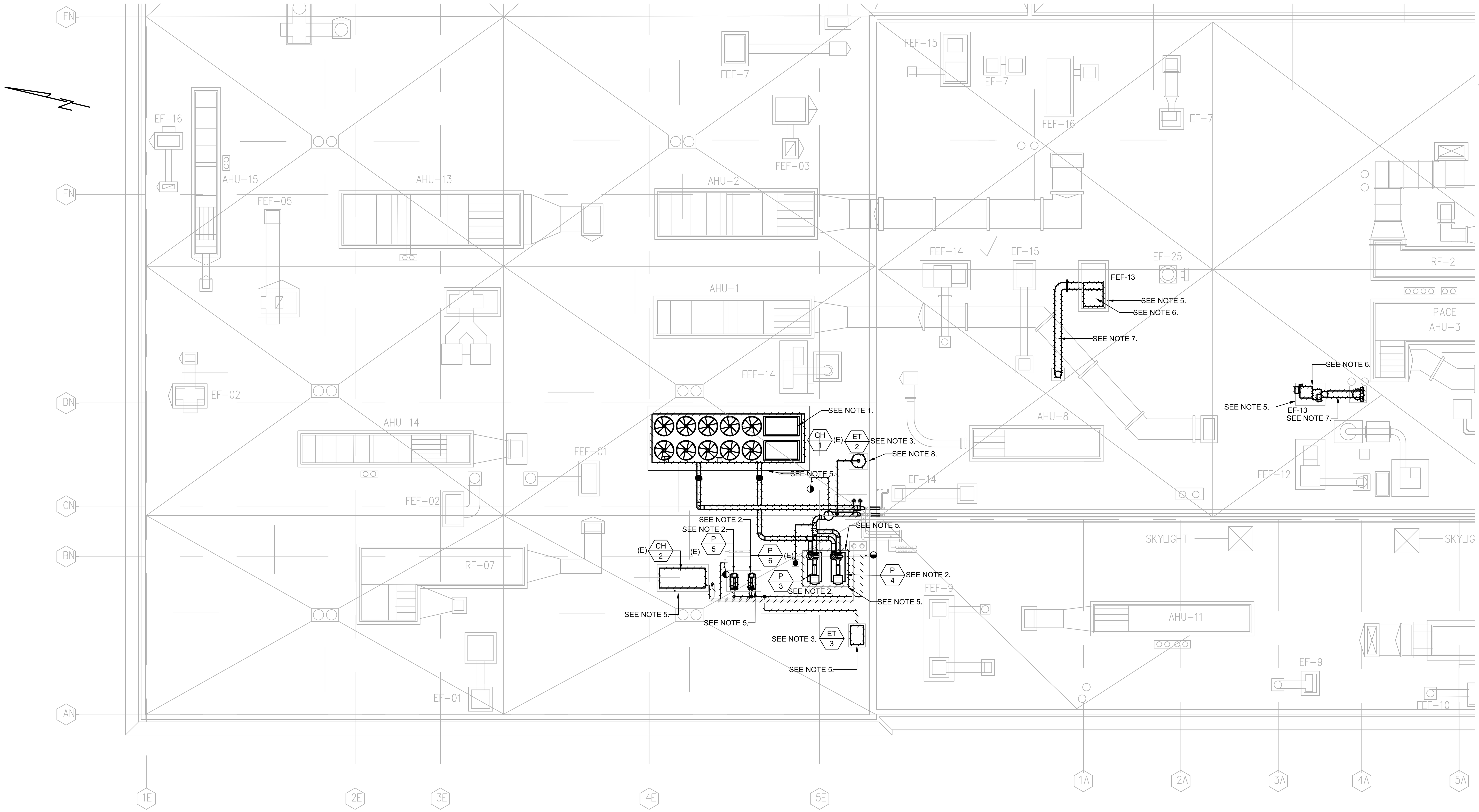
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC OVERALL ROOF PLAN

SHEET NO. 21

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–804
DRAWING NUMBER
0
REV.



1 ROOF DEMOLITION PLAN AREA - 1
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO SEQUENCING SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES.

SHEET NOTES:

1. DEMOLISH AND REMOVE (E) MCQUAY AIR COOLED CHILLER, SUPPORTS AND ACCESSORIES
2. DEMOLISH AND REMOVE (E) PUMPS, SUPPORTS AND ACCESSORIES.
3. DEMOLISH AND REMOVE (E) EXPANISON TANK
4. DEMOLISH AND REMOVE (E) AIR SEPARATOR.
5. PRESERVE (E) CURB
6. DEMOLISH AND REMOVE (E) EXHAUST FAN AND ASSOCIATED SUPPORTS AND ACCESSORIES
7. DEMOLISH AND REMOVE (E) DUCTWORK AND ASSOCIATED SUPPORTS AND ACCESSORIES
8. DEMOLISH AND REMOVE (E) CURB

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
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USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

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SUPERSEDES PORTION OF M3.1, R0 (SD185) AND M3.2, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
ROOF DEMOLITION PLAN AREA – 1

SHEET NO. 22

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–804.1.D
DRAWING NUMBER
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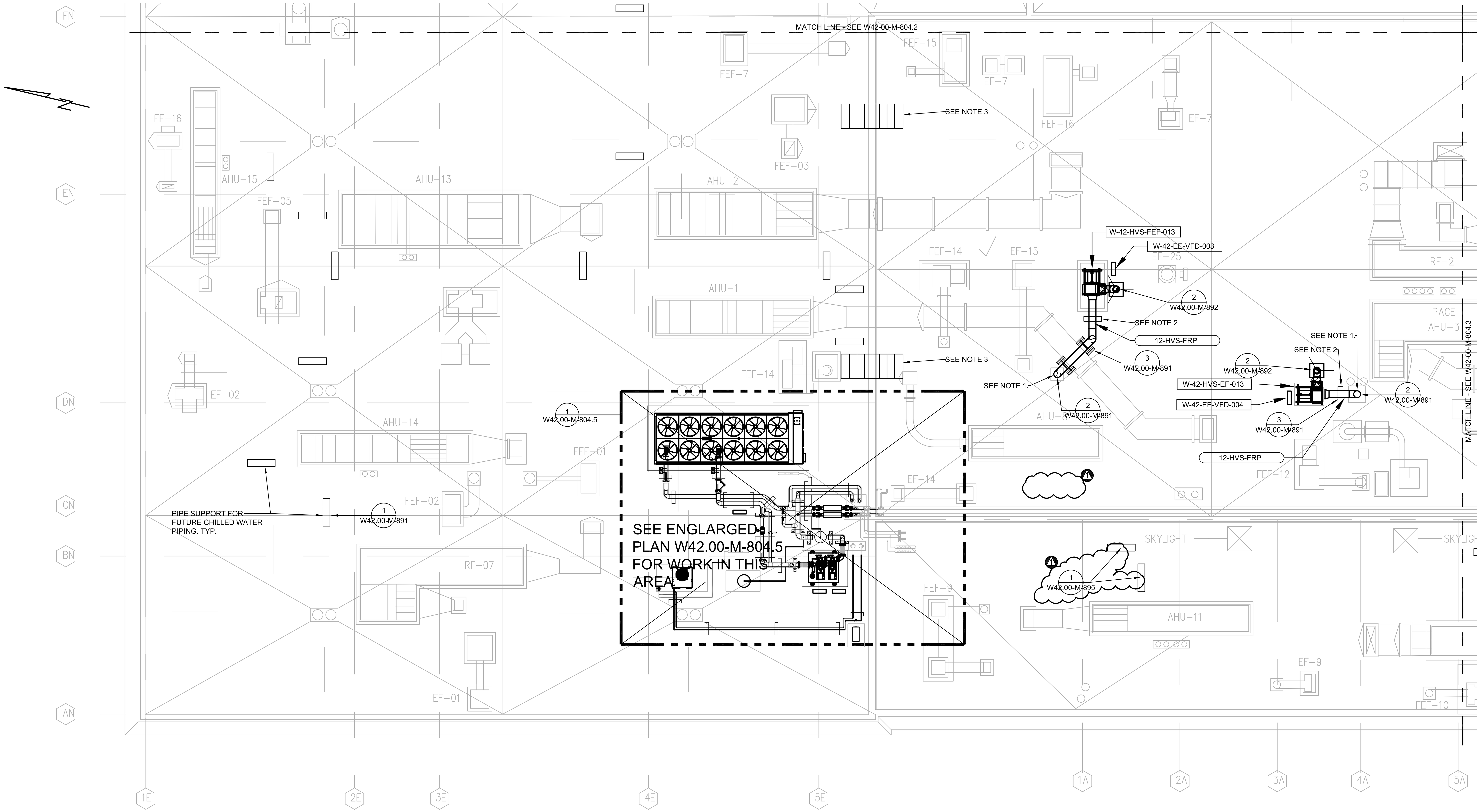
REV.



1 HVAC ROOF PLAN AREA 1
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO SEQUENCING SPECIFICATION 013513 SPECIAL PROJECT PROCEDURES.

SHEET NOTES:

1. DUCTWORK DOWN THROUGH (E) ROOF.
2. SLEEPER TYPE SUPPORT
3. SEE ARCHITECTURAL SHEETS FOR STAIRS

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
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DATE: $$$$$$DATE$$$$$$
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3" ON ORIGINAL DOCUMENT
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REG. PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA
EXP. DATE: JUNE 30, 2021

SUPERSEDES PORTION OF M3.1, R0 (SD185) AND M3.2, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
1	14MAY2021	ADDENDUM NO.4	JH	GW	DP
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

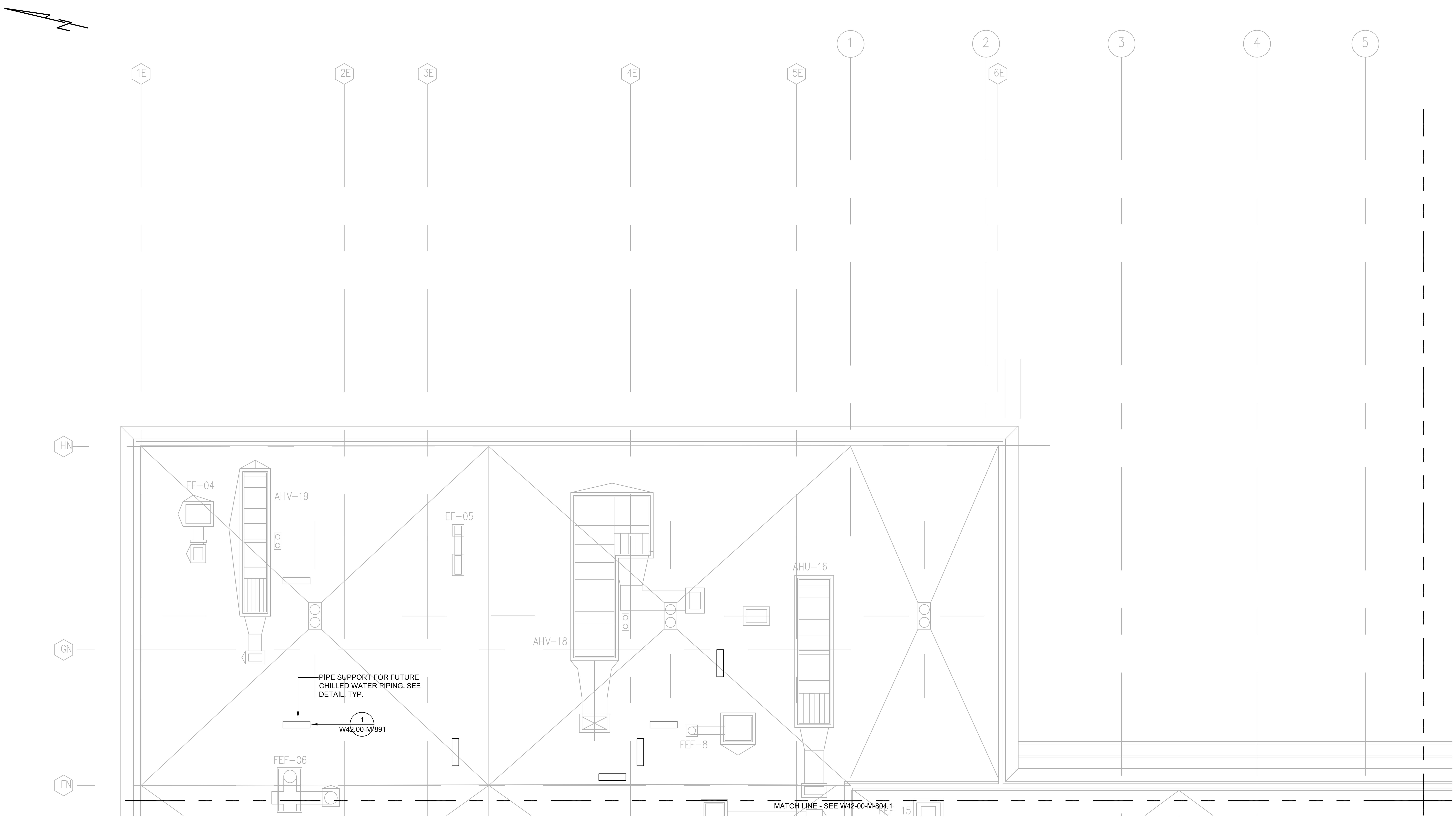
EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC ROOF PLAN AREA – 1

SHEET NO. 23

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–804.1
DRAWING NUMBER
1
REV.



1 HVAC ROOF PLAN AREA 2
SCALE: 1/8" = 1'-0"

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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
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REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

3" ON ORIGINAL DOCUMENT
0 1 2 3

REGISTERED PROFESSIONAL ENGINEER
DAVID TAT MING PANG
M 28479
MECHANICAL
STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

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SUPERSEDES PORTION OF M3.1, R0 (SD185) AND M3.2, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC ROOF PLAN AREA – 2

SHEET NO. 24

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–804.2
DRAWING NUMBER
0
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
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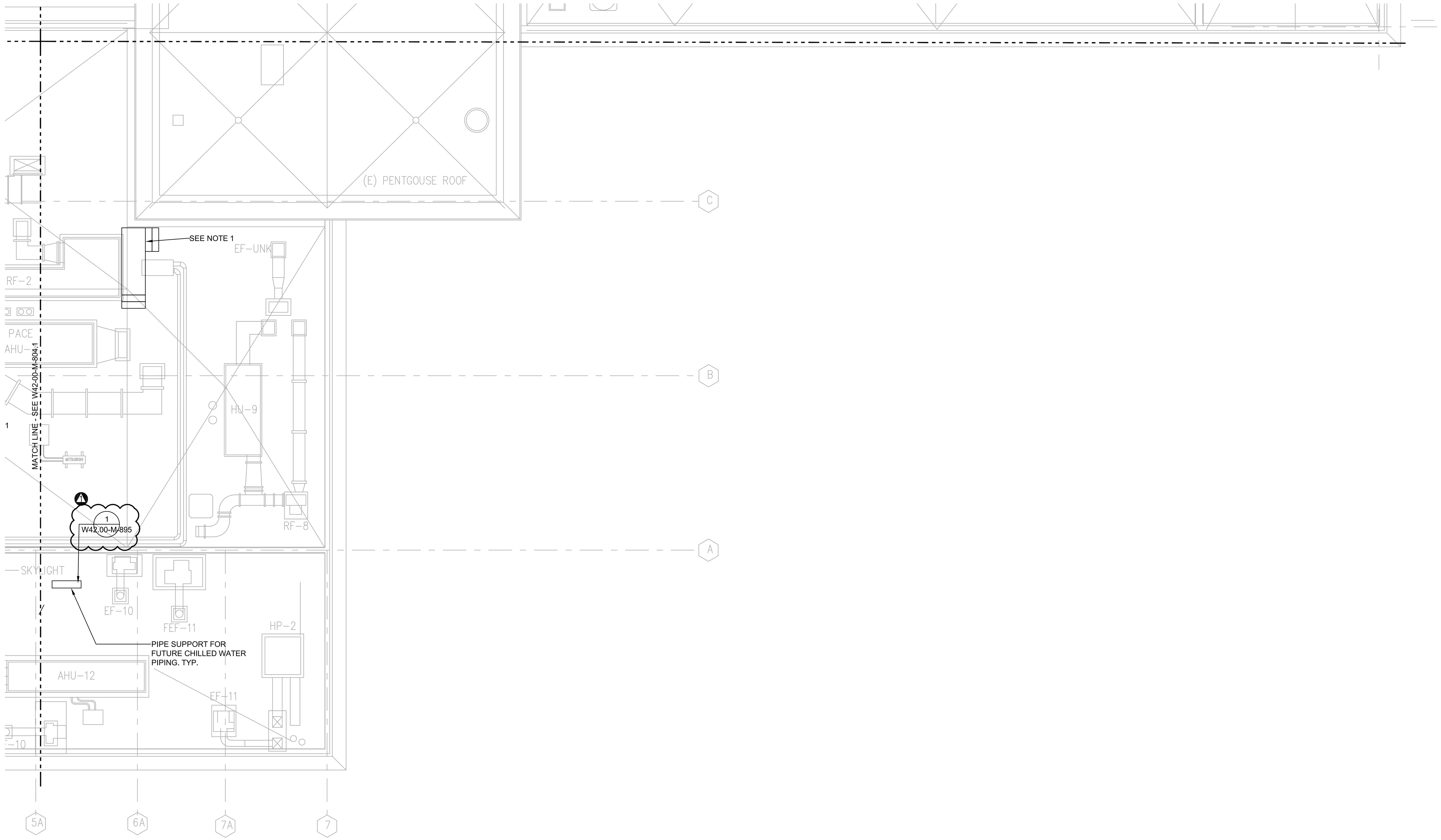
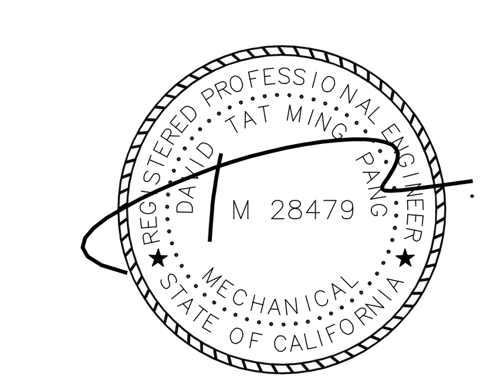


SHEET NOTES:

1. SEE ARCHITECTURAL SHEETS FOR STAIRS

1 HVAC ROOF PLAN AREA 3
SCALE: 1/8" = 1'-0"



EXP. DATE: JUNE 30, 2021

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SUPERSEDES PORTION OF M3.1, R0 (SD185) AND M3.2, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
1	14MAY2021	ADDENDUM NO.4	JH	GW	DP
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
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R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
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RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
HVAC ROOF PLAN AREA – 3

SHEET NO. 25

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–804.3
DRAWING NUMBER
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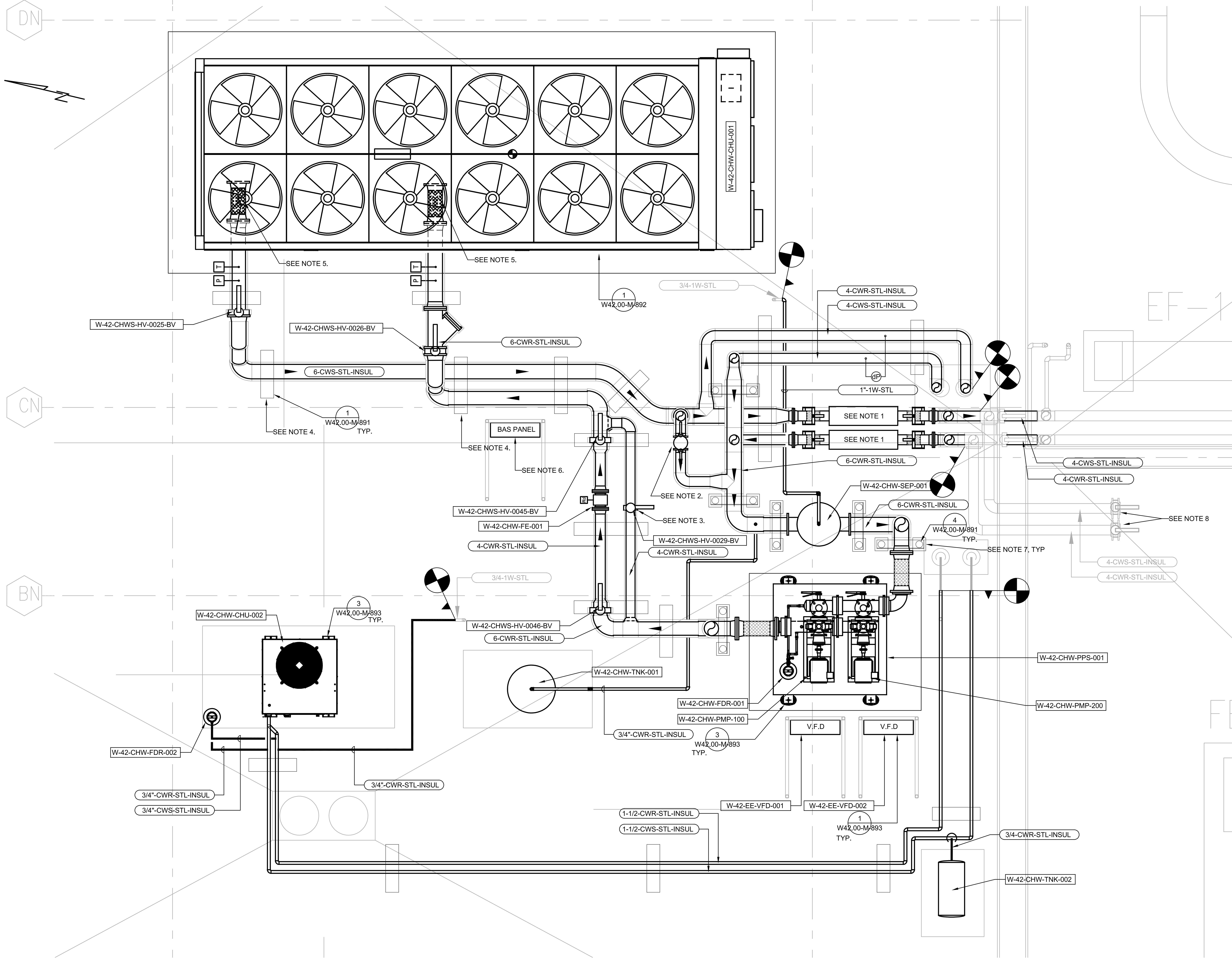
REV.



① **ENLARGED CHILLER YARD ROOF PLAN**
SCALE: 1/2" = 1'-0"

SHEET NOTES:

1. INLINE SEISMIC MOVEMENT JOINT. METRAFLEX SEISMIC GATOR OR EQ.
2. BYPASS CONTROL VALVE FOR MINIMUM CHILLER FLOW CONTROL
3. SHUTOFF VALVES AND TEMPORARY T CONNECTION INSTALLED DURING DEMOLITION
4. SLEEPER PIPE SUPPORT
5. FLEXIBLE CONNECTION TO CHILLER EVAPORATOR LOCATED UNDERNEATH CONDENSER COILS
6. BUILDING AUTOMATION CONTROL PANEL FOR CHILLED WATER SYSTEM IN NEMA 4X ENCLOSURE. SUPPORT SIMILAR TO VFD PER DETAIL 1/W42.00-M-893
7. ELEVATED PIPE SUPPORT
8. EXISTING SHUTOFF VALVES FOR CONNECTION TO TEMPORARY CHILLER

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

REGISTERED PROFESSIONAL ENGINEER — DAVID TAT MING PANG — M 28479 — MECHANICAL — STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

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NO.	DATE	REVISION	BY	REC.	APP.
0	04FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
ENLARGED CHILLER PLAN

SHEET NO. 26

SCALE AS NOTED
DATE 02/FEB/2021
W42.00–M–804.5
DRAWING NUMBER
REV. 0

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
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REF 6: REF6$FILENAME
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PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
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SUPERSEDES PORTION OF; M5.1, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

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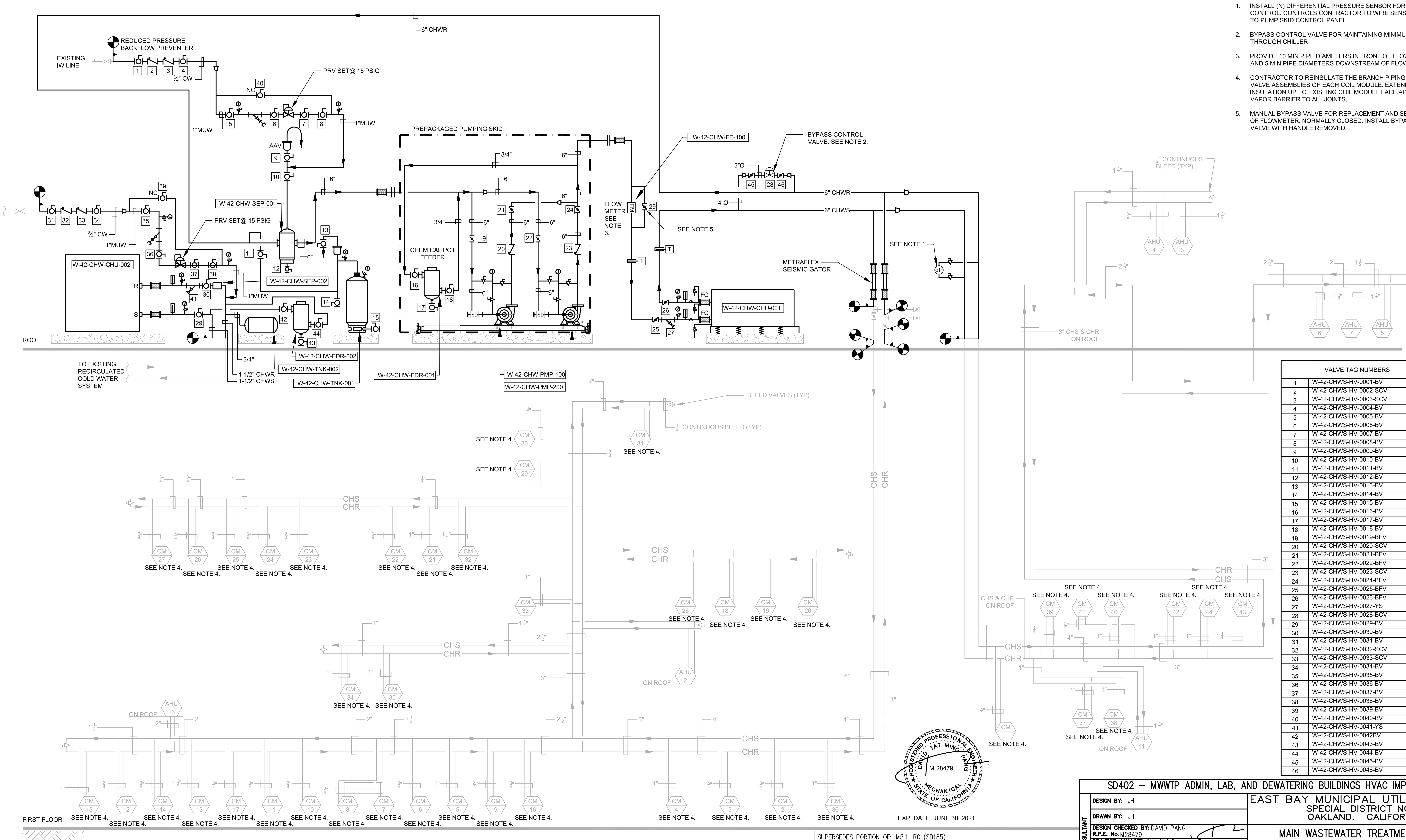
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DEMOLITION CHILLED WATER PIPING DIAGRAM

SHEET NO. 27
SCALE AS NOTED
DATE 03/FEB/2021
W42.00-M-851D
DRAWING NUMBER
0
REV.



SHEET NOTES:

1. INSTALL (N) DIFFERENTIAL PRESSURE SENSOR FOR PUMP CONTROL. CONTROLS CONTRACTOR TO WIRE SENSOR BACK TO PUMP SKID CONTROL PANEL
2. BYPASS CONTROL VALVE FOR MAINTAINING MINIMUM FLOW THROUGH CHILLER
3. PROVIDE 10 MIN PIPE DIAMETERS IN FRONT OF FLOW METER AND 5 MIN PIPE DIAMETERS DOWNSTREAM OF FLOW METER.
4. CONTRACTOR TO REINSULATE THE BRANCH PIPING AND ALL VALVE ASSEMBLIES OF EACH COIL MODULE. EXTEND NEW INSULATION UP TO EXISTING COIL MODULE FACE.APPLY VAPOR BARRIER TO ALL JOINTS.
5. MANUAL BYPASS VALVE FOR REPLACEMENT AND SERVICING OF FLOWMETER. NORMALLY CLOSED. INSTALL BYPASS VALVE WITH HANDLE REMOVED.

VALVE TAG NUMBERS	
1	W-42-CHWS-HV-0001-BV
2	W-42-CHWS-HV-0002-SCV
3	W-42-CHWS-HV-0003-SCV
4	W-42-CHWS-HV-0004-BV
5	W-42-CHWS-HV-0005-BV
6	W-42-CHWS-HV-0006-BV
7	W-42-CHWS-HV-0007-BV
8	W-42-CHWS-HV-0008-BV
9	W-42-CHWS-HV-0009-BV
10	W-42-CHWS-HV-0010-BV
11	W-42-CHWS-HV-0011-BV
12	W-42-CHWS-HV-0012-BV
13	W-42-CHWS-HV-0013-BV
14	W-42-CHWS-HV-0014-BV
15	W-42-CHWS-HV-0015-BV
16	W-42-CHWS-HV-0016-BV
17	W-42-CHWS-HV-0017-BV
18	W-42-CHWS-HV-0018-BV
19	W-42-CHWS-HV-0019-BFV
20	W-42-CHWS-HV-0020-SCV
21	W-42-CHWS-HV-0021-BFV
22	W-42-CHWS-HV-0022-BFV
23	W-42-CHWS-HV-0023-SCV
24	W-42-CHWS-HV-0024-BFV
25	W-42-CHWS-HV-0025-BFV
26	W-42-CHWS-HV-0026-BFV
27	W-42-CHWS-HV-0027-YS
28	W-42-CHWS-HV-0028-BCV
29	W-42-CHWS-HV-0029-BV
30	W-42-CHWS-HV-0030-BV
31	W-42-CHWS-HV-0031-BV
32	W-42-CHWS-HV-0032-SCV
33	W-42-CHWS-HV-0033-SCV
34	W-42-CHWS-HV-0034-BV
35	W-42-CHWS-HV-0035-BV
36	W-42-CHWS-HV-0036-BV
37	W-42-CHWS-HV-0037-BV
38	W-42-CHWS-HV-0038-BV
39	W-42-CHWS-HV-0039-BV
40	W-42-CHWS-HV-0040-BV
41	W-42-CHWS-HV-0041-YS
42	W-42-CHWS-HV-0042BV
43	W-42-CHWS-HV-0043-BV
44	W-42-CHWS-HV-0044-BV
45	W-42-CHWS-HV-0045-BV
46	W-42-CHWS-HV-0046-BV

REGISTERED PROFESSIONAL ENGINEER
DAVID TAT MING PANG
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EXP. DATE: JUNE 30, 2021

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SUPERSEDES PORTION OF; M5.1, R0 (SD185)

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
CHILLED WATER PIPING DIAGRAM

SHEET NO. 28

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–851
DRAWING NUMBER
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REV.

REF 7: REF7$FILENAME
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REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
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SEQUENCE OF OPERATION:

GENERAL CONTROL SEQUENCE
THE BAS SYSTEM SHALL START THE CHILLED WATER SYSTEM WHEN THERE IS A COOLING DEMAND FROM ANY OF THE AIR HANDLING UNITS AND OUTSIDE AIR IS HIGHER THAN 60°F DEGREE. UPON A SYSTEM START COMMAND IS ISSUED, THE BAS SYSTEM SHALL START THE LEAD PUMP. WHEN FLOW IS PROVEN BY THE FLOW SWITCH, THE BAS SYSTEM SHALL START THE CHILLER WITH A DELAY(1 MINUTE, ADJUSTABLE). THE CHILLER'S FACTORY INTERNAL CONTROLLER SHALL MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT (44°F, ADJUSTABLE).

IF THE CHILLED WATER SUPPLY TEMPERATURE DEVIATES MORE THAN 2°F FROM THE SETPOINT FOR MORE THAN 20 MINUTES AFTER 30 MINUTES FROM THE START-UP OF THE CHILLER PLANT, THE BAS SYSTEM SHALL ISSUE AN ALARM.

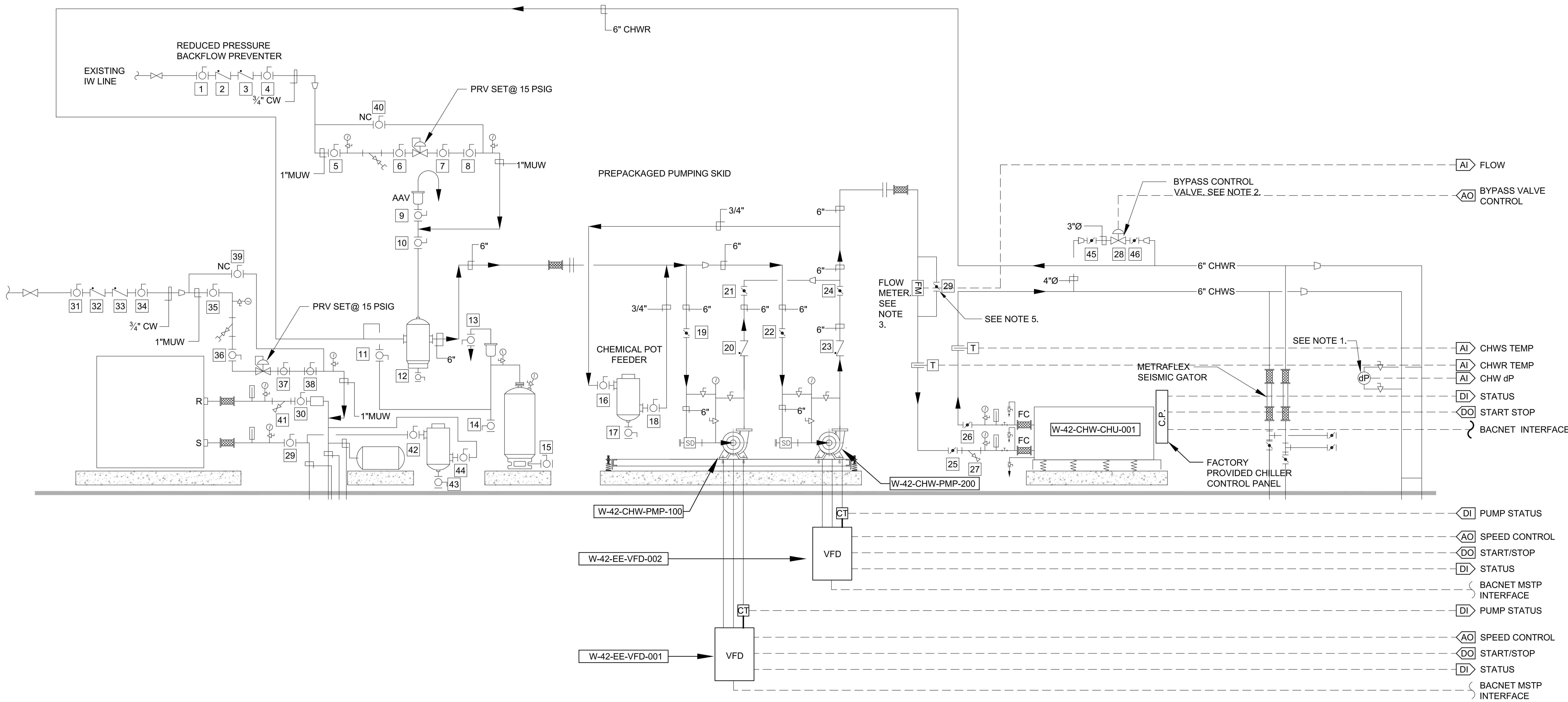
CHILLER-BAS BACNET INTERFACE
THE BAS SYSTEM SHALL COMMUNICATE WITH THE CHILLER FACTORY CONTROLLER THROUGH A BACNET INTERFACE. THE MINIMUM INFORMATION EXTRACTED FROM THE CHILLER FACTORY CONTROLLER SHALL INCLUDE THE FOLLOWING:
1. CHILLER KW
2. CHILLED WATER SUPPLY TEMPERATURE
3. CHILLED WATER SUPPLY SETPOINT
4. CHILLED WATER RETURN TEMPERATURE
5. AMP
6. AVERAGE MOTOR CURRENT %RLA
7. CIRCUIT 1- SATURATED REFRIGERANT TEMPERATURE
8. CIRCUIT 1 - REFRIGERANT PRESSURE (PSI)
9. CIRCUIT 2- SATURATED REFRIGERANT TEMPERATURE
10. CIRCUIT 2 - REFRIGERANT PRESSURE (PSI)
11. COMPRESSOR 1 RUNNING STATUS
12. COMPRESSOR 2 RUNNING STATUS
13. OIL LOSS LEVEL SENSOR STATUS
14. EVAPORATOR REFRIGERANT PRESSURE
15. CONDENSER REFRIGERANT PRESSURE
16. DIFFERENTIAL REFRIGERANT PRESSURE
17. VFD COMPRESSOR FREQUENCY COMMAND
18. ALL ALARMS AVAILABLE FROM CHILLER CONTROL PANEL

CHILLED WATER PUMPING SEQUENCE
THE TWO CHILLED WATER PUMPS SHALL OPERATE AS A ONE-OPERATING-ONE STANDBY CONFIGURATION. IF THE LEAD PUMP FAILS TO START, THE BAS SYSTEM SHALL START THE STANDBY PUMP AND ISSUE AN ALARM. THE BAS SYSTEM SHALL MODULATE THE PUMP VFD TO MAINTAIN THE SYSTEM DIFFERENTIAL PRESSURE SETPOINT VIA THE DIFFERENTIAL PRESSURE SENSOR INSTALLED WHERE INDICATED ON DRAWINGS.

THE BAS SYSTEM SHALL ROTATE THE PUMP DUTY (OPERATING AND STANDBY) BASED ON A WEEKLY BASIS FOR EVEN WEAR.

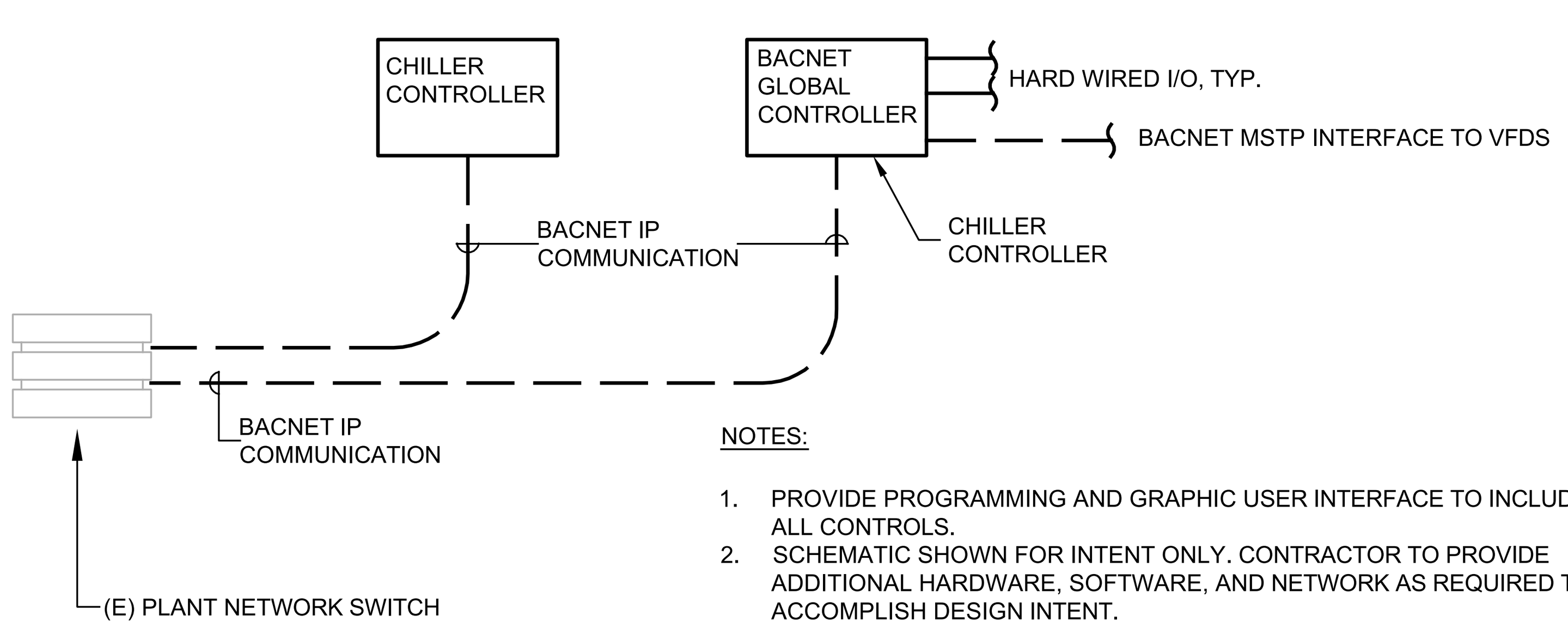
BYPASS CONTROL VALVE SEQUENCE
THE BYPASS VALVE SHALL BE CLOSED WHEN THE CHILLER PLANT IS DISABLED. AFTER THE STARTUP OF THE CHILLER PLANT, THE BAS SHALL MODULATE THE BYPASS VALVE TO MAINTAIN THE MINIMUM CHILLED WATER FLOW THROUGH THE CHILLER (150 GPM, ADJUSTABLE) BY A PRESSURE DROP-FLOW RATE CURVE PROGRAMMED IN THE BAS CONTROLLER BY THE CONTROLS CONTRACTOR. THE CONTROLS CONTRACTOR SHALL OBTAIN THE PRESSURE DROP-FLOW RATE DATA FROM THE CHILLER VENDOR TO IMPLEMENT THIS CONTROLS. THE CONTROLS SEQUENCE SHALL LOOK UP THE CORRESPONDING FLOW RATE BASED ON THE MEASURE DIFFERENTIAL PRESSURE ACROSS THE CHILLER.

CHILLED WATER SUPPLY TEMPERATURE RESET SEQUENCE
THE BAS SYSTEM SHALL RESET THE CHILLED WATER SUPPLY TEMPERATURE BASED ON DEMAND OF THE SYSTEM. IF NONE OF THE CHILLED WATER CONTROL VALVES ARE MORE THAN 85% (ADJUSTABLE) OPEN FOR MORE THAN 5 MINUTES (ADJUSTABLE), THE BAS SYSTEM SHALL RAISE THE SUPPLY TEMPERATURE BY 0.5°F (ADJUSTABLE). IF THE ONE OR MORE OF THE CHILLED CONTROL VALVES IS 95% OPEN OR MORE FOR MORE THAN 10 MINUTES AND ONE OF MORE ZONES' TEMPERATURE SETPOINT IS NOT MET, THEN THE BAS SYSTEM SHALL LOWER THE SUPPLY TEMPERATURE BY 1°F (ADJUSTABLE).



1 CHILLED WATER SYSTEM CONTROL DIAGRAM

SCALE: N.T.S

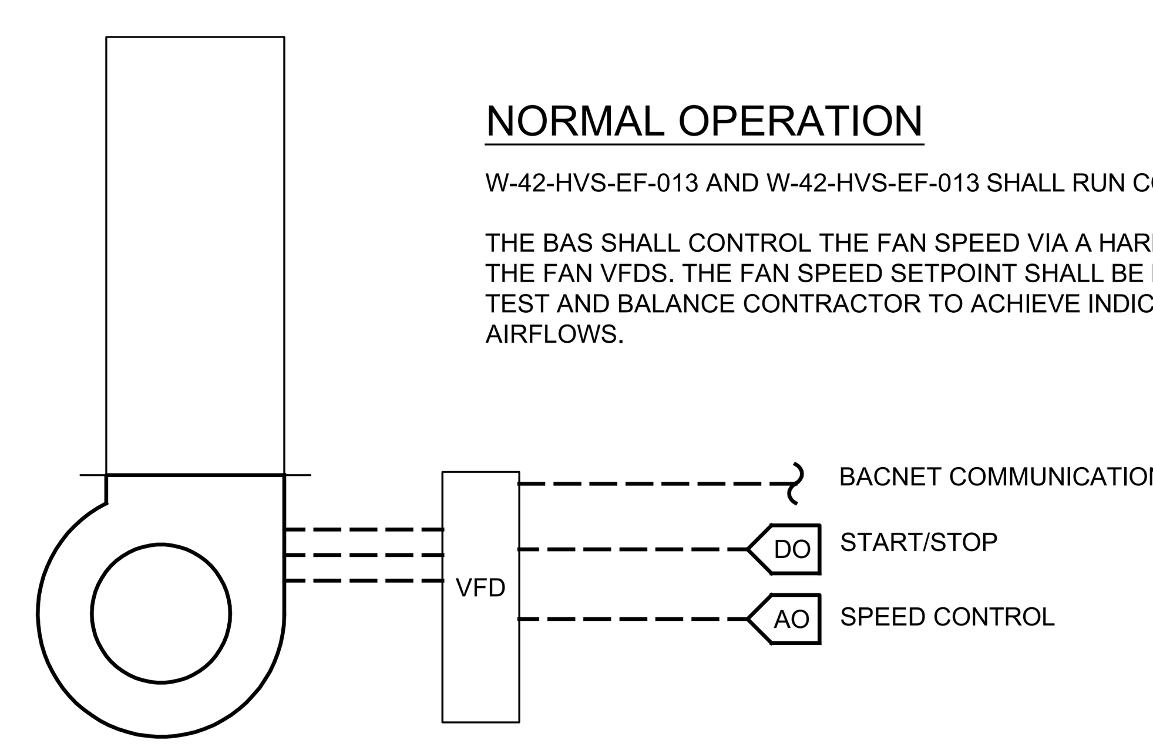


NOTES:

1. PROVIDE PROGRAMMING AND GRAPHIC USER INTERFACE TO INCLUDE ALL CONTROLS.
2. SCHEMATIC SHOWN FOR INTENT ONLY. CONTRACTOR TO PROVIDE ADDITIONAL HARDWARE, SOFTWARE, AND NETWORK AS REQUIRED TO ACCOMPLISH DESIGN INTENT.
3. PROVIDE ADDITIONAL TRANSFORMERS, SWITCHES AND RELAYS AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONAL AND OPERATIONAL SYSTEM.
4. PROVIDE GRAPHICS FOR ALL THE HVAC EQUIPMENT. COORDINATE WITH THE OWNER FOR THE PARAMETERS THAT ARE REQUIRED TO BE INCLUDED IN THE GRAPHICS.

2 BAS AUTOMATION SYSTEM ARCHITECUTRE

SCALE: N.T.S



NORMAL OPERATION

W-42-HVS-EF-013 AND W-42-HVS-EF-013 SHALL RUN CONTINUOUSLY.

THE BAS SHALL CONTROL THE FAN SPEED VIA A HARD WIRED SIGNAL TO THE FAN VFDS. THE FAN SPEED SETPOINT SHALL BE DETERMINED BY THE TEST AND BALANCE CONTRACTOR TO ACHIEVE INDICATED ZONE AIRFLOWS.

3 EXHAUST FAN CONTROL DIAGRAM

SCALE: N.T.S

REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

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SPECIAL DISTRICT NO. 1
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ADMINISTRATION BLDG/LABORATORY
MECHANICAL
CHILLED WATER SYSTEM CONTROLS DIAGRAM

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W42.00–M–861 DRAWING NUMBER
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PLOT DATE: FILEDATE
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USER: USERNAME

AIR COOLED CHILLER SCHEDULE

TAG NO.	LOCATION/ SERVICE	MANUFACTURER/ MODEL NO.	OPT. AMB. TEMP DB (°F)	MIN. CAPACITY (TONS)	MIN. EER	MIN. NPLV	MIN. IPLV	EVAPORATOR							COMPRESSOR							CONDENSER FANS			ELECTRICAL					OPT. WEIGHT (LBS)	NOTES
								EWT (°F)	LWT (°F)	DESIGN FLOW (GPM)	MINIMUM FLOW (GPM)	△P (FT)	NO. OF PASS	FOULING FACTOR	COMP POWER (KW)	TYPE	QTY.	VFD	REF.	NO. OF REFRIG CIRCUITS	REFRIG CHARGE/ CIRCUITS (LBS)	QTY.	FAN POWER (KW)	AIRFLOW (CFM)	MCA	RLA COMP A	RLA COMP B	MOP	V/Ø/Hz		
W-42-CHW-CHU-001	ROOF/ BUILDING CHILLED WATER SYSTEM	DAIKIN AWV 012	91	200	10.31	18.8	19.62	59	44	318.3	148	8.5	2	.0001		SCREW	2	YES	R-134a	2	281	12			375	147	150	500	460/3/60	15,208	ALL

NOTES:
1. PROVIDE CHILLER WITH BACNET COMMUNICATION INTERFACE.
2. PROVIDE CHILLER WITH E-COATED CONDENSER COIL.
3. PROVIDE CHILLER WITH HIGH EFFICIENCY ECM VARIABLE SPEED DRIVEN CONDENSER FANS.
4. PROVIDE CHILLER WITH 65,000 AMPS SHORT CIRCUIT RATING.
5. PROVIDE CHILLER WITH VFD DRIVEN COMPRESSORS. CHILLER SHALL BE CAPABLE OF 5 TO 1 CAPACITY TURNDOWN.
6. INSTALL CHILLER WITH SEISMIC VIBRATION ISOLATORS ON A MIN. 11" TALL ROOF CURB.
7. PROVIDE FACTORY ACOUSTIC PANELS AROUND CHILLER BASE FULLING ENCLOSING COMPRESSOR AND EVAPORATOR
8. EXTERNAL DIMENSIONS SHALL NOT EXCEED 260" x 88"
9. ENTIRE CHILLER ASSEMBLY SHALL BE COATED BY A THIRD PARTY ANTI-CORROSION COATING. THE ANTI CORROSION COATING SHALL BE RATED TO A 10,000 HOUR SALT SPRAY RESISTANCE PER C5I AND DIN 53167.
10. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

PUMPING SYSTEM SCHEDULE

UNIT TAG	LOCATION	SERVICE	MANUFACTURER	PUMPS		OPER. WEIGHT (LBS)	NOTES
W-42-CHW-PPS-100	ROOF	CHILLED WATER	HTEC SOLUTIONS	W-42-CHW-PMP-100	W-42-CHW-PMP-200	1,500	1-10

NOTES:
1. PROVIDE SINGLE POINT POWER CONNECTION. SEE CONTROL DIAGRAM ON DRAWING.
2. CONTROL DEVICES SHALL BE WIRED BY CONTROL CONTRACTOR. SEE DRAWING.
3. NEMA 3R ENCLOSURE FOR ALL ELECTRICAL AND CONTROL PANELS.
4. PROVIDE CHECK VALVE AT ALL PUMP DISCHARGES AND SUCTION DIFFUSERS AT PUMP SUCTIONS.
5. UNIT SHALL BE COMPLETE WITH A SINGLE POINT POWER CONNECTION ELECTRICAL PANEL WHICH INCLUDES DISCONNECTS, VFDS, CONTROL POWER PROVISIONS, POWER FOR SERVICE RECEPTACLES SERVICE LIGHTING WITH SWITCH AND TIMER. FACTORY WIRED TO EQUIPMENT ON SKID.
6. PROVIDE 5 GAL CHEMICAL POT FEEDER.
7. BYPASS VALVES, ISOLATION VALVES, CONTROL VALVES SHALL BE FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
8. ALL STRUCTURAL MEMBERS SHALL BE FACTORY FINISHED PAINT STEEL CONSTRUCTION.
9. FOR PIPING MATERIAL, FITTINGS, INSULATION, AND VALVE REQUIREMENTS, SEE SPEC. FOR COMPLIANCE.
10. ALL EQUIPMENT ON PUMPING SKID SHALL BE FIELD INSULATED
11. ENTIRE CHILLER ASSEMBLY SHALL BE COATED BY A THIRD PARTY ANTI-CORROSION COATING. THE ANTI CORROSION COATING SHALL BE RATED TO A 10,000 HOUR SALT SPRAY RESISTANCE PER C5I AND DIN 53167.
12. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

VARIABLE FREQUENCY DRIVE SCHEDULE

UNIT TAG	MAKE	MODEL	LOCATION	SERVICE	MOTOR SERVICE	ELECTRICAL			EXTERNAL ENCLOSURE	INTEGRAL DISCONNECT	MANUAL BYPASS	TOTAL WEIGHT	REMARKS
						MOTOR (HP)	VFD (HP)	VOLTS/Ø/HZ					
W-42-EE-VFD-001	ABB	ACH 580-ULH	ROOF	PMP-100	PUMP MOTOR	7.5	7.5	460/3/60	NEMA 4X	YES	YES		1-5
W-42-EE-VFD-002	ABB	ACH 580-ULH	ROOF	PMP-200	PUMP MOTOR	7.5	7.5	460/3/60	NEMA 4X	YES	YES		1-5
W-42-EE-VFD-003	ABB	ACH 580-ULH	ROOF	EF-013	FAN MOTOR	1.0	1.0	460/3/60	NEMA 4X	YES	YES		1-5
W-42-EE-VFD-004	ABB	ACH 580-ULH	ROOF	EF-013	FAN MOTOR	1.0	1.0	460/3/60	NEMA 4X	YES	YES		1-5

NOTES:
1. ULTRA LOW HARMONICS DRIVE
2. PROVIDE 3-WAY BYPASS SELECTOR SWITCH.
3. INTEGRAL DISCONNECT CONSISTS OF A LOCKABLE DISCONNECT SWITCH W/ FAST ACTING FUSES.
4. MECHANICAL TO FURNISH AND ELECTRICAL TO INSTALL
5. PROVIDE SHAFT GROUNDING RING
6. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

EXPANSION TANK SCHEDULE

UNITS	MANUFACTURER MODEL NO.	SERVICE	APPROX SYSTEM VOLUME (GAL)	SYSTEM TEMP. RANGE		INITIAL PRESSURE AT TANK PSIG	MAX OPERATING PRESSURE		MIN VOLUME GAL.	MIN ACCEPT VOLUME GAL.	OPERATING WEIGHT LBS	LOCATION	REMARKS
				°F MIN	°F MAX		RELIEF VALVE PSIG	AT TANK PSIG					
W-42-CHW-TNK-001	ARMSTRONG 130-L	CHILLED WATER	-	43	92	12	105	95	35	35	420	ROOF	1
W-42-CHW-TNK-002	ARMSTRONG AX-20	CHILLED WATER	-	45	65	12	105	95	11	8.8	145	ROOF	1

NOTES:
1. PRECHARGED TO 12 PSI
2. HEAVY DUTY BUTYL BLADDER
3. INCLUDE AUTOMATED AIR VENT, BLOWDOWN VALVE, AND SKIM VALVE.
4. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

FLOW METER SCHEDULE

UNIT NO.	MAX DESIGN CAPACITY	FLOWMETER SIZE - Ø	APPLICATION	MANUFACTURER AND MODEL NO.	ELECTRICAL	STRAIGHT PIPE REQUIREMENTS		REMARKS
	GPM					UPSTREAM	DOWNSTREAM	
W-42-CHW-FE-100	320	4"Ø	CHWS	ROSEMOUNT 8705	24V BY CONTROLS	10 x PIPE DIA.	5 x PIPE DIA.	ALL

NOTES:
1. MAGNETIC TYPE
2. FLANGED CONNECTION
3. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

EXHAUST FAN SCHEDULE

UNIT NO.	LOCATION	SERVICE	FAN				MOTOR DATA					WT. (LBS.)	MANUFACTURER/ FAN MODEL NO.	NOTES
			CFM	TOTAL S.P. (IN. W.C.)	RPM	WHEEL DIA.	BHP	POWER	(NO) VFD	V/PH	RPM			
W-42-HVS-FEF-013	ROOF	FH-21	1,000	1.5	1583	16	0.81	1 HP	1	115/60/1	1725	232	GREENHECK BCSW-FRP-10	ALL
W-42-HVS-EF-013	ROOF	CANOPY HOOD EXHAUST	1,000	1.5	1583	16	0.81	1 HP	1	460/60/3	1725	232	GREENHECK BCSW-FRP-10	ALL

NOTES:
1. FIBER GLASS REINFORCED PLASTIC (FRP) CONSTRUCTION
2. BAU CONFIGURATION
3. UNIT SHALL BE VIBRATION ISOLATED
4. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

PUMP SCHEDULE

UNIT TAG	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	GPM	TOTAL FT. HEAD	PUMP % EFF.	BHP	MOTOR				NOTES
								HP	RPM	VOLT	PHASE	
W-42-CHW-PMP-100	ARMSTRONG 4030 4X3X10	ROOF	CH1	200	85	74%	5.8	7.5	1,750	460	3	ALL
W-42-CHW-PMP-200	ARMSTRONG 4030 4X3X10	ROOF	CH1	200	85	74%	5.8	7.5	1,750	460	3	ALL

NOTES:
1. VFD DRIVEN
2. TEFC MOTOR
3. PROVIDE SHAFT GROUNDING RING
4. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

AIR SEPARATOR SCHEDULE

UNIT NO.	MANUFACTURER MODEL NO.	FLOW RATE GPM	MINIMUM AIR REMOVAL %	PRESSURE DROP FT. WATER	LOCATION	SERVICE	PIPE CONNECTION (IN)	OPER. WEIGHT	NOTES
W-42-CHW-SEP-001	ARMSTRONG DAS-6	320	90%	0.8	ROOF - CHWP SKID	CHILLED WATER	6"	255	1,2,3
W-42-CHW-SEP-002	BELL AND GOSSETT IAS 1-1/2	15	90%	0.8	ROOF - PROCESS CHILLER	CHILLED WATER	1-1/2"	-	4

NOTES:
1. COMBINATION AIR AND DIRT SEPARATOR
2. STAINLESS STEEL COALESCING MEDIA.
3. INCLUDE AUTOMATED AIR VENT, BLOWDOWN VALVE, AND SKIM VALVE.
4. INLINE CONFIGURATION
5. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

PROCESS CHILLER SCHEDULE

UNIT NO.	LOCATION/ SERVICE	MFG/ MODEL NO.	OPERATING CONDITIONS (DB/WB)	CAPACITY (BTU/HR)	COMPRESSOR			ELECTRICAL		INTERNAL PUMP		TANK CAPACITY (GAL)	OPERATING WEIGHT (LBS)	NOTES
					QUANTITY	TYPE	REFRIGERANT	VOLTS/Ø/HZ	FLA	FLOW (GPM)	PRESSURE (PSI)			
W-42-CHW-CHU-002	ROOF/ RECIRCULATED COLD WATER SYSTEM	DIMPLEX SVI-5000-M	91/66	60,000	1	SCROLL	R-407C	460/3/60	16.2	15	45	36	1405	ALL

NOTES:
1. OUTDOOR LOCATED
2. UNIT SHALL BE VIBRATION ISOLATED
3. ENTIRE CHILLER ASSEMBLY SHALL BE COATED BY A THIRD PARTY ANTI-CORROSION COATING. THE ANTI CORROSION COATING SHALL BE RATED TO A 10,000 HOUR SALT SPRAY RESISTANCE PER C5I AND DIN 53167.
4. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

CHEMICAL POT FEEDER SCHEDUILE

UNIT NO.	TANK VOLUME (GAL)	MANUFACTURER AND MODEL NO	REMARKS
W-42-CHW-FDR-001	5	WESSELS SS-CPFTA-5	ALL
W-42-CHW-FDR-002	5	WESSELS SS-CPFTA-5	ALL

NOTES:
1. NPT CONNECTION
2. DESIGN BASED ON LISTED MANUFACTURER/MODEL NO. REFER TO PROJECT SPECIFICATIONS FOR LIST OF ACCEPTABLE MANUFACTURERS.

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-MCH-E

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 1 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

A. GENERAL INFORMATION

01	Project Location (city)	Oakland	04	Total Conditioned Floor Area	1
02	Climate Zone	3	05	Total Unconditioned Floor Area	40,000
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

- [x] Office (B)
- [ ] Retail (M)
- [ ] Non-refrigerated Warehouse (S)
- [ ] Hotel/ Motel Guest Rooms (R-1)
- [ ] School (E)
- [ ] Healthcare Facility (I)
- [ ] High-Rise Residential (R-2/R-3)
- [ ] Relocatable Class Bldg (E)
- [x] Other (Write In): Laboratory

[1] *FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html*

B. PROJECT SCOPE

Table Instructions: Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

My project consists of (check all that apply)

01 Air System(s)	02 Wet System Components	03 Dry System Components
[ ] Heating Air System	[ ] Water Economizer	[ ] Air Economizer
[ ] Cooling Air System	[ ] Pumps	[ ] Electric Resistance Heat
Mechanical Controls	[ ] Hydronic System Piping	[ ] Fan Systems
[ ] Mechanical Controls (existing to remain, altered or new)	[ ] Cooling Towers	[ ] Ductwork (existing to remain, altered or new)
	[x] Chillers	[ ] Ventilation
	[ ] Boilers	[ ] Zonal Systems/ Terminal Boxes

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

01 System Summary §110.1, §110.2, §140.4	AND	02 Pumps §140.4(k)	AND	03 Fans/ Economizers §140.4(c), §140.4(e)	AND	04 System Controls §110.2, §120.2, §140.4(f)	AND	05 Ventilation §120.1	AND	06 Terminal Box Controls §140.4(d)	AND	07 Distribution §120.3, §140.4(l)	AND	08 Cooling Towers §110.2(e)2	09 Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
Yes	AND		AND		AND		AND		AND		AND		AND		COMPLIES
														Mandatory Measures Compliance (See Table Q for Details)	COMPLIES

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-MCH-E

Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 2 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

Selections made in Table O have been changed by the permit applicant. See Table E. Additional Remarks for permit applicant's explanation.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Table Instructions: Complete the following equipment schedules to show compliance with mandatory requirements found in §110.1 and §110.2(a) and prescriptive requirements found in §140.4(a), §140.4(b) and §140.4(k) or §141.0(b)2 for alterations.

Chiller Efficiency and Controls

01	02	03	04	05	06	07	08	09	10
								Controls per §140.4(k)	
Name or Item Tag	Equipment Type	Qty	Size Category[1] (Tons)	Chiller Efficiency "Path B" Exception per §140.4(i)	Rated Efficiencies	Efficiencies Required per §110.2[2]	Efficiency Unit	Isolation Valve	Temperature Reset
W42-CHW-1	Air Cooled: Condenser elec. operated	1	≥ 150 and < 300	No exception taken	10.21	9.7	EER	NA: only 1 chiller in plant	Yes
					19.62	16.1	IPLV		

[1] *FOOTNOTES: Chilled water plants shall not have more than 300 tons provided by air-cooled chillers. Exceptions may apply per §140.4(j).*
[2] *Efficiency required is a minimum when "EER" or "COP" is the Efficiency Unit in column 08. It is also a minimum when "IPLV" is the unit for air-cooled, absorption, and water cooled gas engine chillers. Efficiency required is a maximum when "kW/ton" is the Efficiency Unit and when "IPLV" is the unit for water cooled electrically operated chillers.*

G. PUMPS

This Section Does Not Apply

H. FAN SYSTEMS & AIR ECONOMIZERS

This Section Does Not Apply

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-MCH-E

Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 3 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

I. SYSTEM CONTROLS

This Section Does Not Apply

J. VENTILATION AND INDOOR AIR QUALITY

This Section Does Not Apply

K. TERMINAL BOX CONTROLS

This Section Does Not Apply

L. DISTRIBUTION (DUCTWORK AND PIPING)

This Section Does Not Apply

M. COOLING TOWERS

This Section Does Not Apply

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
◉		NRCI-MCH-01-E - Must be submitted for all buildings.		☐	☐

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-MCH-E

Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 4 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
○	◉	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. *Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.*		☐	☐
○	◉	NRCA-MCH-03-A Constant Volume Single Zone HVAC *NOTE: This form does not automatically move to "Yes". If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	◉	NRCA-MCH-04-A Air Distribution Duct Leakage		☐	☐
○	◉	NRCA-MCH-05-A Air Economizer Controls		☐	☐
○	◉	NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand controlled ventilation (refer to §120.1(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints.		☐	☐
○	◉	NRCA-MCH-07-A Supply Fan Variable Flow Controls		☐	☐
○	◉	NRCA-MCH-08-A Valve Leakage Test		☐	☐
◉	○	NRCA-MCH-09-A Supply Water Temperature Reset Controls	W42-CHW-CHU-001	☐	☐
○	◉	NRCA-MCH-10-A Hydronic System Variable Flow Controls		☐	☐
○	◉	NRCA-MCH-11-A Automatic Demand Shed Controls		☐	☐

REGISTERED PROFESSIONAL ENGINEER — DAVID TAT MING PANG — M 28479 — MECHANICAL — STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

NO.	DATE	REVISION	BY	REC.	APP.
1	03FEB2021	CREATED FOR SD402	JH	GW	DP

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
PROJECT MANAGER JULIAN HO R.P.E.No. M39800
APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479
PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
EBMUD
RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
TITLE 24 FORMS SHEET 1

SHEET NO. 31

SCALE AS NOTED
DATE 03/FEB/2021
W42.00-M-882 DRAWING NUMBER
0 REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME

PLOT SCALE: PLOT$SCALE

USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$$

CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 5 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

○	●	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units		☐	☐
○	●	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance		☐	☐
○	●	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance *NOTE: This form does not automatically move to "Yes". If Distributed Energy Storage DX AC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	●	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance *NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvester, Brine, Ice-Slurry, Eutectic Salt, Clathrate Hydrate Slurry (CHS), Cryogenic or Encapulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	●	NRCA-MCH-16-A Supply Air Temperature Reset Controls		☐	☐
○	●	NRCA-MCH-17-A Condenser Water Temperature Reset Controls		☐	☐
●	○	NRCA-MCH-18 Energy Management Control Systems		☐	☐
○	●	NRCA-MCH-19 Occupancy Sensor Controls		☐	☐
○	●	NRCA-MCH-20 Multi-Family Ventilation		☐	☐
○	●	NRCA-MCH-21 Multi-Family Envelope Leakage		☐	☐

CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 6 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector	
			Pass	Fail
○	●	NRCV-MCH-04-H Duct Leakage Test *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-24 Enclosure Air Leakage Worksheet *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-27 High-rise Residential *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-32 Local Mechanical Exhaust *NOTE: Must be completed by a HERS Rater*	☐	☐

CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 7 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

Q. MANDATORY MEASURES DOCUMENTATION LOCATION

Table Instructions: Indicate where mandatory measures are documented in the plan set or construction documentation. For any mandatory measures that do not apply, mark the plan sheet or construction document location as "N/A", any active cells that are left blank will result in non-compliance in Table C.

01		02
		Plan sheet or construction document location
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block:	No	

03	04
Mandatory Measure	Plan sheet or construction document location
Heating Equipment Efficiency per §110.1	Mechanical Schedule W-42.00-M-881
Cooling Equipment Efficiency per §110.1	Mechanical Schedule W-42.00-M-881
Furnace Standby Loss Control per §110.2(d)	N/A
Duct Insulation per §120.4	N/A
Heating Hot Water Equipment Efficiency per §110.1	N/A
Cooling Chilled and Condenser Water Equipment Efficiency per §110.1	Mechanical Schedule W-42.00-M-881
Open and Closed Circuit Cooling Towers conductivity of flow-based controls per §110.2(e)1	N/A
Open and Closed Circuit Cooling Towers Flow Meter with analog output per §110.2(e)3	N/A
Open and Closed Circuit Cooling Towers Overflow Alarm per §110.2(e)4	N/A
Open and Closed Circuit Cooling Towers Efficient Drift Eliminators per §110.2(e)5	N/A
Pipe Insulation per §120.3(b)	Project Specifications
Combustion air shutoff, combustion air fan controls and stack design and controls for boilers per §120.9	N/A
Heat Pump with Supplementary Electric Resistance Heater Controls per §110.2(b)	N/A
The air duct and plenum system is designed per §120.4(a)-(f)	N/A
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2	N/A

CERTIFICATE OF COMPLIANCE			NRCC-MCH-E
Project Name:	MWWTP Admin, Lab, and Dewatering Buildings HVAC Improvements	Report Page:	Page 8 of 8
Project Address:	2020 Wake Ave, Oakland, CA	Date Prepared:	12/2/2020

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Julian Ho	Documentation Author Signature:	
Company:	Gayner Engineers	Signature Date:	12/2/2020
Address:	1133 Post Street	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	San Francisco/CA/94109	Phone:	415-474-9500

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. **The information provided on this Certificate of Compliance is true and correct.**
2. **I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)**
3. **The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.**
4. **The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.**
5. **I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.**

Responsible Designer Name:	Julian Ho	Responsible Designer Signature:	
Company :	Gayner Engineers	Date Signed:	12/2/2020
Address:	1133 Post Street	License:	M39800
City/State/Zip:	San Francisco/CA/94109	Phone:	415-474-9500

REGISTERED PROFESSIONAL ENGINEER
DAVID TAT MING PANG
M 28479
MECHANICAL
STATE OF CALIFORNIA
EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

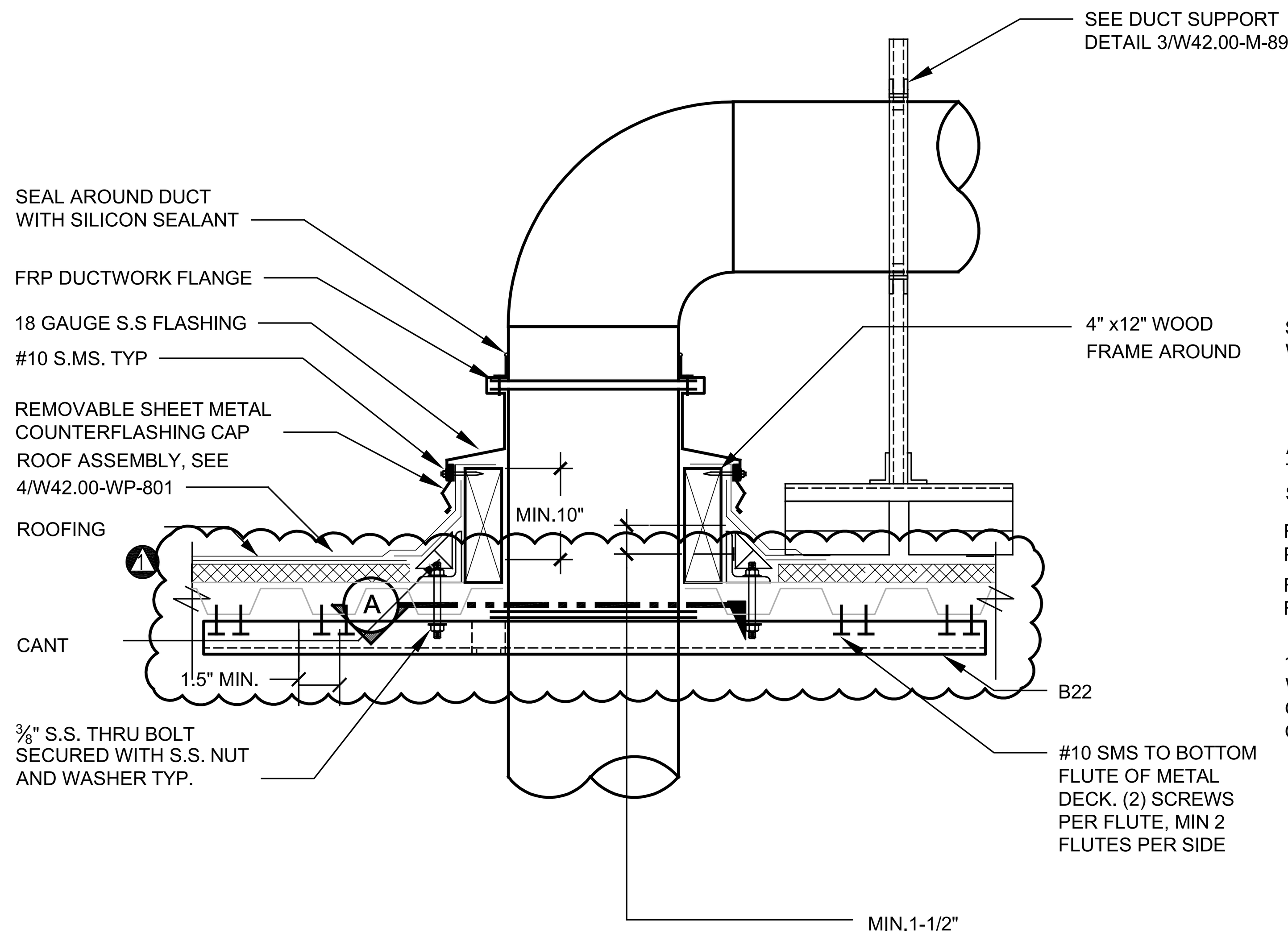
EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

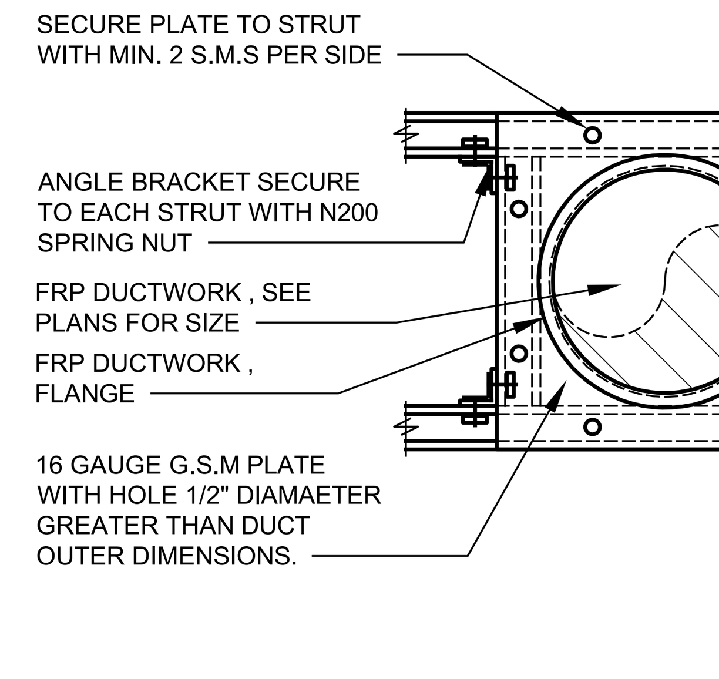
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
TITLE 24 FORMS SHEET 2

SHEET NO. 32

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–883
DRAWING NUMBER
0
REV.





SECTION A

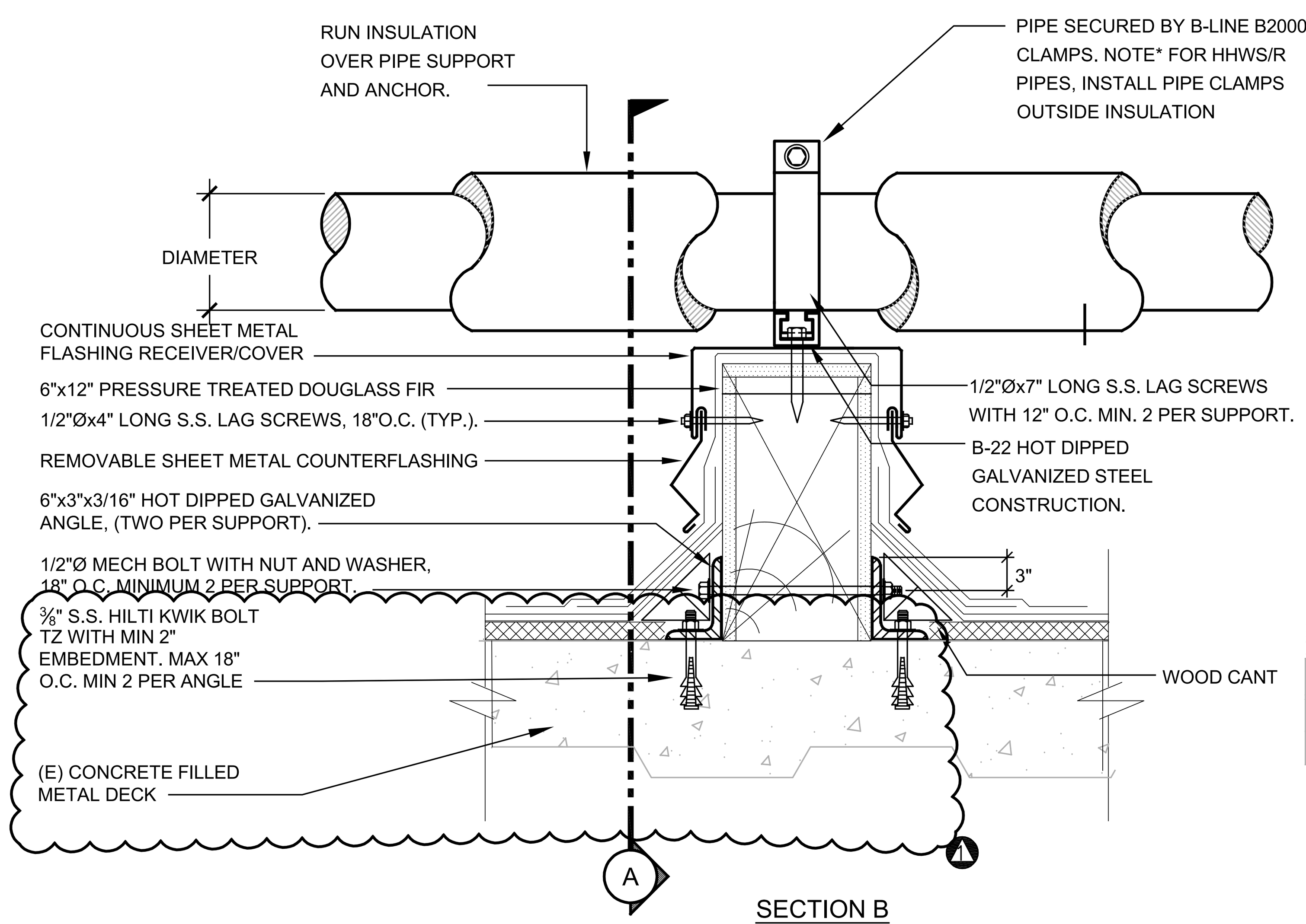
NOTE:

1. DESIGNED FOR MAX REC. DUCT SIZE OF 24"X14" (8.2 PLF)
2. DESIGNED FOR TRIB LENGTH = STORY HT. (12.5')
3. DETAIL SIMILAR FOR EXHAUST DUCT INSTALLATION

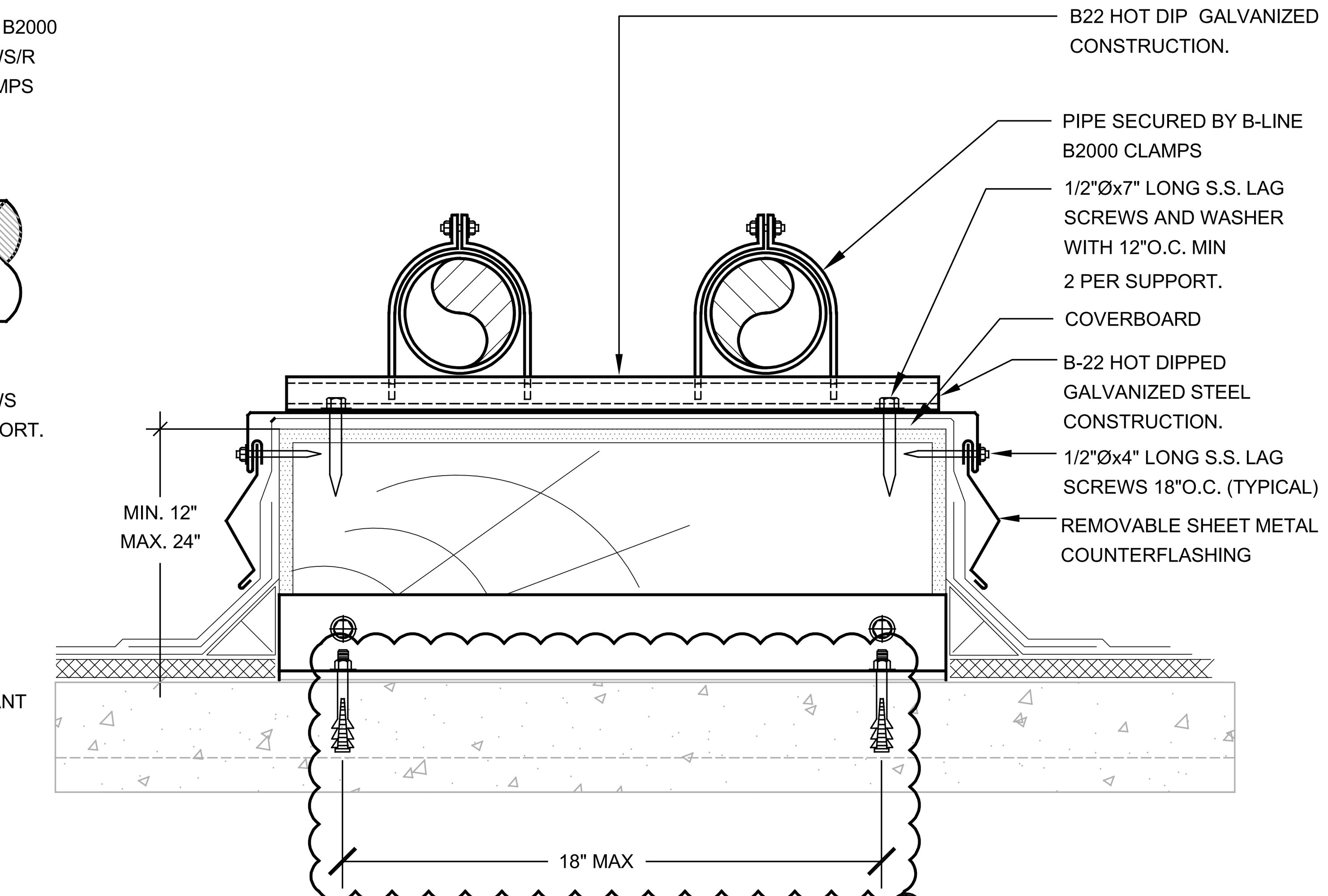
ROUND DUCT THROUGH ROOF

SCALE: NONE

2 M-804.1



SECTION B



SECTION A

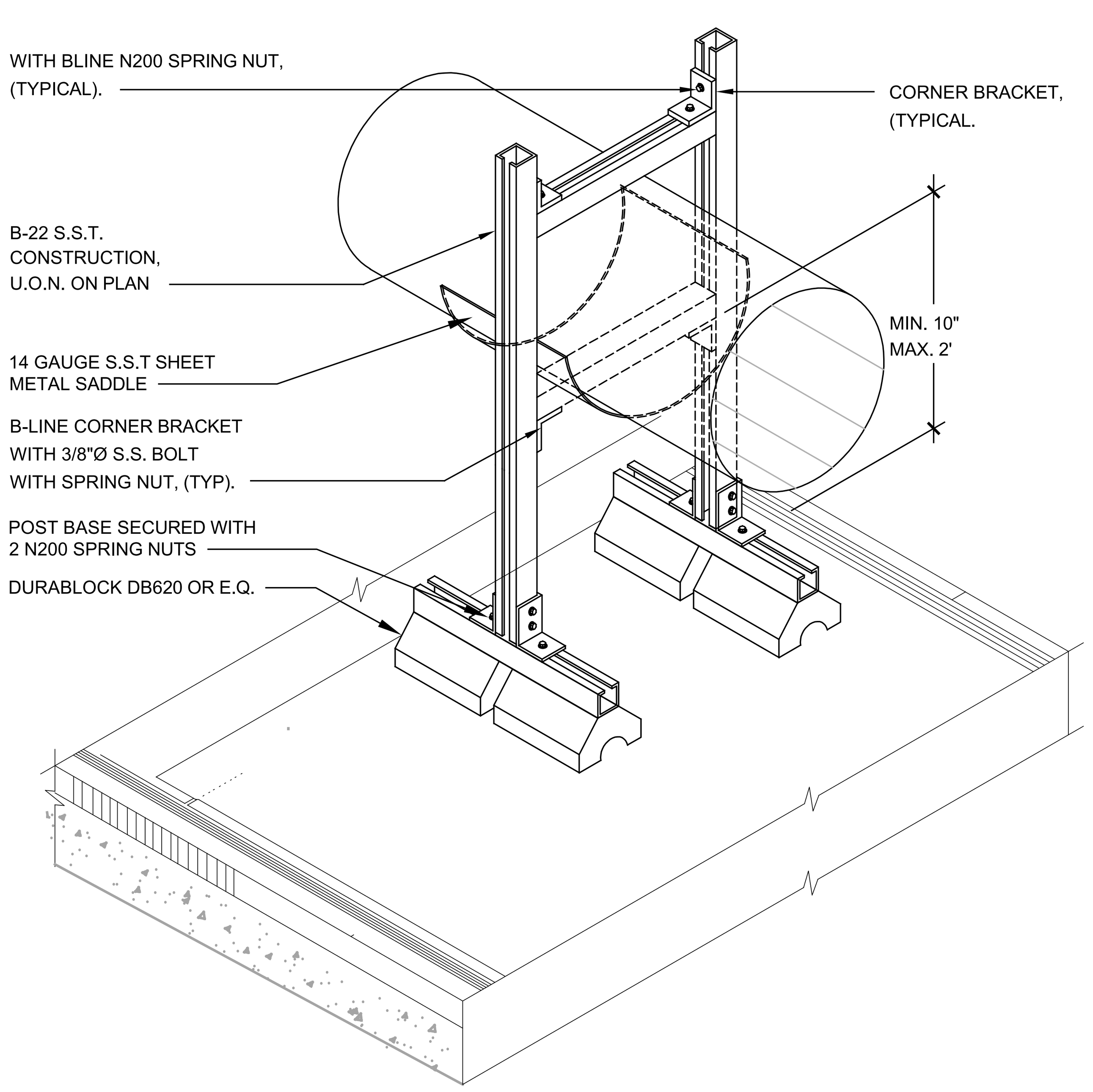
NOTES:

1. ALL STEEL MEMBERS AND COMPONENTS SHALL BE STAINLESS STEEL.
2. PIPE SUPPORT SPACING SHALL BE 10'-0" MAXIMUM.

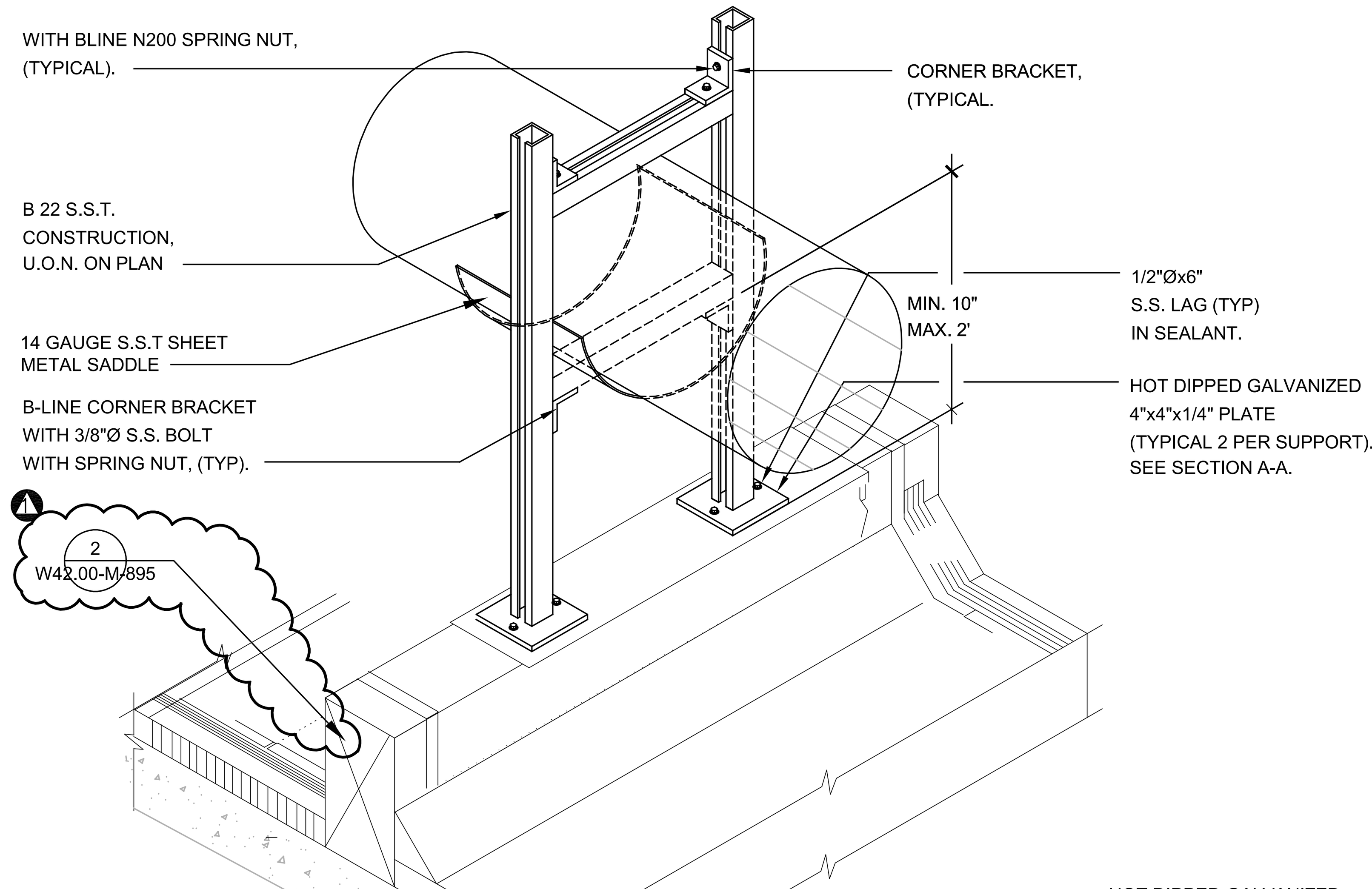
ROOF PIPE SUPPORT DETAIL

SCALE: NONE

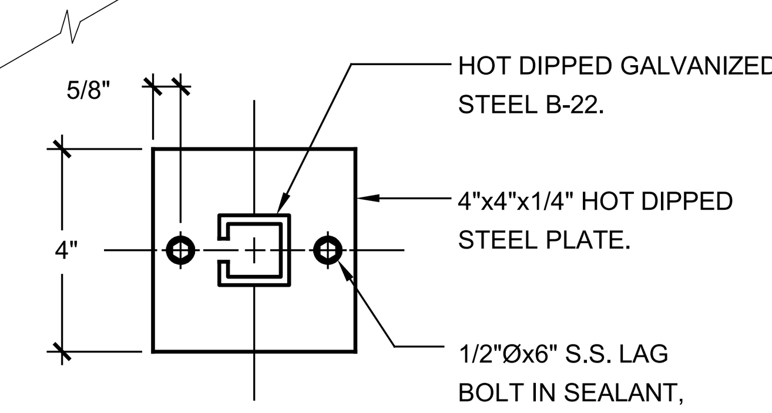
1 -



DURABLOK SUPPORT



SLEEPER SUPPORT



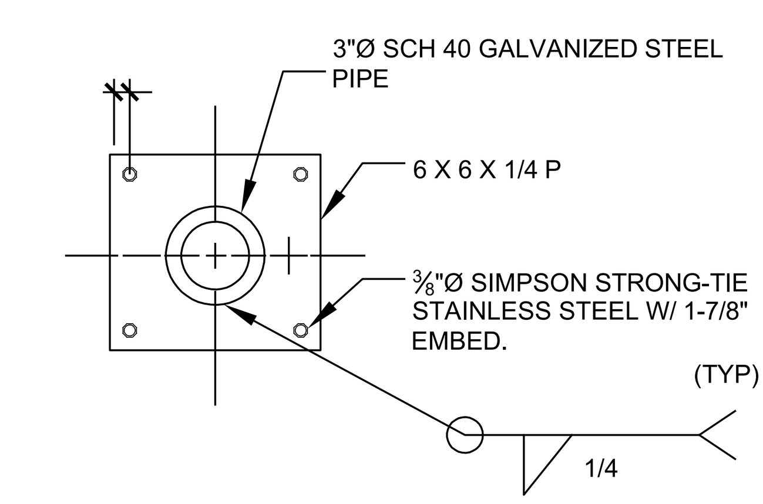
NOTES:

1. ALL STRUT MEMBERS SHALL BE CONSTRUCTED OF STAINLESS STEEL.
2. DUCTWORK SUPPORTS SHALL BE PLACED AT 5' MAX INCREMENTS AND AT EVERY CHANGE IN DIRECTION. SEE FLOOR PLANS FOR SUGGESTED LOCATIONS.
3. SEE FLOOR PLANS FOR APPLICABLE SUPPORT LOCATIONS

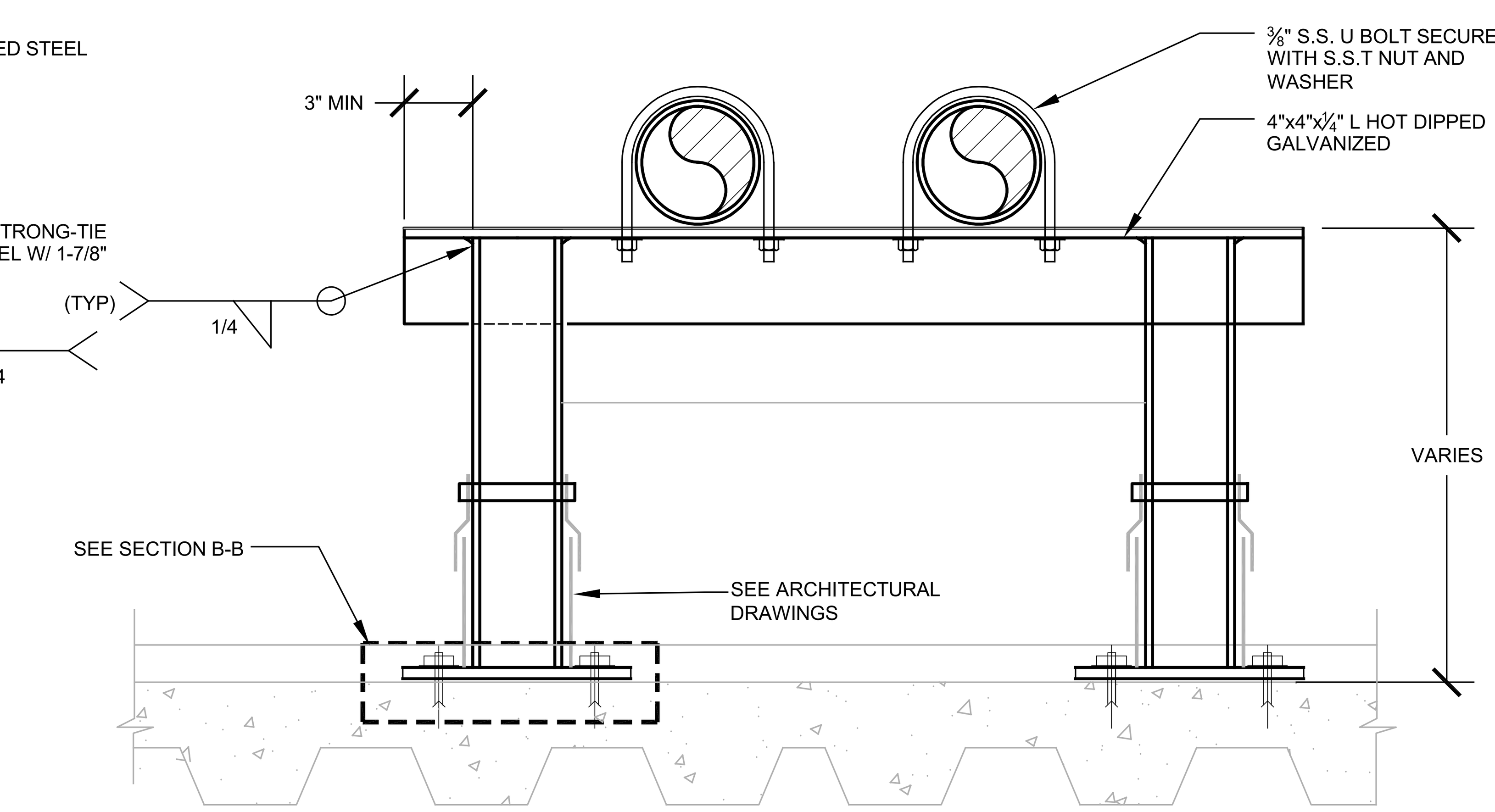
DUCT SUPPORT DETAIL

SCALE: NONE

3 M-804.1



SECTION B-B



NOTES:

1. ALL PIPE SUPPORT COMPONENTS SHALL BE HOT DIP GALVANIZED

ELEVATED PIPE SUPPORT

SCALE: NONE

4 M-804.5

REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT 0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

NO.	DATE	REVISION	BY	REC.	APP.
1	14MAY2021	ADDENDUM NO.4	JH	GW	DP
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT:
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
PROJECT MANAGER JULIAN HO R.P.E.No. M39800
APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479

EBMUD:
PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

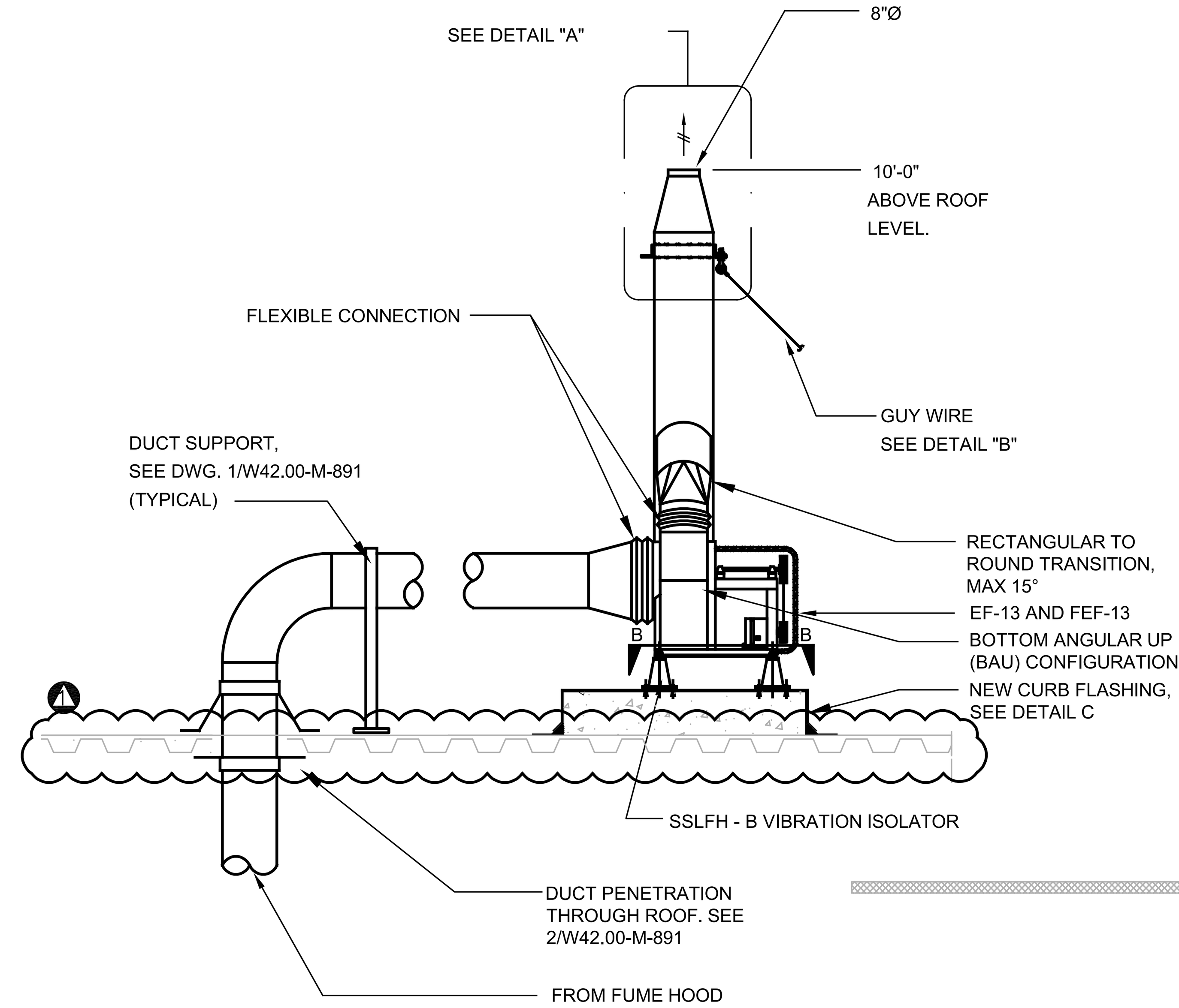
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DETAILS SHEET - 1

SHEET NO. 33

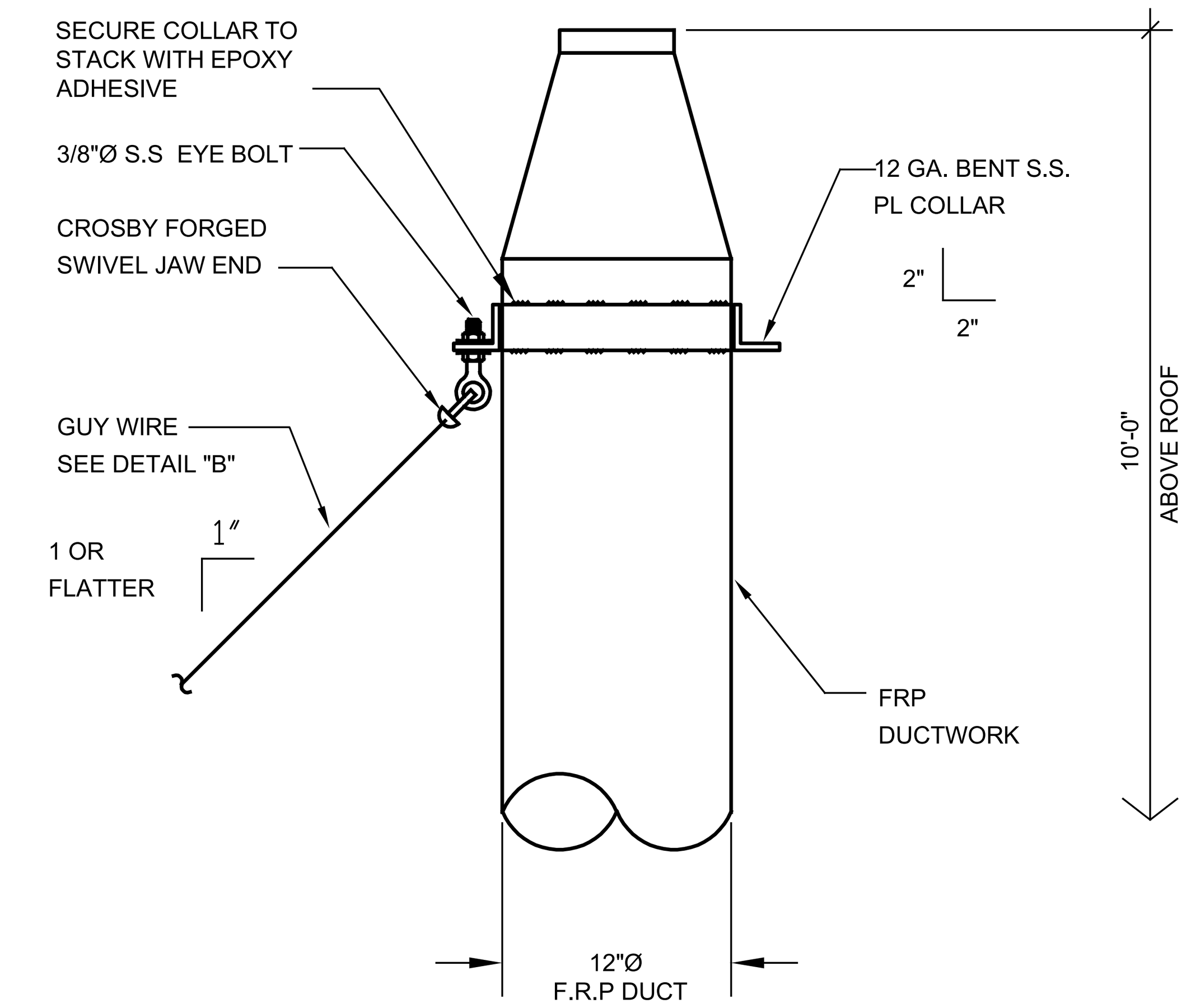
SCALE AS NOTED
DATE 03/FEB/2021
W42.00-M-891 DRAWING NUMBER
REV. 1

REF 1: REF1$FILENAME REF 2: REF2$FILENAME REF 3: REF3$FILENAME REF 4: REF4$FILENAME REF 5: REF5$FILENAME REF 6: REF6$FILENAME REF 7: REF7$FILENAME REF 8: REF8$FILENAME REF 9: REF9$FILENAME PLOT SCALE: PLOT$SCALE USER: $$USER$$$ DATE: $$$$$DATE$$$$$ FILE: $$$$$FILE$$$$



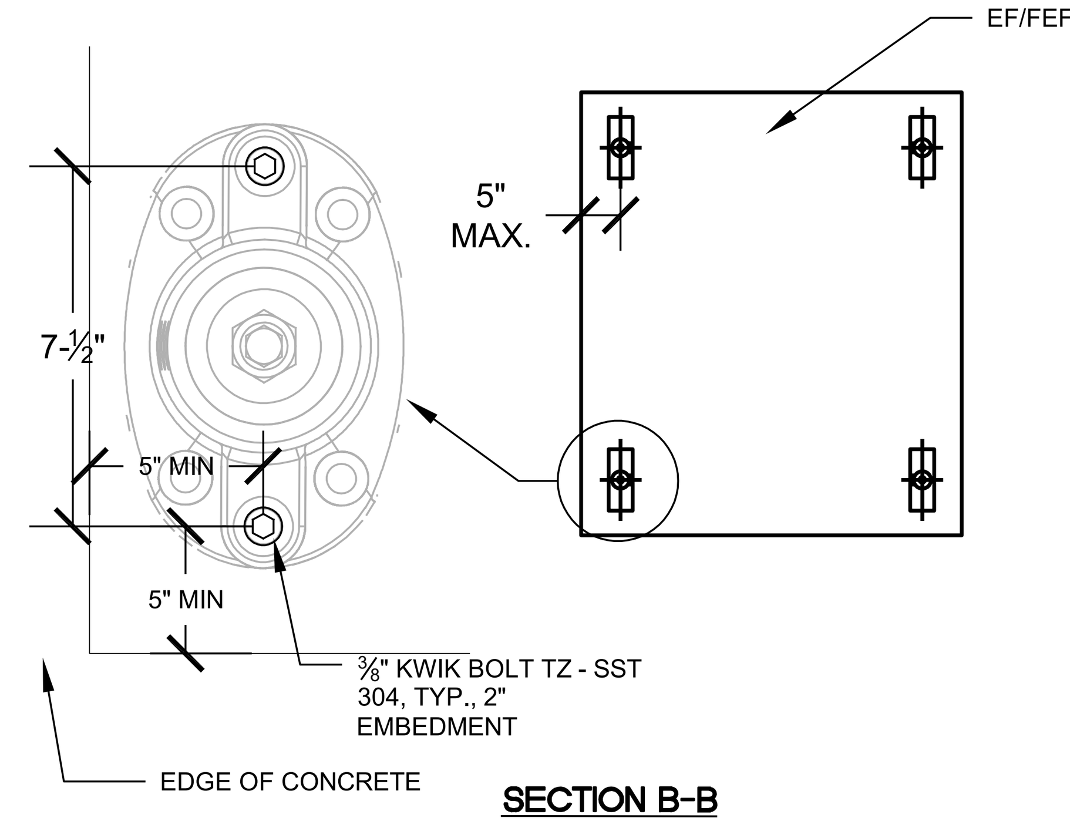
ELEVATION VIEW (1)

SCALE: NONE

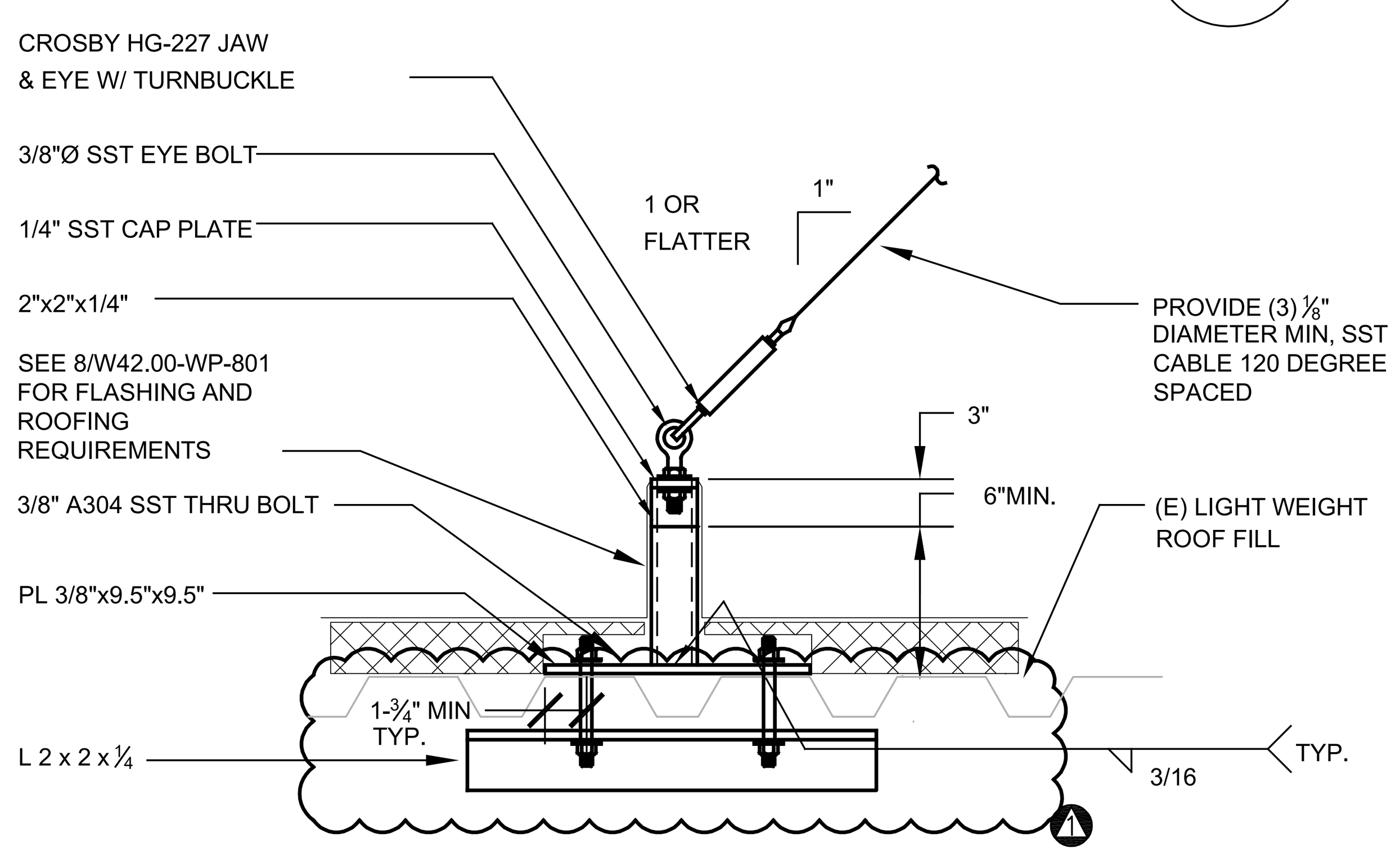


STACK SUPPORT (A)

SCALE: NONE



SECTION B-B

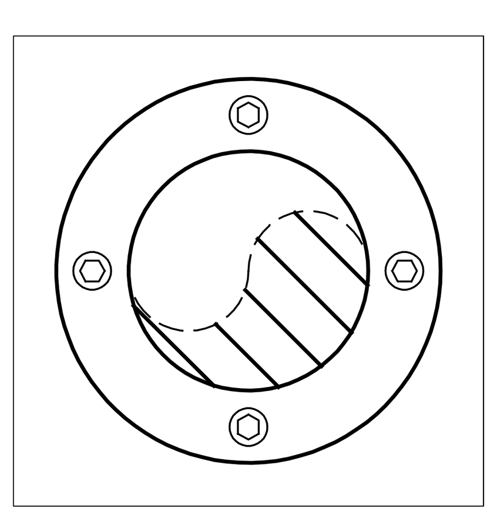


NOTE:

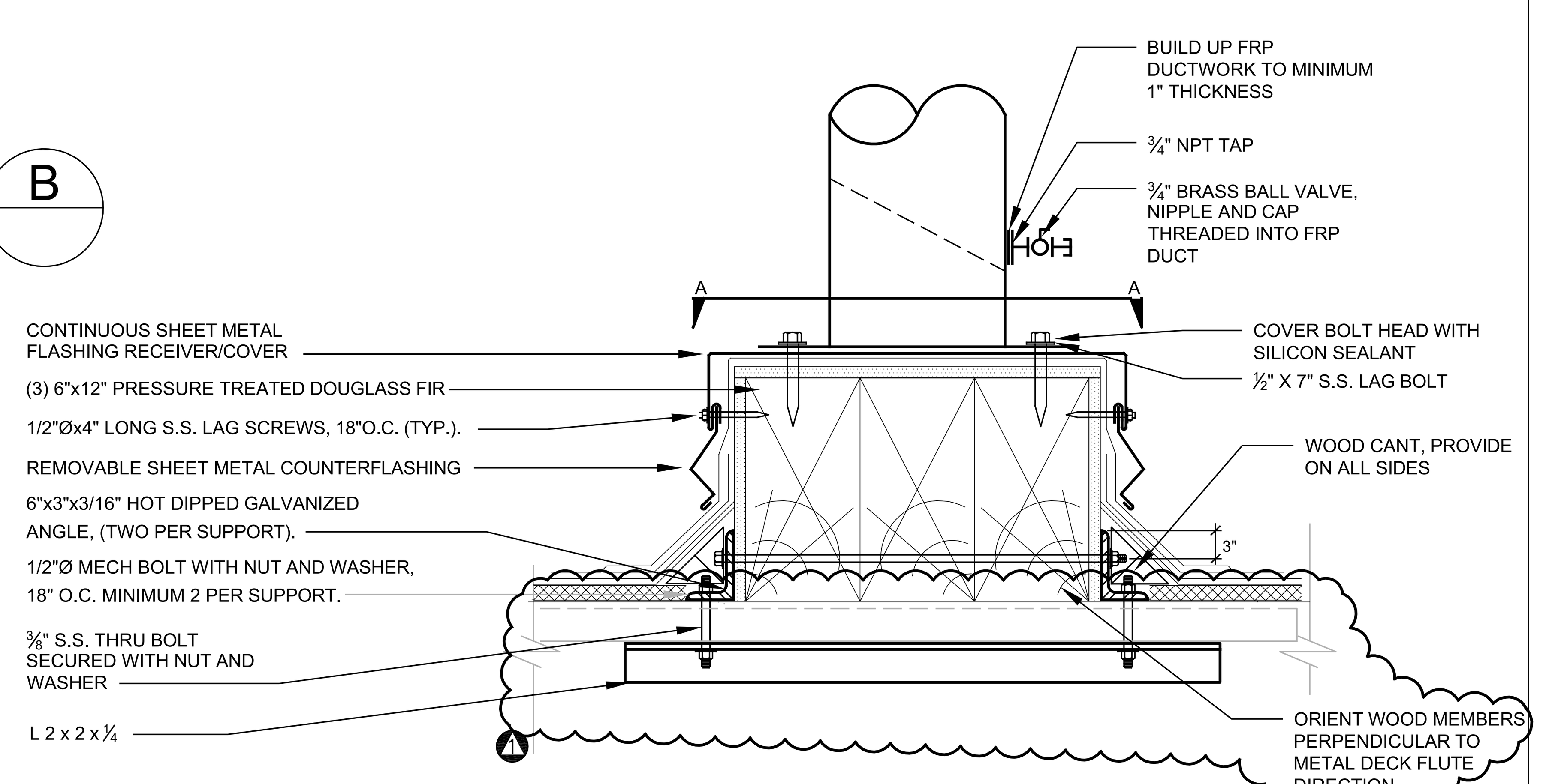
1. ALL ANCHOR BOLTS SHALL BE STAINLESS STEEL.

GUY WIRE SUPPORT (B)

SCALE: NONE



SECTION A-A



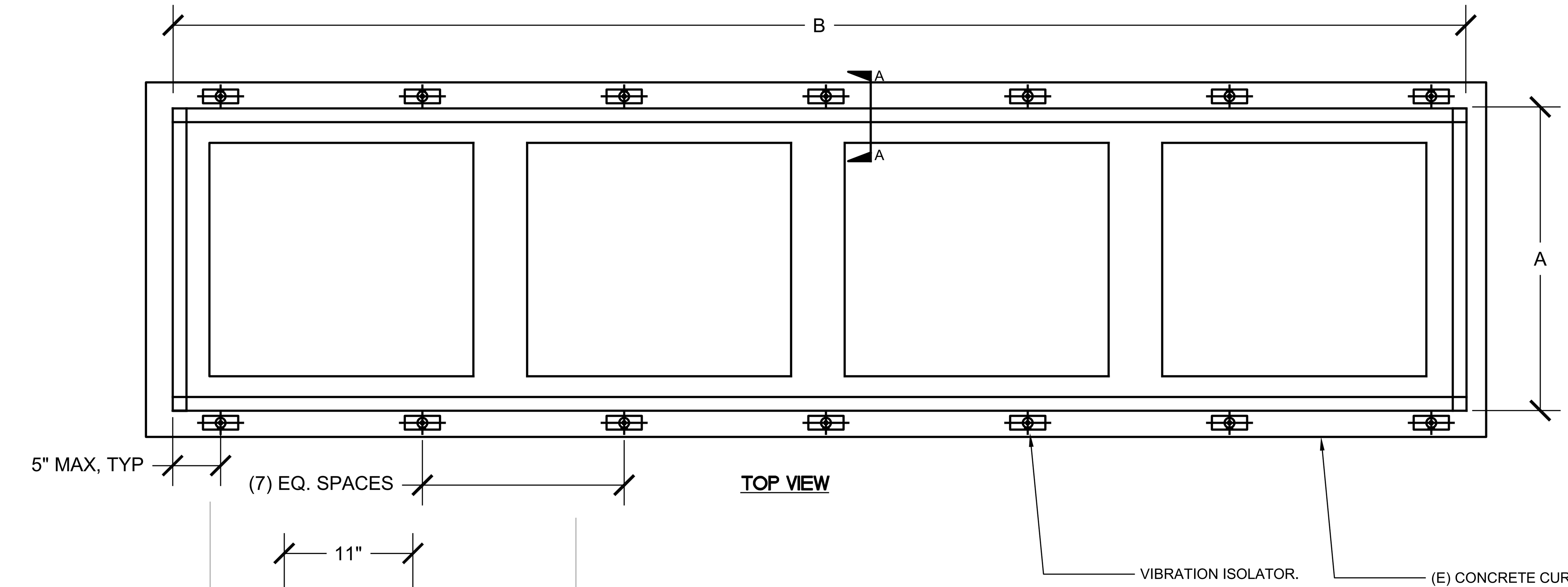
STACK BASE DETAIL (C)

SCALE: NONE

EF-13 AND FEF-13 FAN DETAIL (2 / M-804.1)

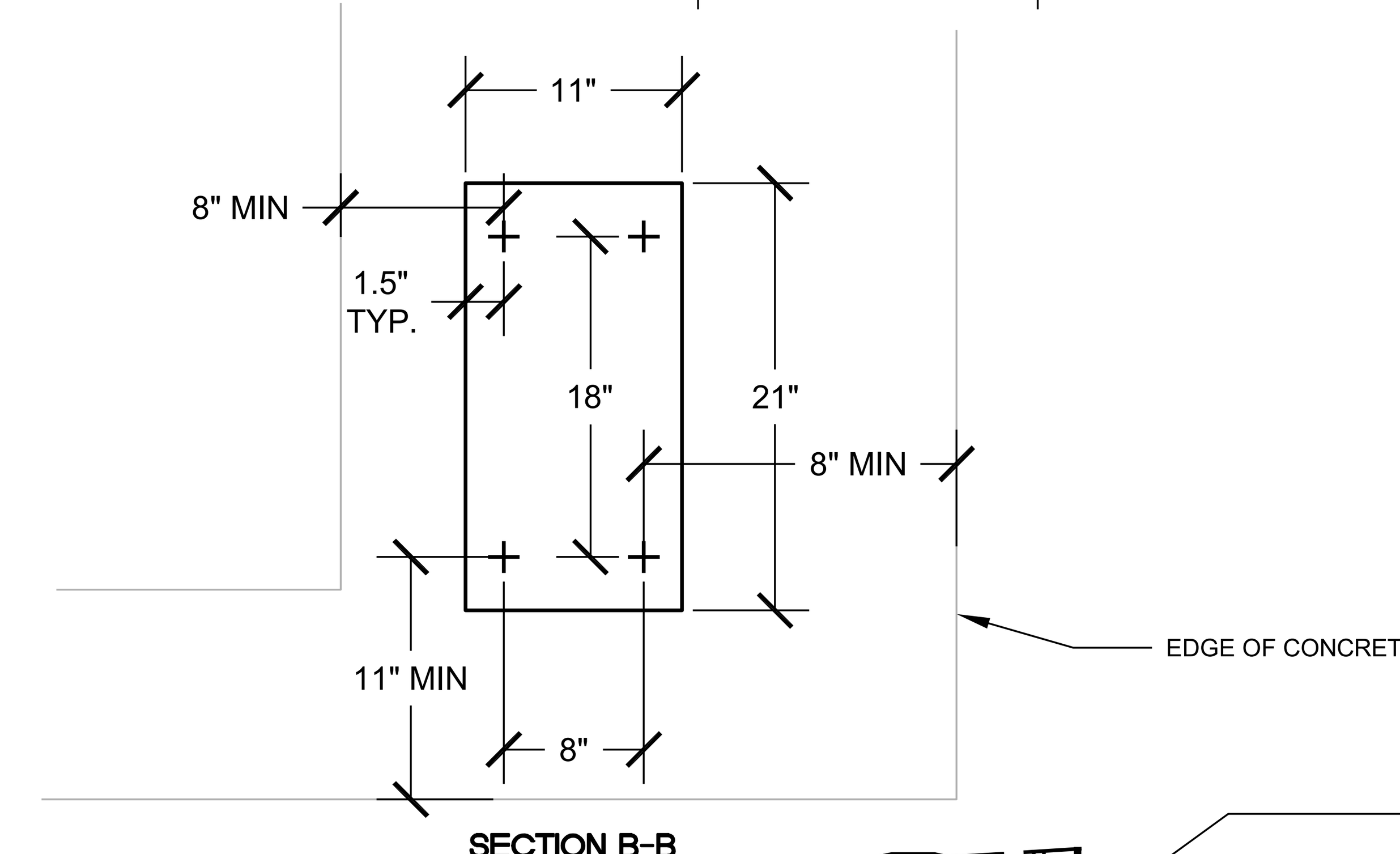
SCALE: NONE

3" ON ORIGINAL DOCUMENT 0 1 2 3

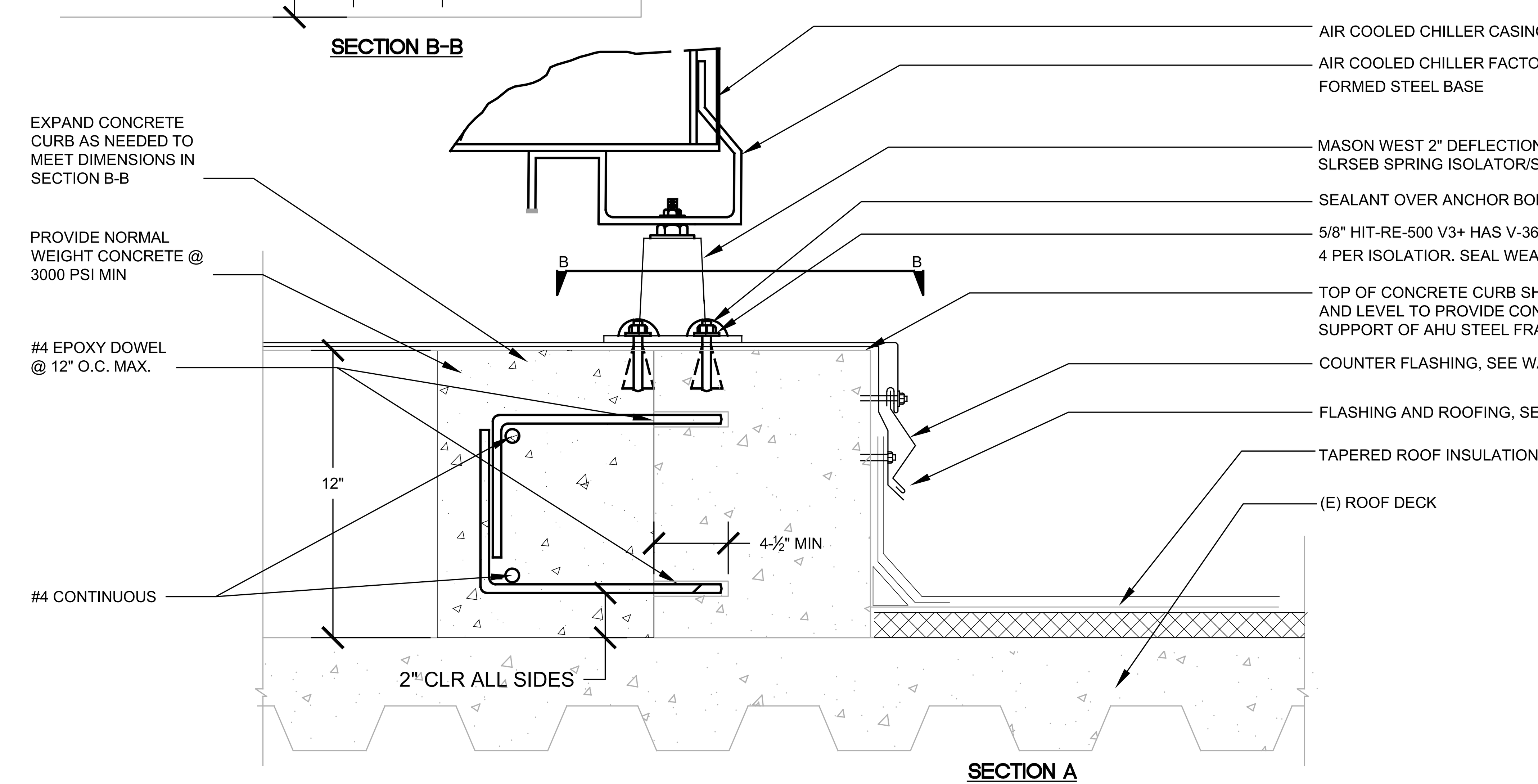


TOP VIEW

UNIT	UNIT OPT. WT. (LBS)	OVERALL DIMENSIONS (IN)		
		A (W)	B (L)	C (H)
CH-1	15,208	88	258	100



SECTION B-B



SECTION A

AIR COOLED CHILLER SUPPORT DETAIL (1 / M-804.5)

SCALE: NONE

EXP. DATE: JUNE 30, 2021

GAYNER ENGINEERS
1133 POST STREET
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NO.	DATE	REVISION	BY	REC.	APP.
1	14MAY2021	ADDENDUM NO.4	JH	GW	DP
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG
R.P.E. No. M28479
PROJECT MANAGER JULIAN HO
R.P.E.No. M39800
APPROVED: DAVID PANG
PRINCIPAL IN CHARGE
R.P.E. No. M28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED: G. WARREN
SR. ENGINEER
R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DETAILS SHEET – 2

SHEET NO. 34

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–892
DRAWING NUMBER
1
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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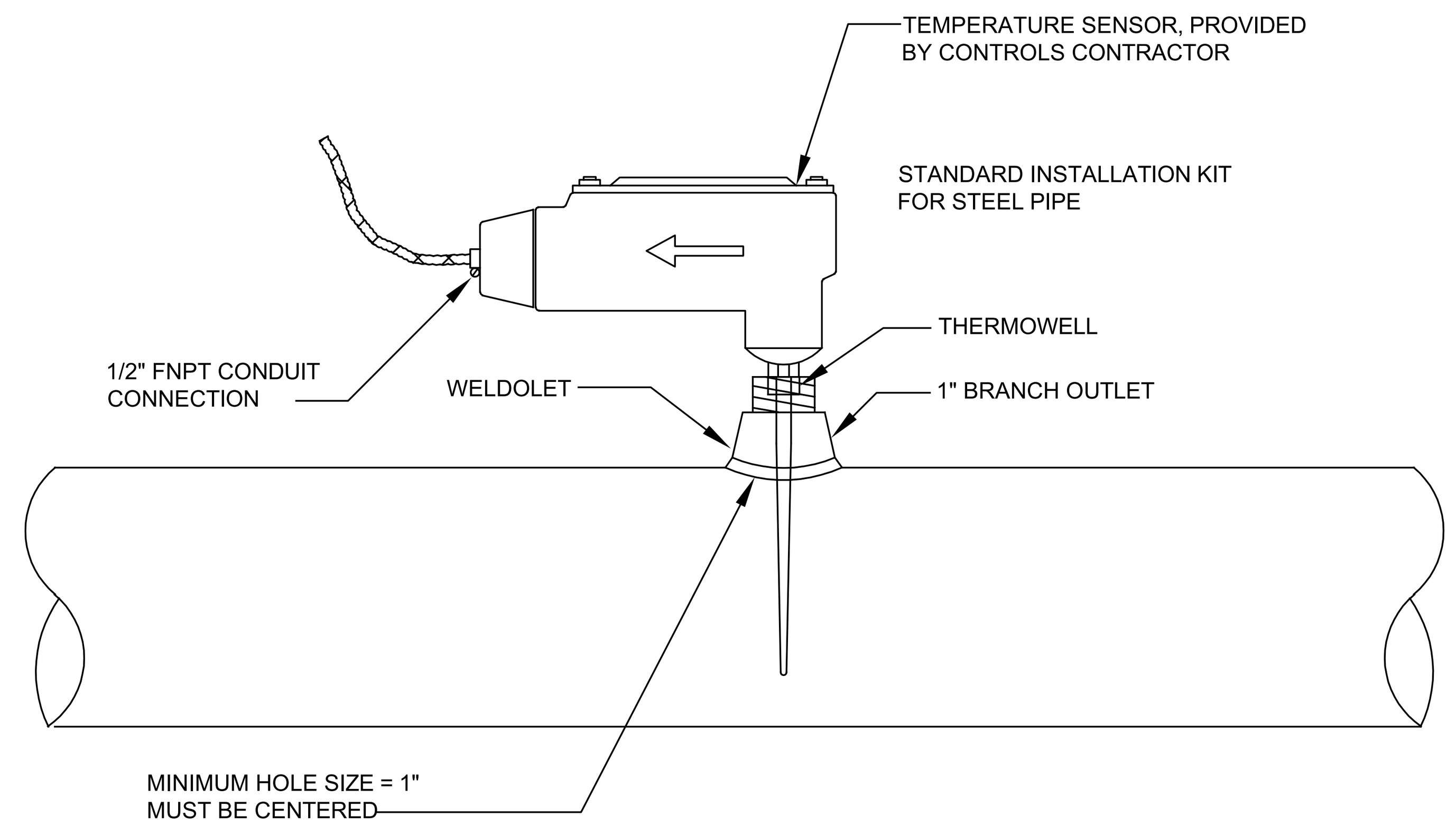

SENSOR INSTALLATION DETAIL (2 / -)

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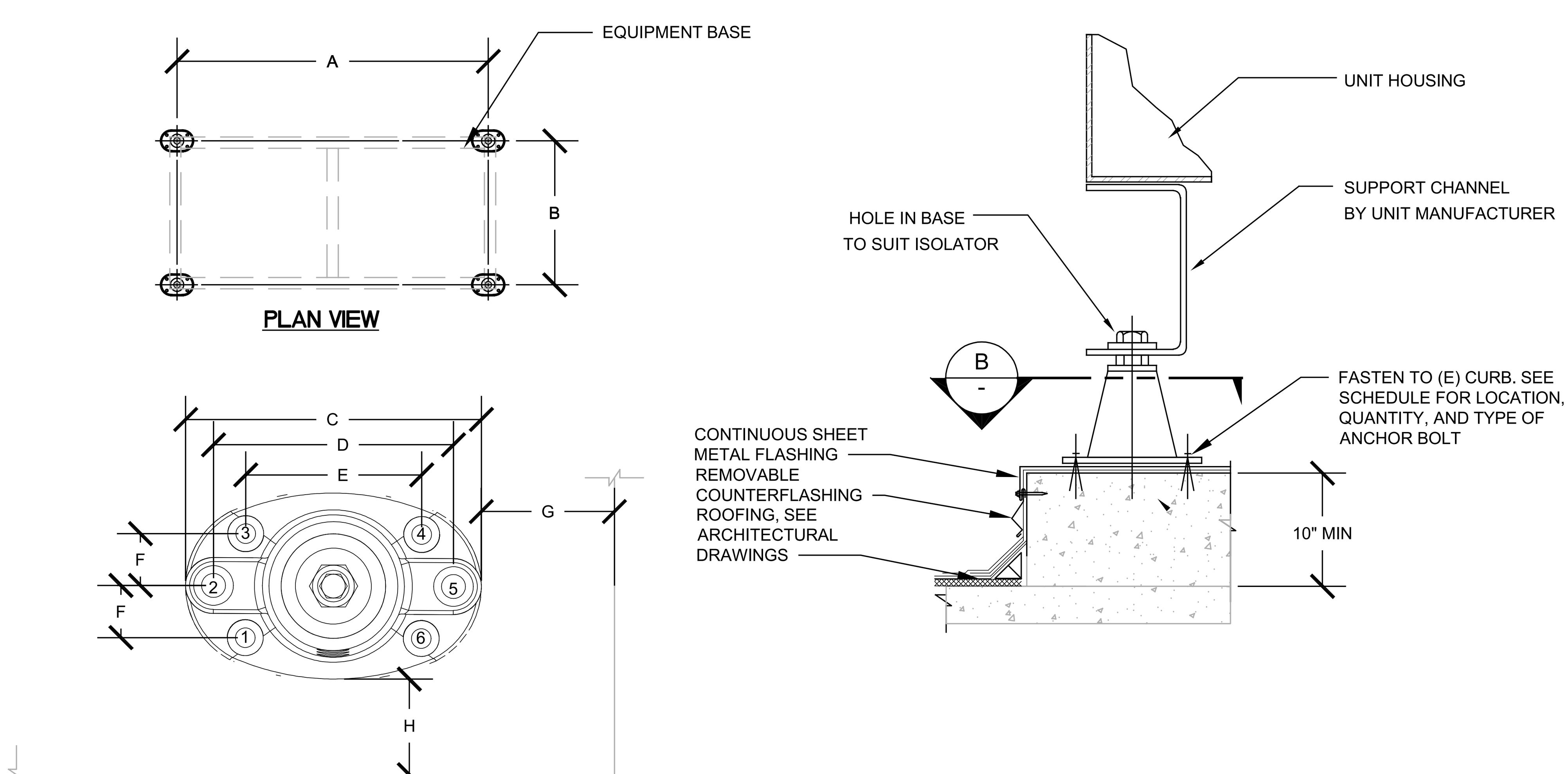
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME



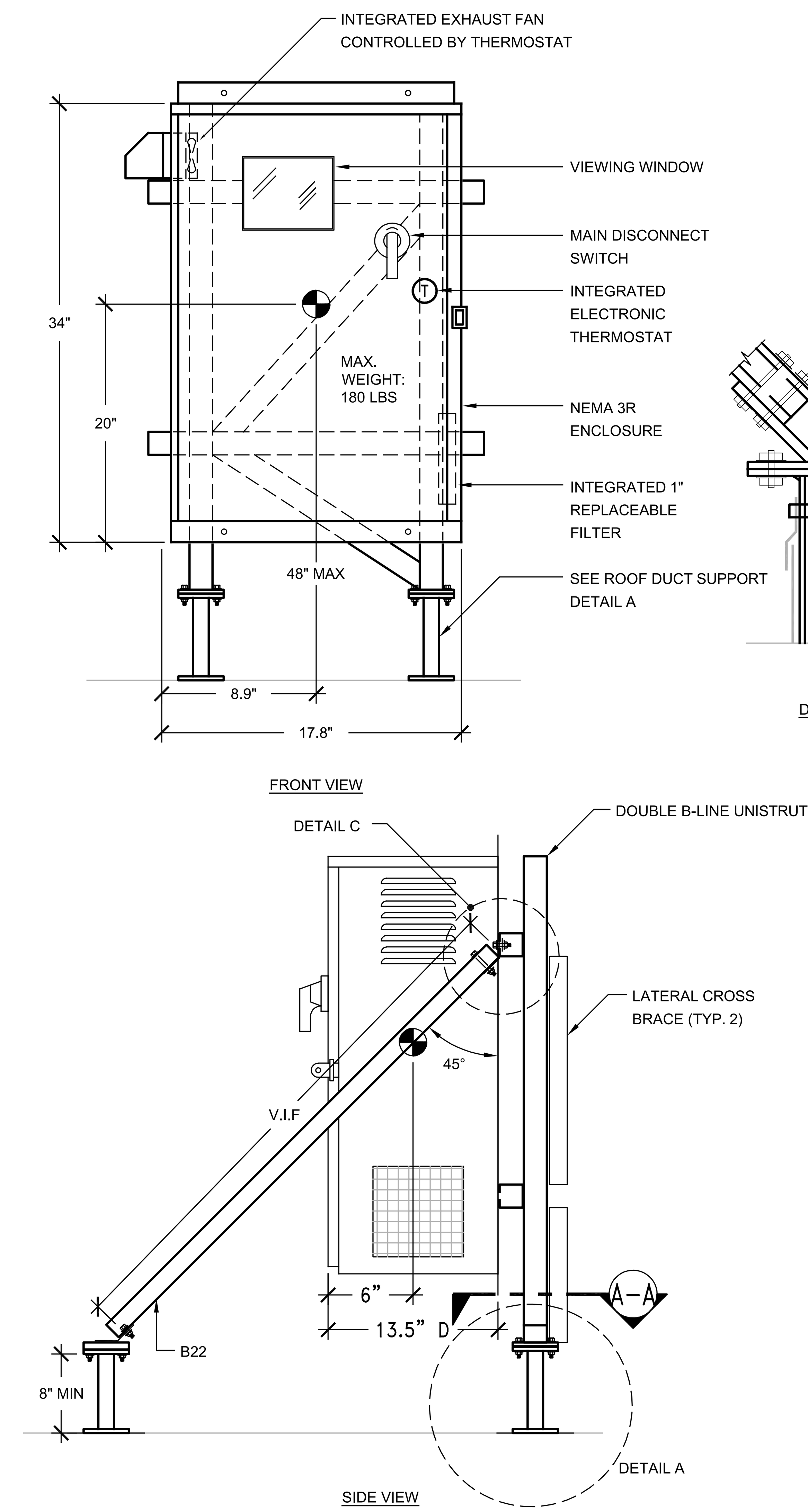
SECTION B-B

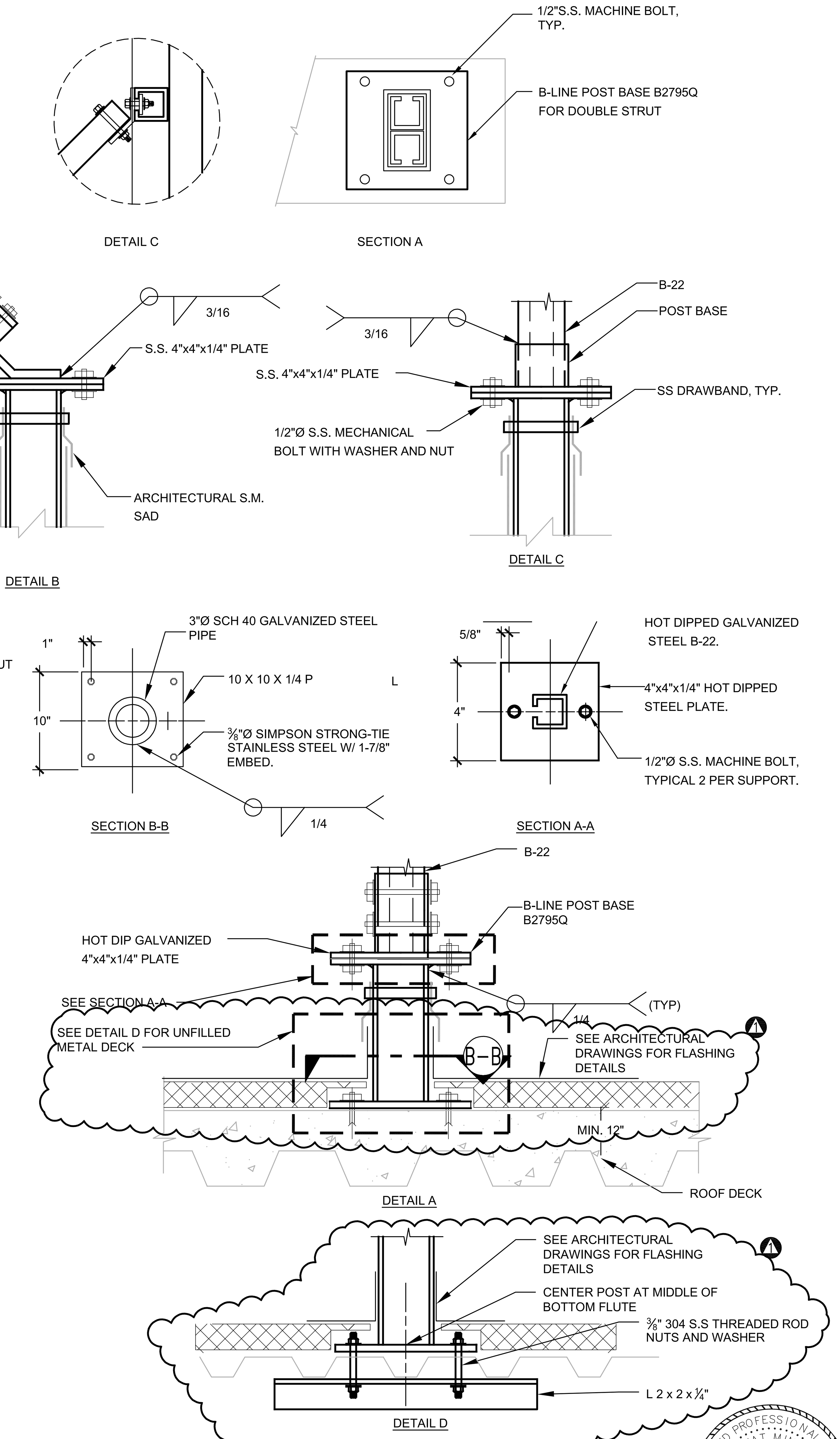
EQ NO.	EQ NO.	OP. WT.	A	B	C	D	E	F	G	H	BOLT POINTS	FASTENER TYPE / EMBEDMENT REQUIREMENTS
W-42-CHW-CHU-002	MASON WEST SSLFH-B2-290	1450	26.55"	34.38	9.25"	7-1/2"	5-1/2"	1-5/8"	12" MIN	12" MIN	#2, #5	½" HIT-RE 500 V3 + HAS-V-36 (ASTM GR.36) / 8-¼" EMBEDMENT, TYP.
W-42-CHW-PPS-001	MASON WEST SSLFH-B2-290	1500	38"	54.75"	9.25"	7-1/2"	5-1/2"	1-5/8"	12" MIN	12" MIN	#2, #5	½" HIT-RE 500 V3 + HAS-V-36 (ASTM GR 36)/ 7" EMBED. TYP.

MECH EQUIUPMENT VIBRATION ISOLATOR (3 / M-804.5)

SCALE: NONE

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME





NOTES:

1. COMPLETE BASE SUPPORT ASSEMBLY SHALL BE STAINLESS STEEL GALVANIZED AFTER FABRICATION.
2. ALL WELDS SHALL ONLY BE MADE ON STAINLESS STEEL COMPONENTS.
3. CONTRACTOR SHALL SUBMIT SUBSTITUTION REQUEST AND PROPOSED SHOP DRAWING ON ANY SUBSTITUTIONS OF DUCT SUPPORT.
4. ALL METAL UNISTRUT, BRACKETS AND FASTENERS SHALL BE GALVANIZED STEEL.
5. ROOFING AND ROOF INSULATION THICKNESS VARIES, MAINTAIN 12" FROM TOP OF ROOFING TO FLASHING AS REQUIRED BY ROOFING SYSTEM CONTRACTOR, SEE ARCHITECTURAL DRAWING.

VFD SUPPORT DETAIL (1 / M-804.5)

SCALE: NONE

REGISTERED PROFESSIONAL ENGINEER JON YUKIO YOKOYAMA S4216 Exp. 06-30-22 STRUCTURAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$

3" ON ORIGINAL DOCUMENT 0 1 2 3

GAYNER ENGINEERS
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NO.	DATE	REVISION	BY	REC.	APP.
1	14MAY2021	ADDENDUM NO.4	JH	GW	DP
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
PROJECT MANAGER JULIAN HO R.P.E.No. M39800
APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479

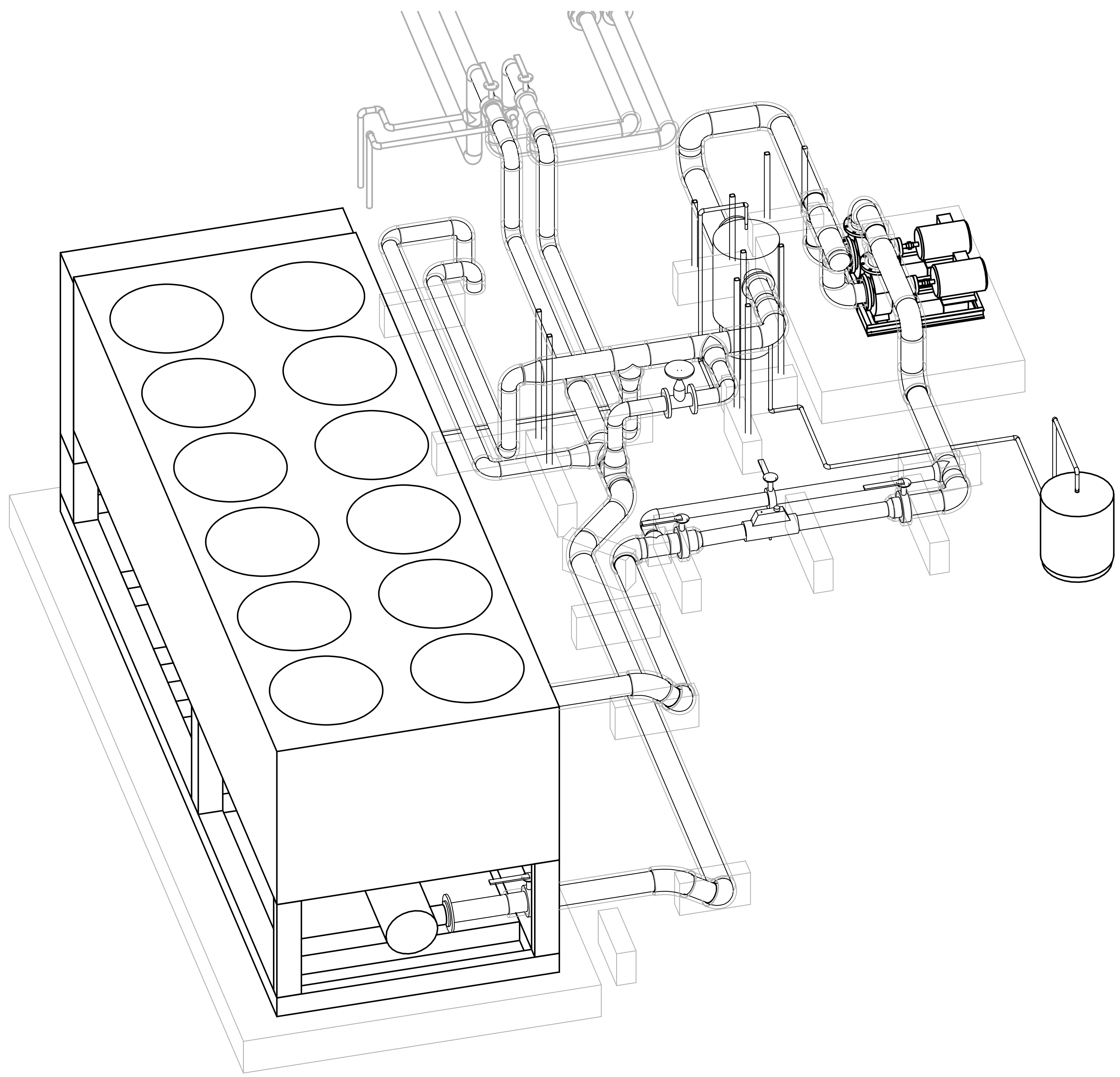
EBMUD
PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DETAILS – SHEET 3

SHEET NO. 35

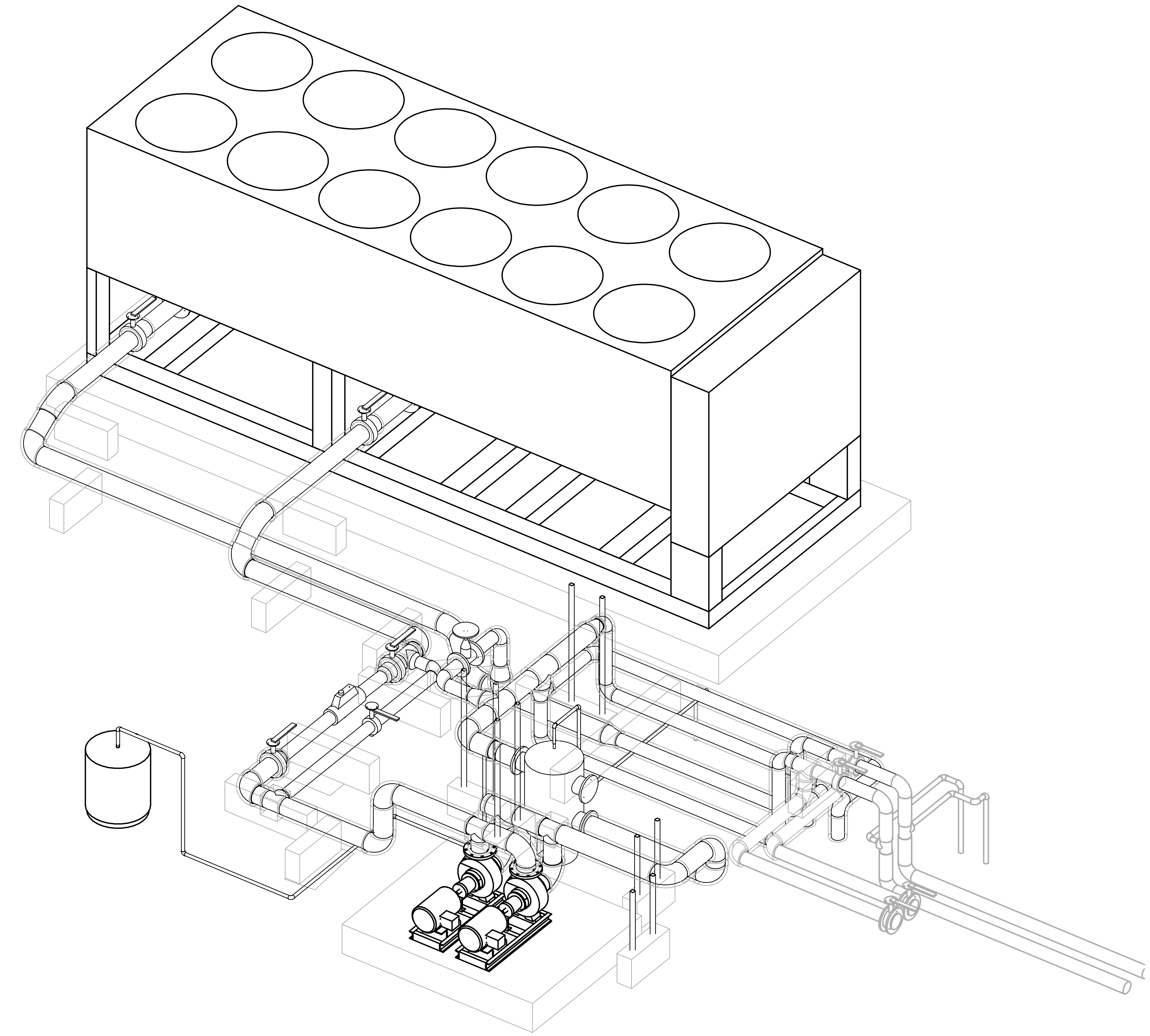
SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–893 DRAWING NUMBER
REV. 1



CHILLER YARD 3D VIEW 2

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

2
-



CHILLER YARD 3D VIEW 1

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

1
-

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REF 3: REF3$FILENAME
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USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$
PLOT SCALE: PLOT$SCALE

3" ON ORIGINAL DOCUMENT
0 1 2 3

REGISTERED PROFESSIONAL ENGINEER
DAVID TAT MING PANG
M 28479
MECHANICAL
STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

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NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	JH	GW	DP

SD402 – MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT	DESIGN BY: JH
	DRAWN BY: JH
	DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
	PROJECT MANAGER JULIAN HO R.P.E.No. M39800
	APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479
EBMUD	PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
	RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DETAILS – SHEET 4

SHEET NO. 36

SCALE	AS NOTED	DRAWING NUMBER	REV.
DATE	03/FEB/2021	W42.00–M–894	0

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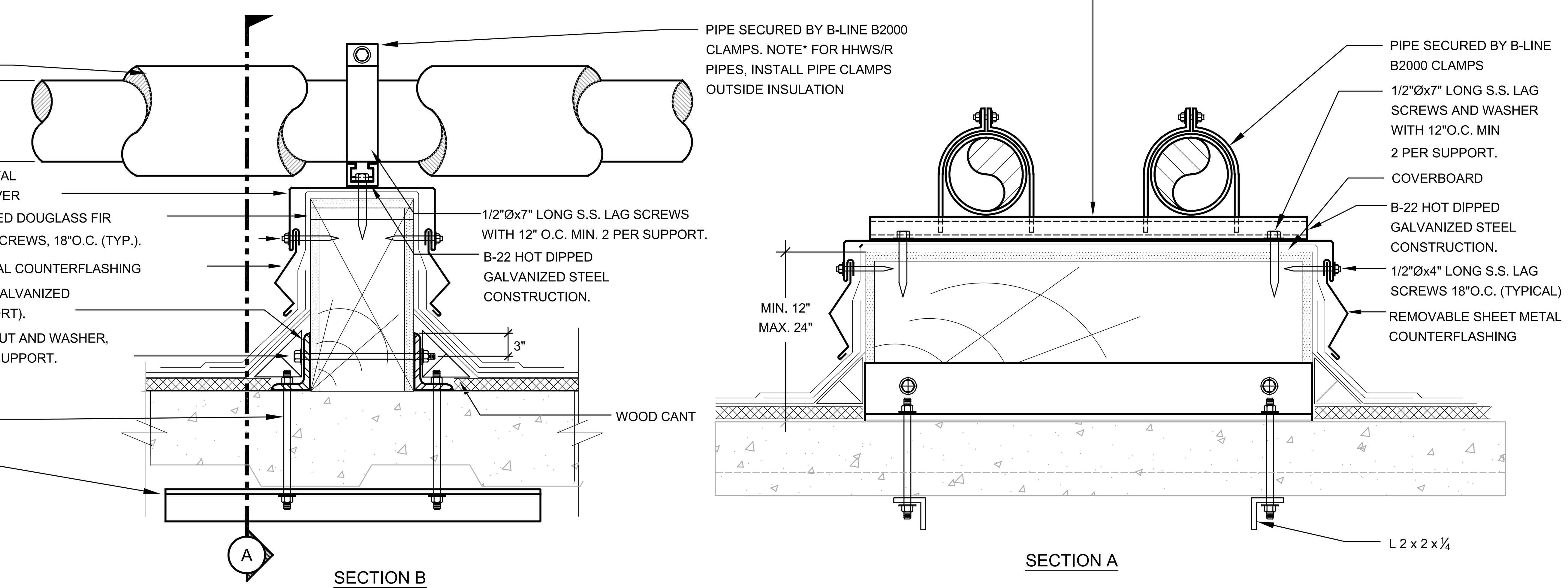
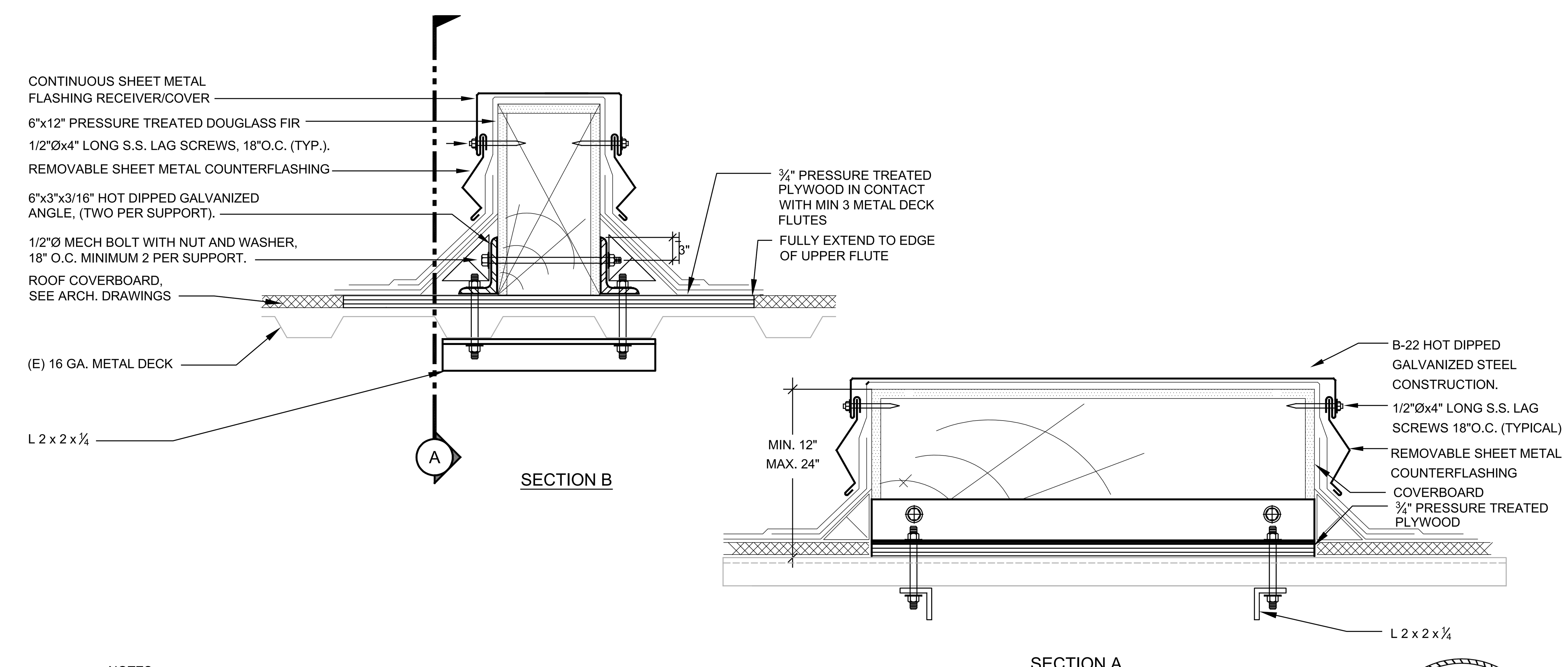


NOTES:

1. ALL STEEL MEMBERS AND COMPONENTS SHALL BE STAINLESS STEEL.
2. PIPE SUPPORT SPACING SHALL BE 10'-0" MAXIMUM.

ROOF PIPE SUPPORT NON STRUCTURAL CONCRETE (1 / -)

SCALE: NONE



NOTES:

1. ALL STEEL MEMBERS AND COMPONENTS SHALL BE STAINLESS STEEL.
2. PIPE SUPPORT SPACING SHALL BE 10'-0" MAXIMUM.

DUCT SUPPORT SLEEPER DETAIL (2 / M-891)

SCALE: NONE

REGISTERED PROFESSIONAL ENGINEER DAVID TAT MING PANG M 28479 MECHANICAL STATE OF CALIFORNIA

EXP. DATE: JUNE 30, 2021

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
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NO.	DATE	REVISION	BY	REC.	APP.
0	14MAY2021	CREATED FOR ADDENDUM NO.4	JH	GW	DP

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT:
DESIGN BY: JH
DRAWN BY: JH
DESIGN CHECKED BY: DAVID PANG R.P.E. No. M28479
PROJECT MANAGER JULIAN HO R.P.E.No. M39800
APPROVED: DAVID PANG PRINCIPAL IN CHARGE R.P.E. No. M28479

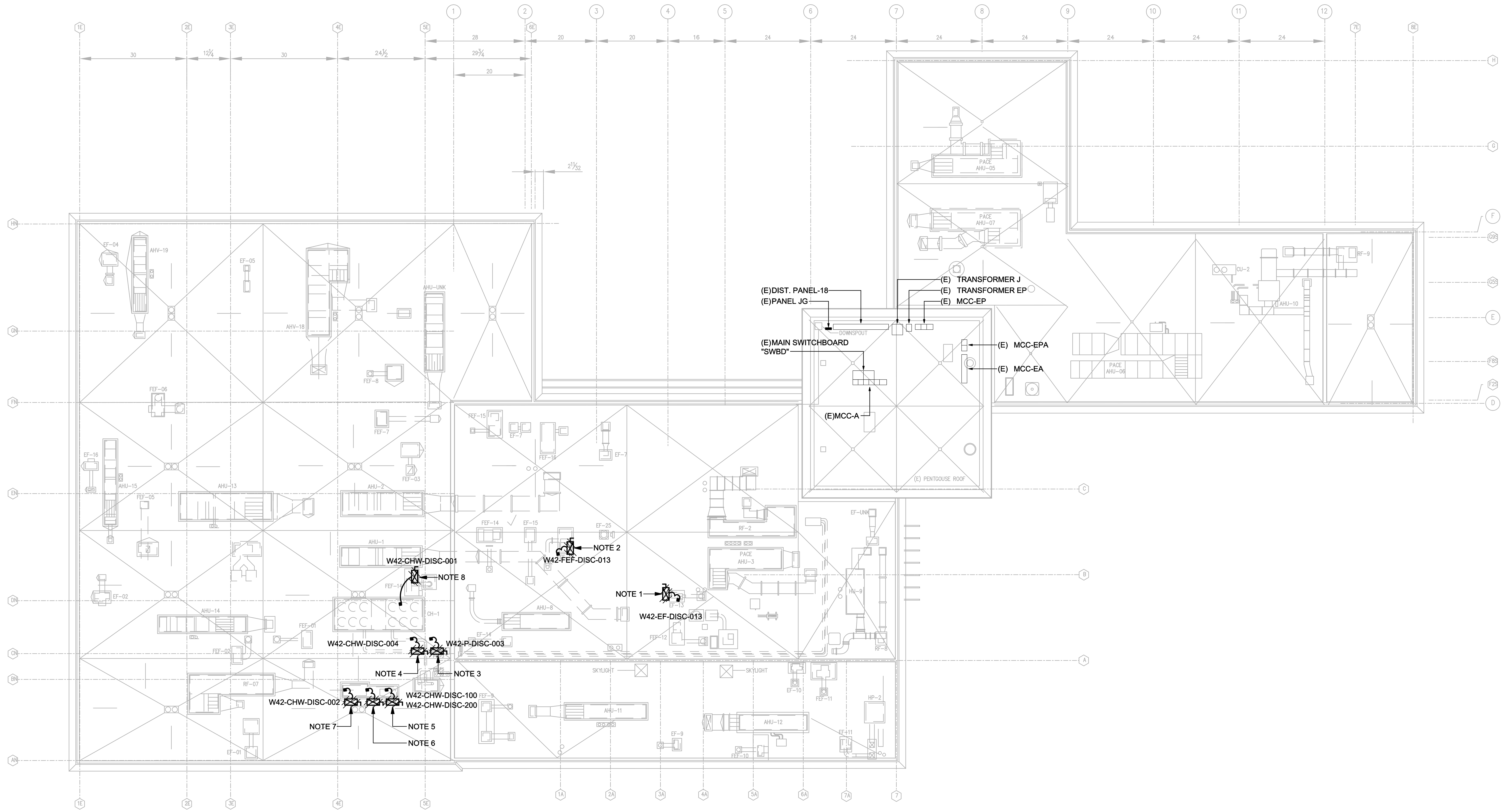
EBMUD:
PROJECT MANAGER D. LA MARCHE R.P.E. No. C87358
RECOMMENDED: G. WARREN SR. ENGINEER R.P.E. No. C65259

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
MECHANICAL
DETAILS SHEET – 5

SHEET NO. 36.1

SCALE AS NOTED
DATE 03/FEB/2021
W42.00–M–895 DRAWING NUMBER
REV. 0



1 DEMOLITION ELECTRICAL ROOF PLAN
SCALE: 1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO SHEET W42.00-E-201D FOR ADDITIONAL WORK.

NOTES:

1. DISCONNECT EQUIPMENT EF-013 AND REMOVE DISCONNECT SWITCH. REMOVE WIRING BACK TO "MCC-EA". REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE THE NEW UNIT INDICATED ON NEW PLAN IF FEASIBLE PER FIELD CONDITION, OTHERWISE REMOVE EXISTING CONDUIT.
2. DISCONNECT EQUIPMENT FEF-013 AND REMOVE DISCONNECT SWITCH. REMOVE WIRING BACK TO "MCC-A". REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE THE NEW UNIT INDICATED ON NEW PLAN IF FEASIBLE PER FIELD CONDITION, OTHERWISE REMOVE EXISTING CONDUIT.
3. DISCONNECT EQUIPMENT PUMP 3 AND REMOVE DISCONNECT SWITCH, CONDUIT AND WIRING BACK TO "MCC-A".
4. DISCONNECT EQUIPMENT PUMP 4 AND REMOVE DISCONNECT SWITCH, CONDUIT AND WIRING BACK TO "MCC-A".
5. DISCONNECT EQUIPMENT PUMP 5 AND REMOVE DISCONNECT SWITCH, CONDUIT AND WIRING BACK TO "MCC-A".
6. DISCONNECT EQUIPMENT PUMP 6 AND REMOVE DISCONNECT SWITCH , CONDUIT AND WIRING BACK TO "MCC-A".
7. DISCONNECT EQUIPMENT CHILLER 2 AND REMOVE DISCONNECT SWITCH, CONDUIT AND WIRING BACK TO "MCC-A".
8. DISCONNECT EQUIPMENT CHILLER 1 AND REMOVE DISCONNECT SWITCH. REMOVE WIRING BACK TO "MSWB". REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE THE NEW UNIT INDICATED ON NEW PLAN IF FEASIBLE PER FIELD CONDITION, OTHERWISE REMOVE EXISTING CONDUIT.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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REGISTERED PROFESSIONAL ENGINEER
BENSON NGO
E 16075
Exp. 12-31-21
ELECTRICAL
STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT	DESIGN BY:	S. MA
	DRAWN BY:	S. MA
	DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO
	PROJECT MANAGER R.P.E.No. M 28479	D. PANG
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG
EBMUD	PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE
	RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
DEMOLITION ROOF PLAN

SHEET NO. 37

SCALE AS NOTED
DATE 03/FEB/2021
DRAWING NUMBER W42.00-E-100D
REV. 0

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
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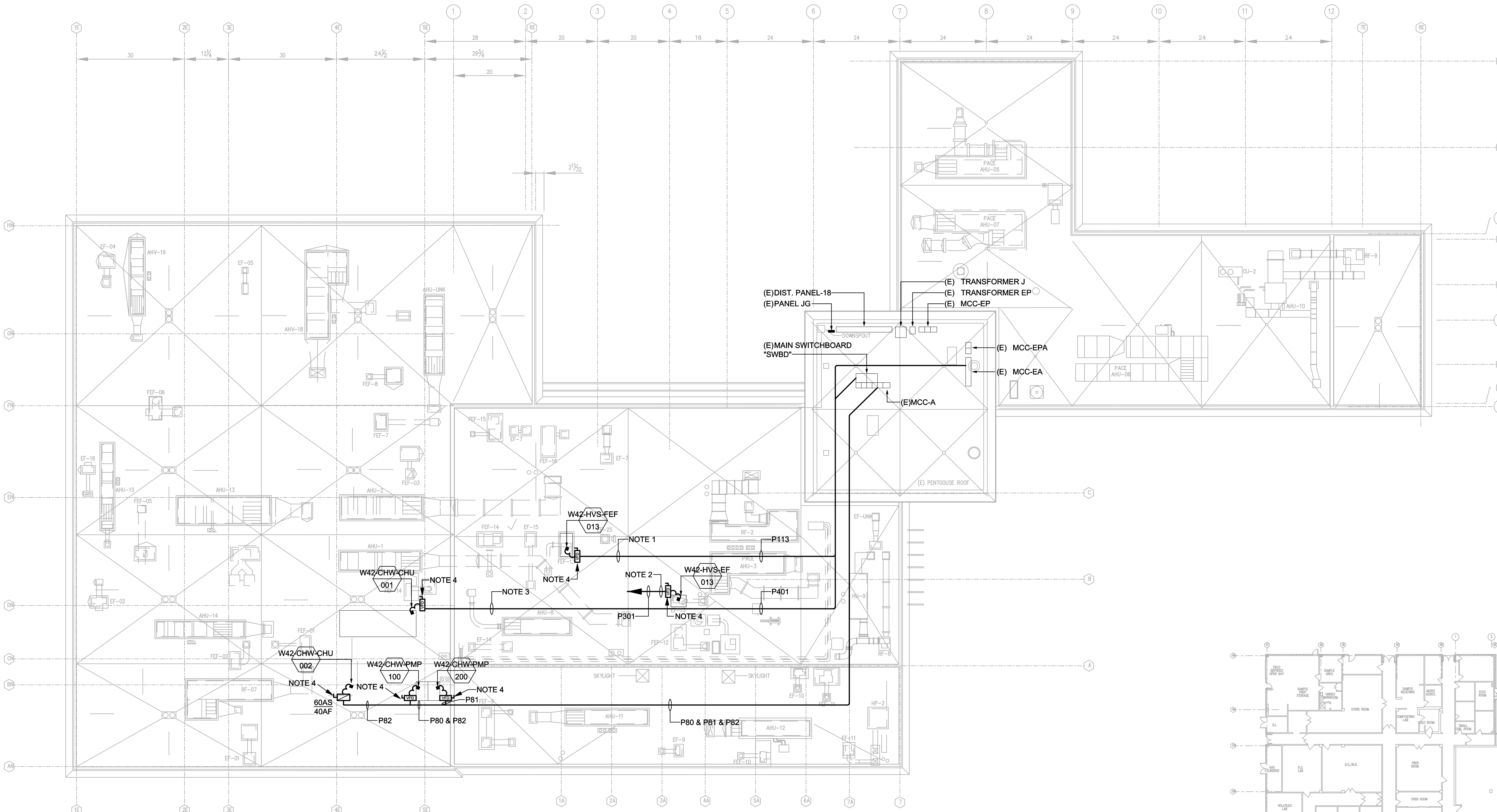


1 NEW ELECTRICAL ROOF PLAN
SCALE: 1/16" = 1'-0"
NORTH

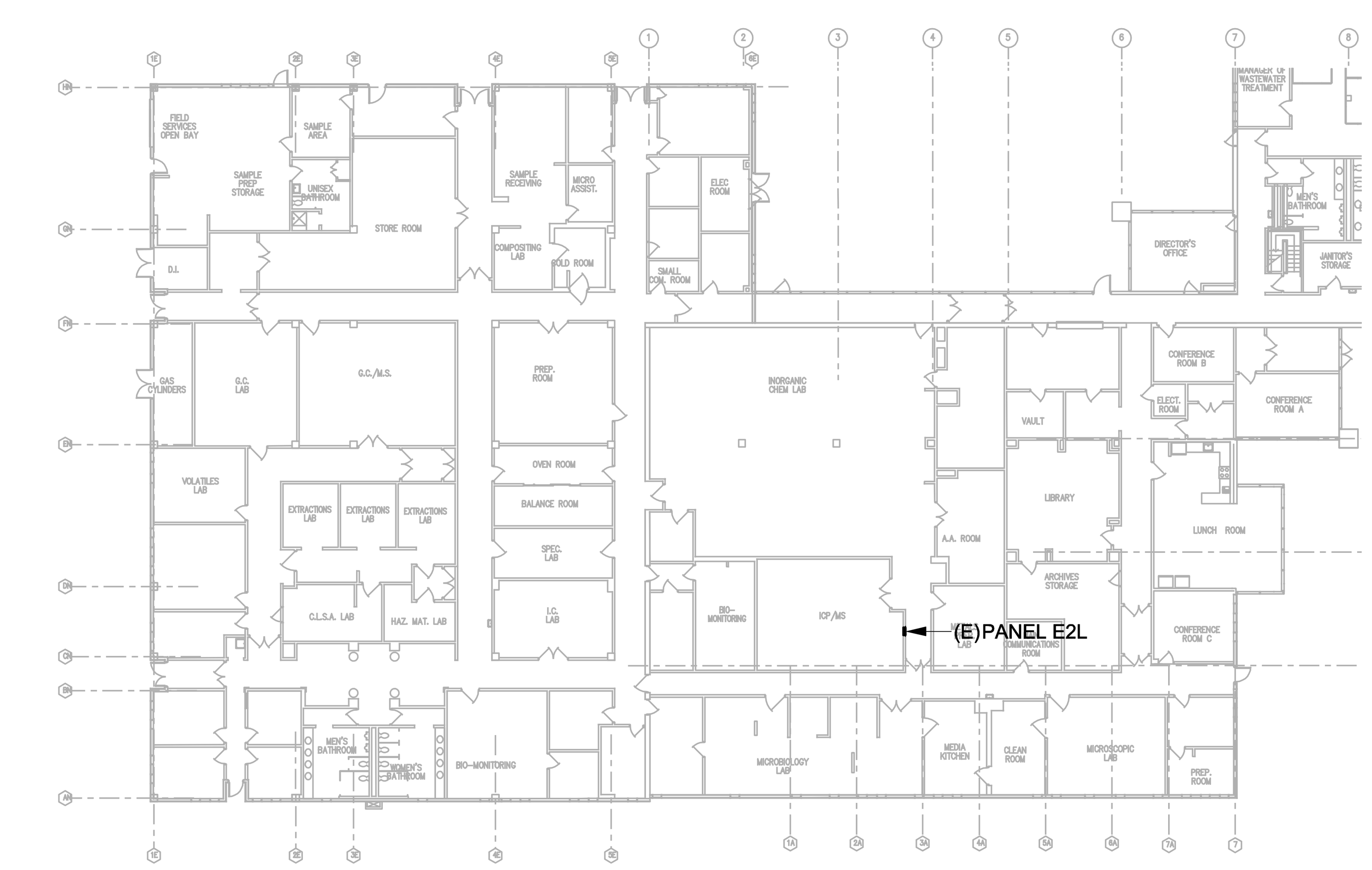
NOTES:

1. INTERCEPT AND EXTEND EXISTING CONDUIT TO CONNECT NEW VFD. PROVIDE NEW WIRING IN ITS ENTIRETY FROM "MCC-EA" TO THE VFD.

2. INTERCEPT AND EXTEND EXISTING CONDUIT TO CONNECT NEW VFD. PROVIDE NEW WIRING IN ITS ENTIRETY FROM PANEL "E2L" TO THE VFD. SEE2/42-00-E-100 ON THIS SHEET FOR PANEL "E2L" LOCATION.

3. INTERCEPT AND EXTEND EXISTING CONDUIT TO CONNECT NEW VFD. PROVIDE NEW WIRING IN ITS ENTIRETY FROM MAIN SWITCHBOARD "SWBD" TO THE VFD.

4. ALL DISCONNECT SWITCHES SHALL BE TYPE NEMA 4X, SS316.



2 FIRST FLOOR PLAN
SCALE: 1/32" = 1'-0"
NORTH

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
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REGISTERED PROFESSIONAL ENGINEER BENSON NGO E 16075 Exp. 12-31-21 ELECTRICAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT	DESIGN BY:	S. MA
	DRAWN BY:	S. MA
	DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO
	PROJECT MANAGER R.P.E.No. M 28479	D. PANG
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG
EBMUD	PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE
	RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
ROOF PLAN

SHEET NO. 38

SCALE AS NOTED
DATE 03/FEB/2021
W42.00-E-100
DRAWING NUMBER
0
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME

USER: $$USER$$$$ PLOT SCALE: PLOT$SCALE
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

CONDUIT SCHEDULE

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
P80	3/4"	3#12, 1#12 (G)	MCC-A	W-42-CHW-PMP-100	
P81	3/4"	3#12, 1#12 (G)	MCC-A	W-42-CHW-PMP-200	
P82	3/4"	3#8, 1#10 (G)	MCC-A	W-42-CHW-CHU-002	
P113	3/4"	3#12, 1#12 (G)	MCC-EA	W-42-HVS-FEF-013	
P301	3/4"	3#12, 1#12 (G)	PANEL EL	W-42-HVS-EF-013	
P401	(2) 2.6"	3#250, 1#2 (G)	SWBD	W-42-CHW-CHU-001	

REGISTERED PROFESSIONAL ENGINEER
BENSON NGO
E 16075
Exp. 12-31-21
ELECTRICAL
STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

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NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: S. MA
DRAWN BY: S. MA
DESIGN CHECKED BY: B. NGO
R.P.E. No. E 16075
PROJECT MANAGER D. PANG
R.P.E.No. M 28479
APPROVED:
PRINCIPAL IN CHARGE D. PANG
R.P.E. No. M 28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED:
SR. ENGINEER
R.P.E. No. E 16072 R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
CONDUIT SCHEDULE

SHEET NO. 39

SCALE NONE
DATE 03/FEB/2021
W42–00–E–120
DRAWING NUMBER
0
REV.

NOTES:

1. DISCONNECT AND REMOVE CIRCUIT BREAKER.
2. REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE NEW REPLACEMENT UNIT AS INDICATED ON NEW SINGLE LINE DIAGRAM.
3. REMOVE EXISTING CONDUCTOR IN CONDUIT.

SYMBOL LEGEND:

- (thin line) INDICATES EXISTING WORK TO REMAIN.
- (hatched line) INDICATES EXISTING WORK TO BE REMOVED.
- (heavy line) INDICATES NEW WORK.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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REGISTERED PROFESSIONAL ENGINEER BENSON NGO E 16075 Exp. 12-31-21 ELECTRICAL STATE OF CALIFORNIA

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0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

DESIGN BY:	S. MA	
DRAWN BY:	S. MA	
DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO	
PROJECT MANAGER R.P.E.No. M 28479	D. PANG	
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG	
PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE	
RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
OVERVIEW
DEMOLITION SINGLE LINE DIAGRAM

SHEET NO. 40

SCALE NONE
DATE 03/FEB/2021
W42.00-E-201D DRAWING NUMBER
REV. 0

NOTES:

1. PROVIDE NEW EATON CIRCUIT BREAKER IN PLACE. ELECTRICAL CHARACTERISTIC TO MATCH EXISTING..
2. VFD FURNISHED BY MECHANICAL, INSTALLED AND CONNECTED BY ELECTRICAL.

SYMBOL LEGEND:

- INDICATES EXISTING WORK TO REMAIN.
- INDICATES EXISTING WORK TO BE REMOVED.
- INDICATES NEW WORK.

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

REGISTERED PROFESSIONAL ENGINEER BENSON NGO E 16075 Exp. 12–31–21 ELECTRICAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402–MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT	DESIGN BY:	S. MA
	DRAWN BY:	S. MA
	DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO
	PROJECT MANAGER R.P.E.No. M 28479	D. PANG
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG
EBMUD	PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE
	RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
OVERVIEW
SINGLE LINE DIAGRAM

SHEET NO. 41

SCALE NONE
DATE 03/FEB/2021
W42.00–E–201 DRAWING NUMBER
0 REV.

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
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DATE: $$$$$$DATE$$$$$$
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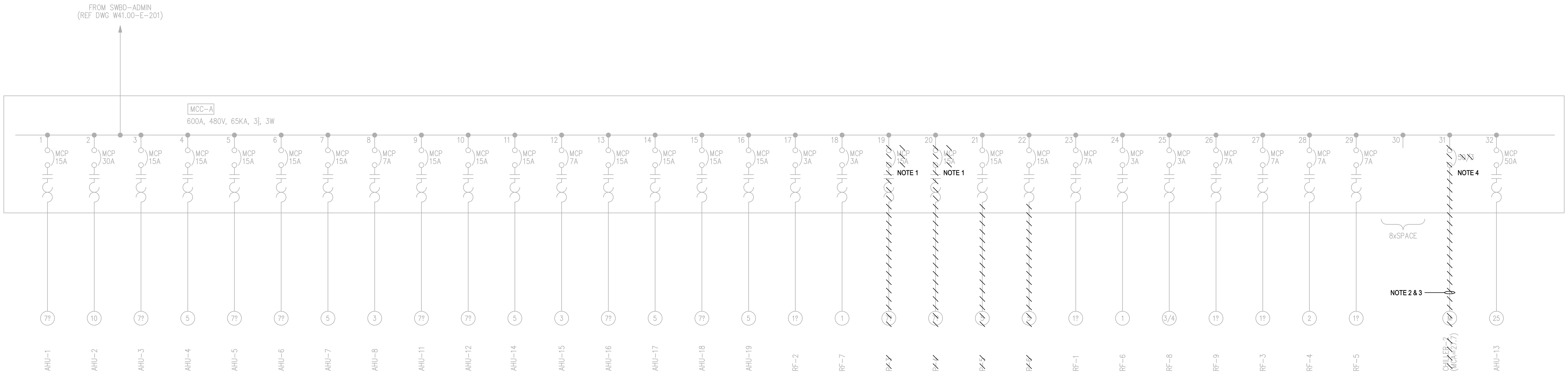

NOTES:

1. REMOVE STARTER. SEE NEW SINGLE LINE DIAGRAM FOR NEW WORK.
2. REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE NEW REPLACEMENT UNIT AS INDICATED ON NEW SINGLE LINE DIAGRAM.
3. REMOVE EXISTING CONDUCTOR IN CONDUIT.
4. REMOVE CIRCUIT BREAKER. SEE NEW SINGLE LINE DIAGRAM FOR NEW WORK.

REGISTERED PROFESSIONAL ENGINEER
BENSON NGO
E 16075
Exp. 12-31-21
ELECTRICAL
STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT	DESIGN BY:	S. MA
	DRAWN BY:	S. MA
	DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO
	PROJECT MANAGER R.P.E.No. M 28479	D. PANG
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG
EBMUD	PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE
	RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
MCC-A
DEMOLITION SINGLE LINE DIAGRAM

SHEET NO. 42

SCALE NONE
DATE 03/FEB/2021
W42.00-E-202D DRAWING NUMBER
0 REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME

PLOT SCALE: PLOT$SCALE
USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

NOTES:

1. PROVIDE NEW EATON CIRCUIT BREAKER IN PLACE. ELECTRICAL CHARACTERISTIC TO MATCH EXISTING.
2. VFD FURNISHED BY MECHANICAL, INSTALLED AND CONNECTED BY ELECTRICAL.

REGISTERED PROFESSIONAL ENGINEER
BENSON NGO
E 16075
Exp. 12-31-21
ELECTRICAL
STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

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0	03FEB2021	CREATED FOR SD402	SM	RM	BN

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

CONSULTANT
DESIGN BY: S. MA
DRAWN BY: S. MA
DESIGN CHECKED BY: B. NGO
R.P.E. No. E 16075
PROJECT MANAGER D. PANG
R.P.E.No. M 28479
APPROVED:
PRINCIPAL IN CHARGE D. PANG
R.P.E. No. M 28479

EBMUD
PROJECT MANAGER D. LA MARCHE
R.P.E. No. C87358
RECOMMENDED:
SR. ENGINEER
R.P.E. No. E 16072 R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
MCC-A
SINGLE LINE DIAGRAM

SHEET NO. 43

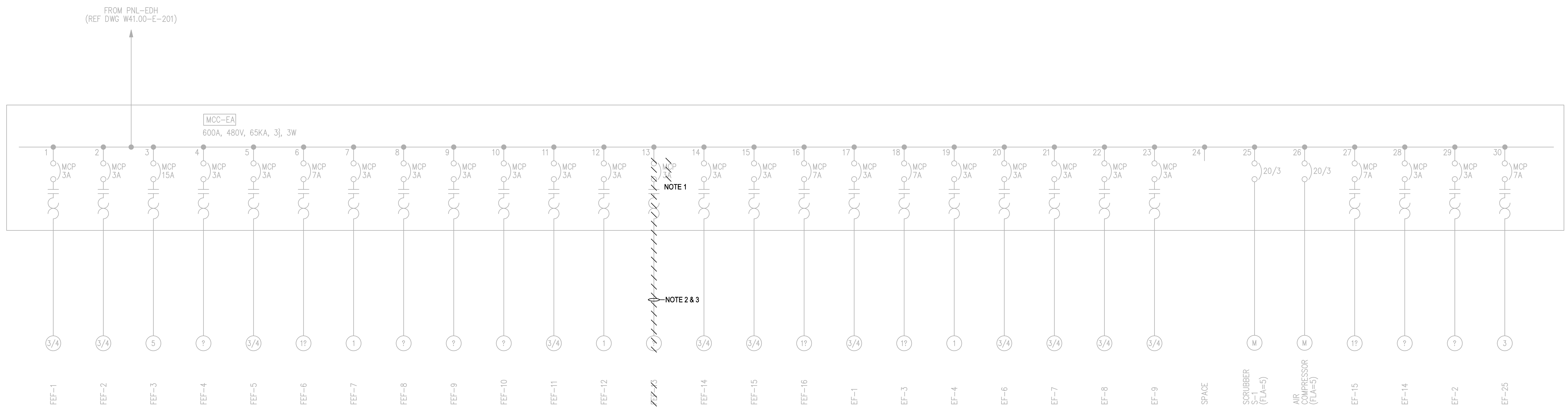
SCALE NONE
DATE 03/FEB/2021
W42.00-E-202
DRAWING NUMBER
0
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME

PLOT SCALE: PLOT$SCALE
USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$



NOTES:

1. REMOVE STARTER. SEE NEW SINGLE LINE DIAGRAM FOR NEW WORK.
2. REUSE EXISTING CONDUIT TO ITS FULLEST EXTENT TO SERVE NEW REPLACEMENT UNIT AS INDICATED ON NEW SINGLE LINE DIAGRAM.
3. REMOVE EXISTING CONDUCTOR IN CONDUIT.

REGISTERED PROFESSIONAL ENGINEER
BENSON NGO
E 16075
Exp. 12-31-21
ELECTRICAL
STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

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SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

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	DRAWN BY:	S. MA
	DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO
	PROJECT MANAGER R.P.E.No. M 28479	D. PANG
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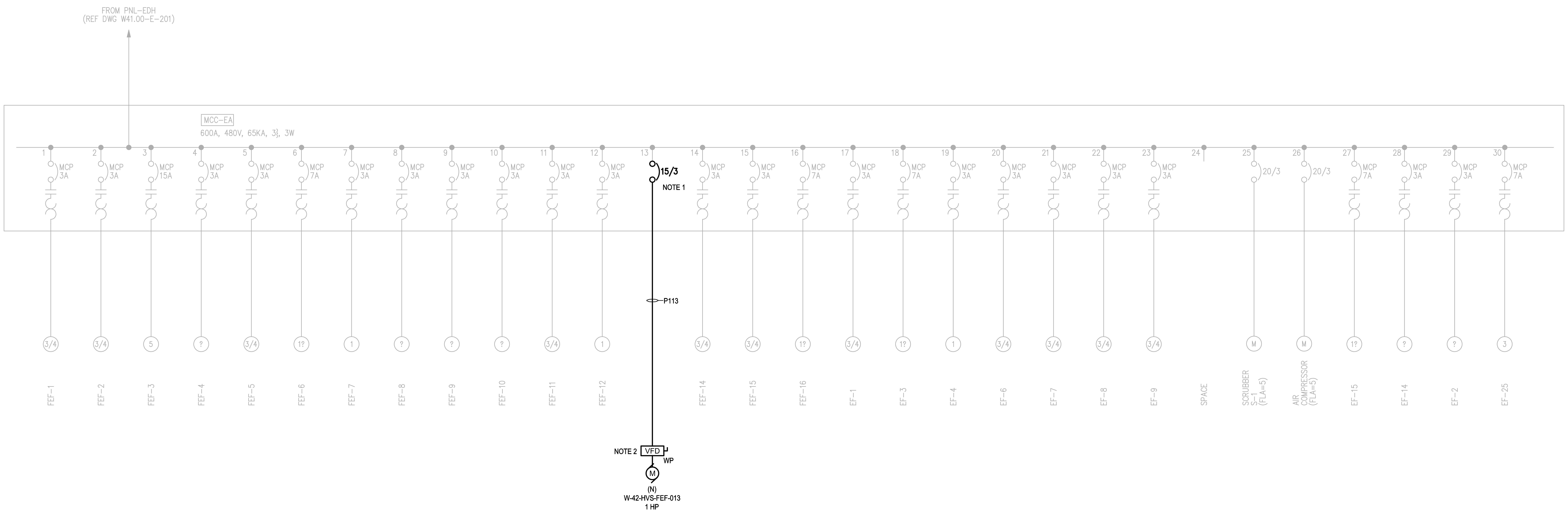
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
MCC-EA
DEMOLITION SINGLE LINE DIAGRAM

SHEET NO. 44

SCALE NONE
DATE 03/FEB/2021
W42.00-E-203D
DRAWING NUMBER
0
REV.



NOTES:

1. PROVIDE NEW EATON CIRCUIT BREAKER IN PLACE. ELECTRICAL CHARACTERISTIC TO MATCH EXISTING..
2. VFD FURNISHED BY MECHANICAL, INSTALLED AND CONNECTED BY ELECTRICAL.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
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3" ON ORIGINAL DOCUMENT
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
MCC-EA
SINGLE LINE DIAGRAM

SHEET NO. 45

SCALE NONE
DATE 03/FEB/2021
DRAWING NUMBER W42.00-E-203
REV. 0

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
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REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$
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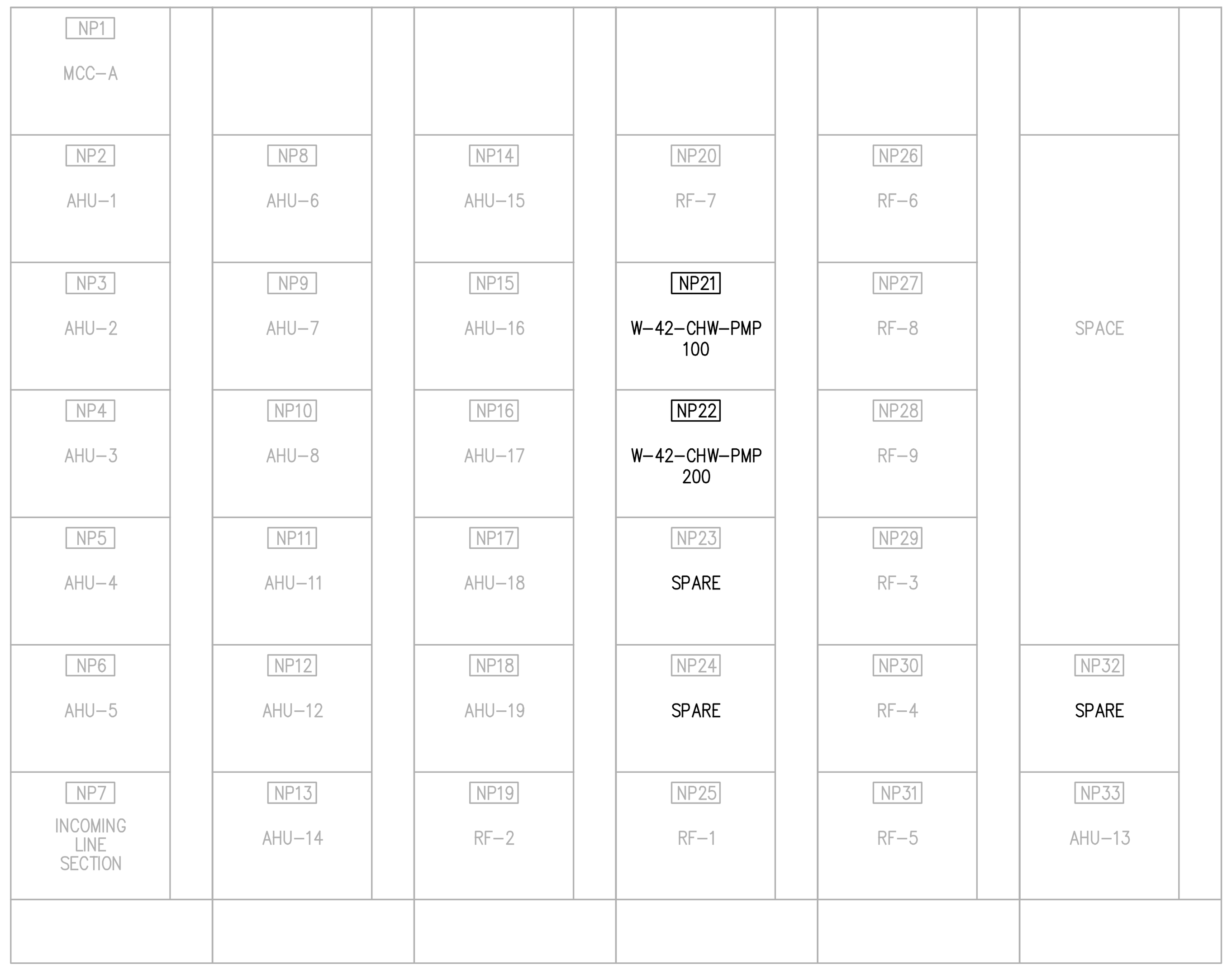
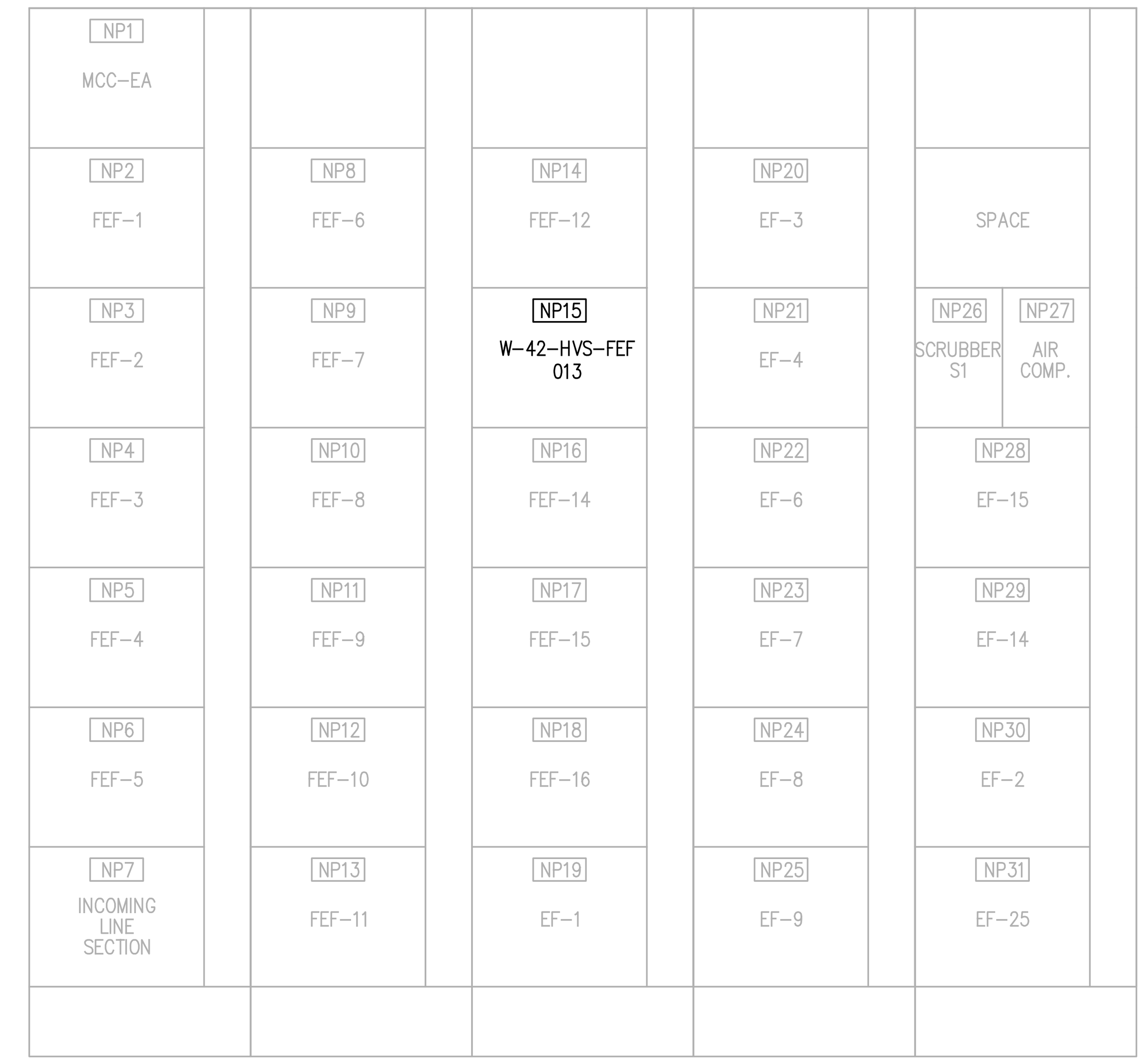
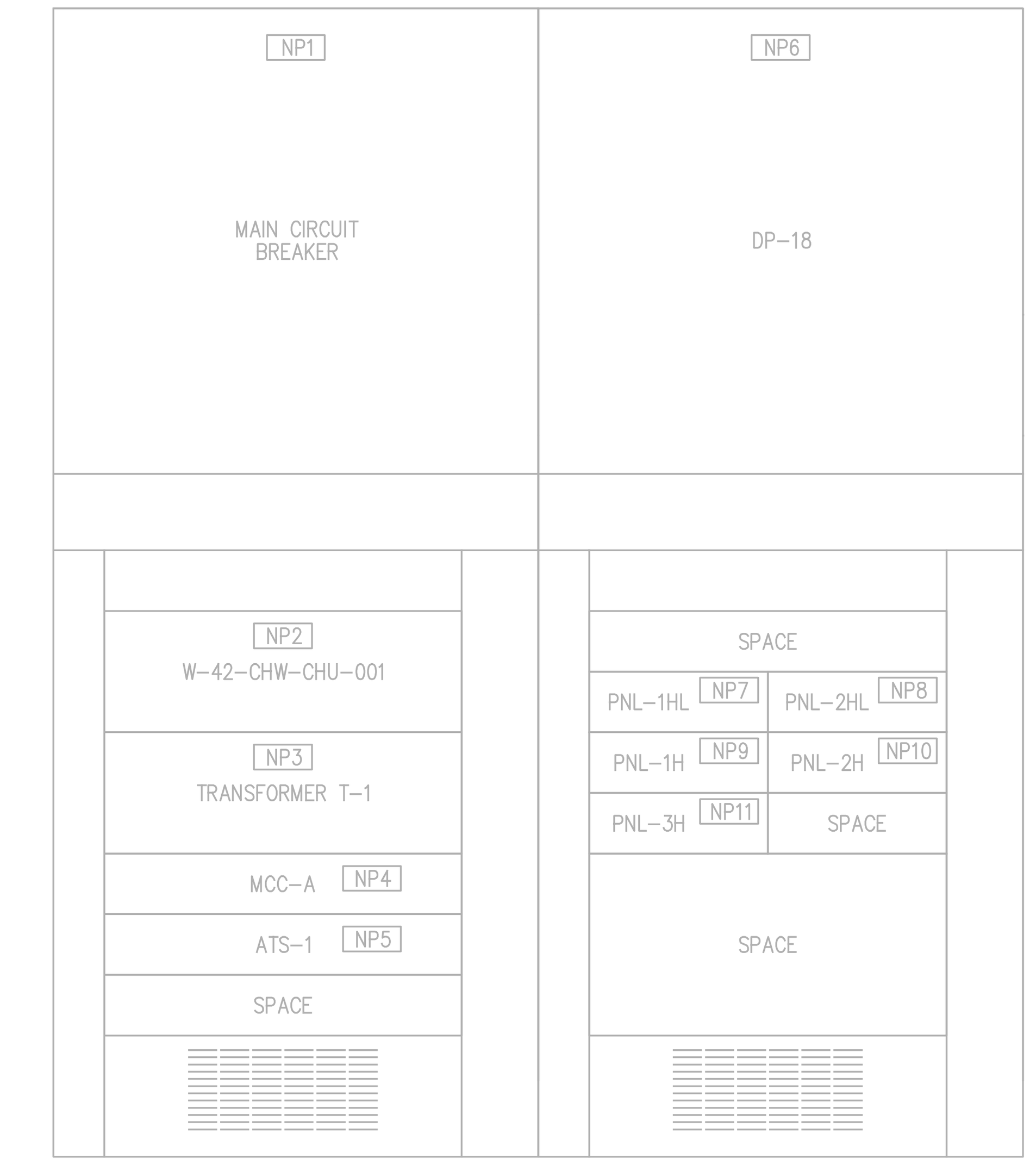


MCC-A ELEVATION
NTS



MCC-EA ELEVATION
NTS



SWBD – ADMIN
NTS

MCC-A NAMEPLATE SCHEDULE

	NP#	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	SIZE
	1	MCC-A			TBD
	2	AHU-1			TBD
	3	AHU-2			TBD
	4	AHU-3			TBD
	5	AHU-4			TBD
	6	AHU-5			TBD
	7	INCOMING	LINE	SECTION	TBD
	8	AHU-6			TBD
	9	AHU-7			TBD
	10	AHU-8			TBD
	11	AHU-11			TBD
	12	AHU-12			TBD
	13	AHU-14			TBD
	14	AHU-15			TBD
	15	AHU-16			TBD
	16	AHU-17			TBD
	17	AHU-18			TBD
	18	AHU-19			TBD
	19	RF-2			TBD
	20	RF-7			TBD
NOTE 2	21	W-42-CHW-PMP-100			TBD
NOTE 3	22	W-42-CHW-PMP-200			TBD
	23	SPARE			TBD
	24	SPARE			TBD
	25	RF-1			TBD
	26	RF-6			TBD
	27	RF-8			TBD
	28	RF-9			TBD
	29	RF-3			TBD
	30	RF-4			TBD
	31	RF-5			TBD
NOTE 4	32	W-42-CHW-CHU-002			TBD
	33	AHU-13			TBD

MCC-EA NAMEPLATE SCHEDULE

	NP#	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	SIZE
	1	MCC-EA	BREAKER		TBD
	2	FEF-1			TBD
	3	FEF-2			TBD
	4	FEF-3			TBD
	5	FEF-4			TBD
	6	FEF-5			TBD
	7	INCOMING	LINE	SECTION	TBD
	8	FEF-6			TBD
	9	FEF-7			TBD
	10	FEF-8			TBD
	11	FEF-9			TBD
	12	FEF-10			TBD
	13	FEF-11			TBD
	14	FEF-12			TBD
NOTE 1	15	W-42-HVS-FEF-013			TBD
	16	FEF-14			TBD
	17	FEF-15			TBD
	18	FEF-16			TBD
	19	EF-1			TBD
	20	EF-3			TBD
	21	EF-4			TBD
	22	EF-6			TBD
	23	EF-7			TBD
	24	EF-8			TBD
	25	EF-9			TBD
	26	SCRUBBER	S1		TBD
	27	AIR	COMPRESSOR		TBD
	28	EF-15			TBD
	29	EF-14			TBD
	30	EF-2			TBD
	31	EF-25			TBD

SWBD-ADMIN NAMEPLATE SCHEDULE

NP#	LINE 1 TEXT	LINE 2 TEXT	SIZE
1	MAIN CIRCUIT	BREAKER	TBD
2	W-42-CHW-CHU-001		TBD
3	XFMR T-1		TBD
4	MCC-A		TBD
5	ATS-1		TBD
6	DP-18		TBD
7	PNL-1HL		TBD
8	PNL-2HL		TBD
9	PNL-1HL		TBD
10	PNL-2HL		TBD
11	PNL-3H		TBD

NOTES:

1. UPDATE EQUIPMENT TAG LABEL TO READ "W-42-HVS-FEF-013".
2. UPDATE EQUIPMENT TAG LABEL TO READ "W-42-CHW-PMP-100".
3. UPDATE EQUIPMENT TAG LABEL TO READ "W-42-CHW-PMP-200".
4. UPDATE EQUIPMENT TAG LABEL TO READ "W-42-CHW-CHU-002".

REGISTERED PROFESSIONAL ENGINEER BENSON NGO E 16075 Exp. 12-31-21 ELECTRICAL STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

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SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

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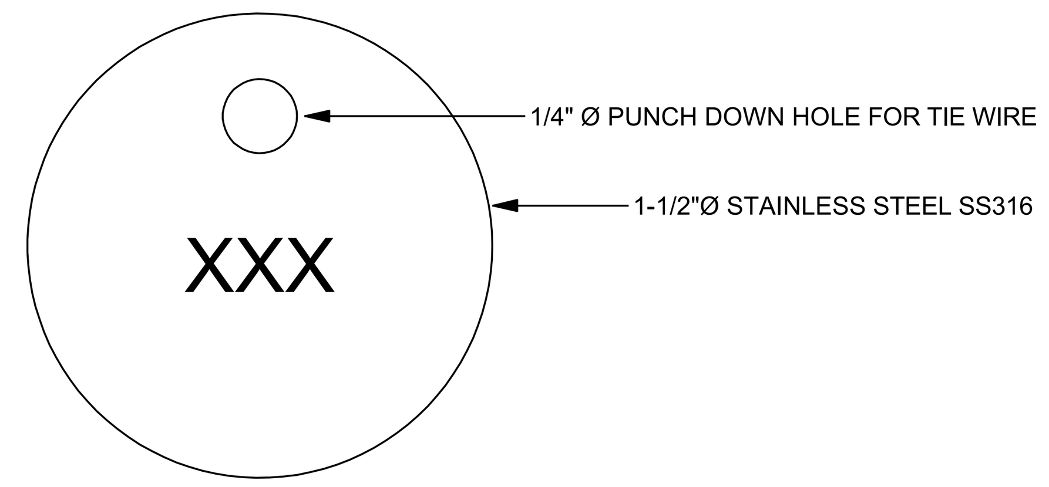
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
SWBD & MCC ELEVATIONS

SHEET NO. 46

SCALE NONE
DATE 03/FEB/2021
DRAWING NUMBER W42.00-E-220
REV. 0



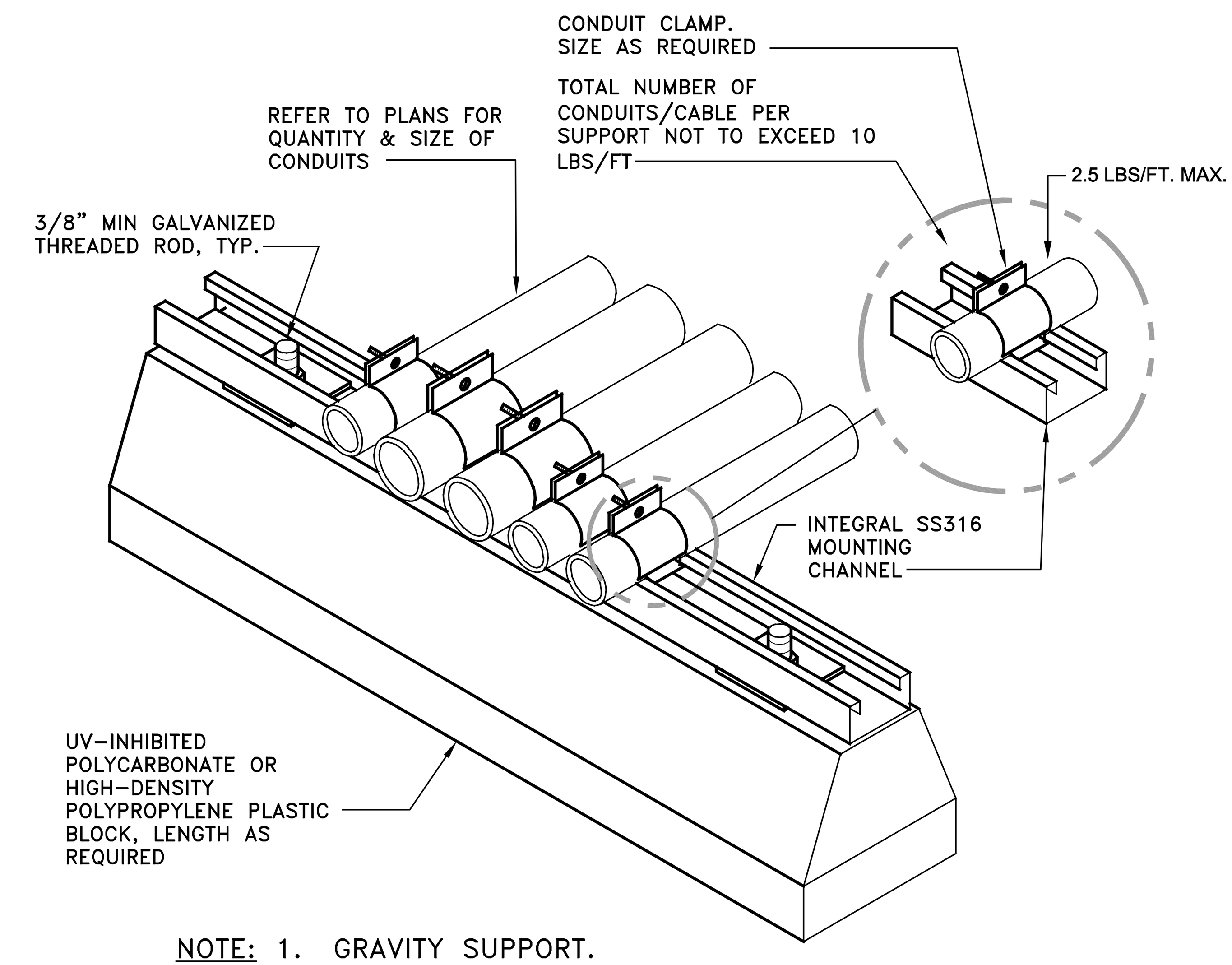
INSTRUMENT TAG

NOTES:

1. WHERE XXX IS THE INSTRUMENT OR EQUIPMENT TAG NAME OR TAG NUMBER IN COMPLIANCE WITH DISTRICT TAGNAME CONVENTIONS OR IN ACCORDANCE WITH THE CONDUIT SCHEDULE.
2. LETTER SIZE SHALL BE 1/4" MINIMUM.
3. HANG INSTRUMENT TAG ON INSTRUMENT WITH STAINLESS STEEL WIRE.
4. ATTACH CONDUIT TAG WITH STAINLESS STEEL BANDS.

3 CONDUIT AND INSTRUMENT TAG DETAIL

SCALE: NONE



NOTE:
1. GRAVITY SUPPORT.
2. MAXIMUM SPACING 6'-0".
3. PROVIDE BETWEEN CONDUIT SUPPORT SHOWN IN DETAIL NO 4.

2 CONDUIT SUPPORT ON ROOF DETAIL

SCALE: NONE

SYSTEM NO. W-L-1001

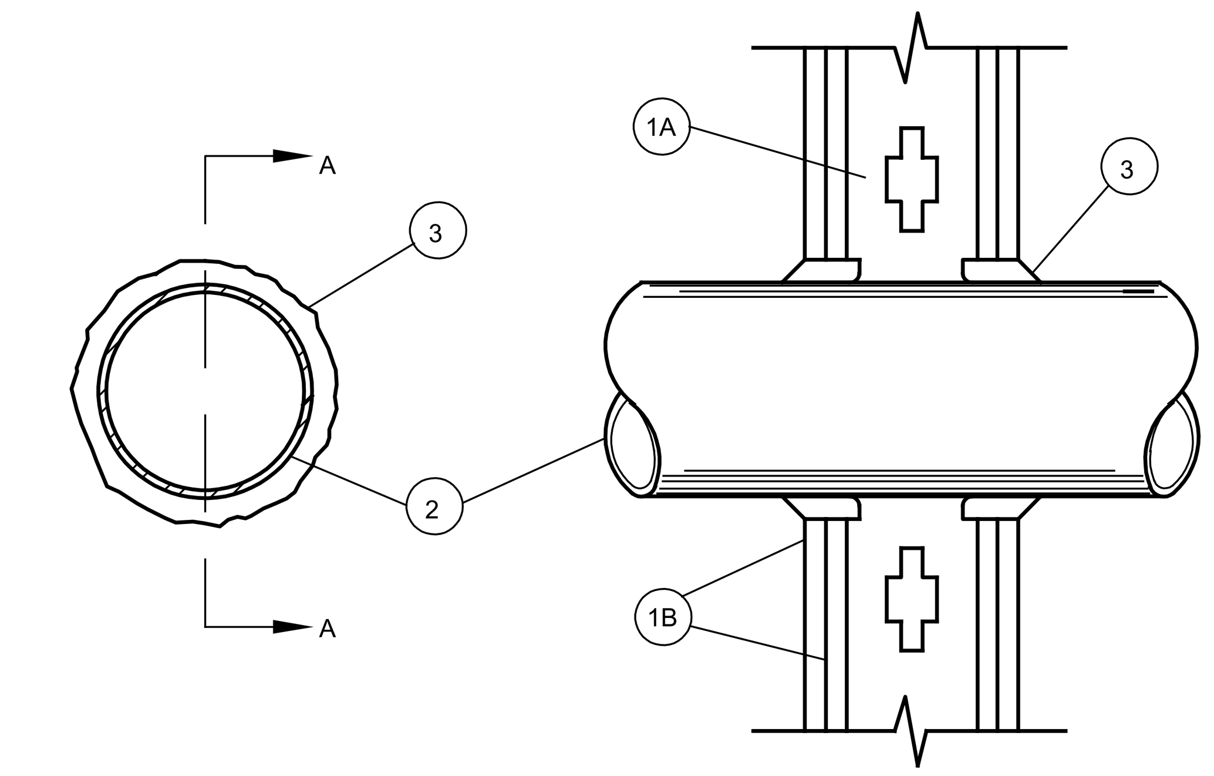
JUNE 15, 2005

F RATINGS - 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)

T RATINGS - 0, 1, 2, 3, AND 4 HR (SEE ITEM 3)

L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT

L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



1. WALL ASSEMBLY - THE 1, 2, 3 OR 4 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 HR FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.
   B. GYPSUM BOARD* - NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN. (0 MM) (POINT CONTACT) TO MAX 2 IN. (51 MM). PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. STEEL PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.
   A. CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING
   B. COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING
   C. COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   D. THROUGH PENETRATING PRODUCT* - FLEXIBLE METAL PIPING - THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:
      1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. OMEGA FLEX INC
      2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. TITEFLEX CORP A BUNDY CO
      3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL* - CAULK OR SEALANT – MIN 5/8. 1-1/4,1-7/8 AND 2-1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

MAX PIPE OR CONDUIT DIAM IN. (mm)	F RATING HR	T RATING HR
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

+WHEN COPPER PIPE IS USED, T RATING IS 0 HR.
3M COMPANY – CP 25WB+ CAULK OR FB-3000 WT SEALANT,
*BEARING THE UL CLASSIFICATION MARKING

1 ONE CONDUIT PENETRATION THROUGH FIRE RATED WALL

SCALE: NONE

REGISTERED PROFESSIONAL ENGINEER BENSON NGO E 16075 Exp. 12-31-21 ELECTRICAL STATE OF CALIFORNIA

SD402-MWWTP ADMIN, LAB, AND DEWATERING BUILDINGS HVAC IMPROVEMENTS

DESIGN BY:	S. MA	
DRAWN BY:	S. MA	
DESIGN CHECKED BY: R.P.E. No. E 16075	B. NGO	
PROJECT MANAGER R.P.E.No. M 28479	D. PANG	
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. M 28479	D. PANG	
PROJECT MANAGER R.P.E. No. C87358	D. LA MARCHE	
RECOMMENDED: SR. ENGINEER R.P.E. No. E 16072	R. MAC	

CONSULTANT / EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
ADMINISTRATION BLDG/LABORATORY
ELECTRICAL
DETAILS

SHEET NO. 47

SCALE NONE
DATE 03/FEB/2021

W42.00-E-901 DRAWING NUMBER
0 REV.

NO.	DATE	REVISION	BY	REC.	APP.
0	03FEB2021	CREATED FOR SD402	SM	RM	BN

GAYNER ENGINEERS
1133 POST STREET
SAN FRANCISCO, CA 94109
TELEPHONE (415) 474-9500
FAX (415) 474-1363

3" ON ORIGINAL DOCUMENT
0 1 2 3

USER: $$USER$$$
DATE: $$$$$$DATE$$$$$$$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$$$$$$$$$
PLOT SCALE: PLOT$SCALE

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

EAST BAY MUNICIPAL UTILITY DISTRICT

SD-185 LABORATORY EXPANSION — BID & CONSTRUCTION

ED2 International

JULY 29, 1991

Issuances and Revisions

No.	Date	Description
0	1-15-91	ISSUED FOR CONSTRUCTION
	9-13-94	AS BUILT
	1-16-96	IN SERVICE 26 AUG 1994 AS BUILT REF.

Date 7/29/91

Sheet Title

COVER SHEET

Project No. 9002

T1.1 Sheet No. 1/178

0 Revision

ABBREVIATIONS*

A	AIR	F.A.	FIRE ALARM	N	NORTH	T	TREAD
A.B.	ANCHOR BOLT	F.B.	FLAT BAR	(N)	NEW	TEL.	TELEPHONE
A.C.	ASPHALT CONCRETE	F.D.	FLOOR DRAIN	N.I.C.	NOT IN CONTRACT	TEMP.	TEMPORARY
ACOUS.	ACOUSTIC	FDN.	FOUNDATION	NO.	NUMBER	TEXT.	TEXTURE
ADJ.	ADJUSTABLE/ADJACENT	F.E.	FIRE EXTINGUISHER	NOM.	NOMINAL	T. & G.	TONGUE AND GROOVE
A.F.S.	ABOVE FINISH SLAB	F.F.	FINISH FLOOR	N.T.S.	NOT TO SCALE	THK.	THICK OR THICKNESS
ALUM.	ALUMINUM	F.F.D.	FLUSH FLOOR DRAIN			T.O.	TOP OF
ALT.	ALTERNATE	F.G.	FINISH GRADE			TOIL.	TOILET
ANOD.	ANODIZED	F.H.M.S.	FLAT HEAD MACHINE SCREW	O.A.	OVERALL	T.P.D.	TOILET PAPER DISPENSER
A.P.	ACCESS PANEL			O.C.	ON CENTER		
APPROX.	APPROXIMATE	FIN.	FINISH	O.D.	OUTSIDE DIAMETER	TYP.	TYPICAL
ASP.	ASPHALT	FIXT.	FIXTURE	OFC.	OFFICE		
		FLR.	FLOOR	O.H.	OPPOSITE HAND		
		FLUOR.	FLUORESCENT	O.H.S.M.S.	OVALHEAD SHEET METAL SCREW	U.B.C.	UNIFORM BUILDING CODE
BD.	BOARD	F.N.D.	FEMININE NAPKIN DISPOSAL	OPNG.	OPENING	UNFIN.	UNFINISHED
BET.	BETWEEN			OPP.	OPPOSITE	U.O.N.	UNLESS OTHERWISE NOTED
BITUM.	BITUMINOUS	F.N.V.	FEMININE NAPKIN VENDOR				
BLDG.	BUILDING					U.S.	UNITED STATES
BLK.	BLOCK	F.O.S.	FACE OF STUD	P	PAINT		
BLK'G.	BLOCKING	F.O.W.	FACE OF WALL	PART.	PARTITION		
BM.	BEAM	FPRO.	FIREPROOF	P.B.	PULL BOX	V.	VACUUM
BOT.	BOTTOM	FR.	FRAME	PERF.	PERFORATED	V.C.T.	VINYL COMPOSITION TILE
B.R.F.	BOTTOM OF ROOF FRAMING	F.S.	FINISH SURFACE	PF.	PREFINISHED		
		FTG.	FOOTING	PG & E	PACIFIC GAS & ELECTRIC	VEN.	VENEER
		FURR.	FURRING			VEND'G.	VENDING
CAB.	CABINET	FXD.	FIXED	PL.	PLATE	VER.	VERIFY
C.B.	CONCRETE BLOCK			P.L.	PROPERTY LINE	VERT.	VERTICAL
C/C	CENTER TO CENTER			PLAS.	PLASTER OR PLASTIC	VEST.	VESTIBULE
CEM.	CEMENT	G.	GAS	PLUMB.	PLUMBING		
CER.	CERAMIC	GA.	GAUGE	PLYWD.	PLYWOOD		
CHLOR.	CHLORINE	GALV.	GALVANIZED	POL.	POLISHED	W	WIDE
C.J.	CONTROL JOINT	GEN.	GENERAL	PR.	PAIR	W/	WITH
C.L.	CHAIN LINK	GL.	GLASS	PREFAB.	PREFABRICATED	W.C.	WATER CLOSET
CLT.	CLOSET	GLU-LAM.	GLUE LAMINATE	PROJ.	PROJECT OR PROJECTION	WD.	WOOD
CLG.	CEILING	GR.	GRADE			W.F.	WIDE FLANGE
CLR.	CLEAR	GYM.	GYMNASIUM	P.T.D.	PAPER TOWEL DISPENSER	WIND.	WINDOW
C.M.U.	CONCRETE MASONRY UNIT	GYP. BD.	GYPSUM BOARD			W.O.	WHERE OCCURS
COL.	COLUMN			PT.	POINT	W.P.	WATERPROOF
CONC.	CONCRETE					W.R.	WATER RESISTANT/ WASTE RECEPTACLE
CONST.	CONSTRUCTION	H	HIGH				
CONT.	CONTINUOUS	HB.	HANDBALL	R	RADIUS / RISER	WSCT.	WAINSCOT
CORR.	CORRIDOR	H.B.	HOSE BIB	RD.	ROUND	WT.	WEIGHT
C.T.	CERAMIC TILE	H.C.	HOLLOWCORE/ HANDICAPPED	R.D.	ROOF DRAIN		
CTR.	CENTER			REQ'D.	REQUIRED	&	AND
CTRSK.	COUNTERSINK	HDWR.	HARDWARE	RESIL.	RESILIENT	∠	ANGLE
CNTOP.	COUNTERTOP	H.M.	HOLLOW METAL	R.H.	ROBE HOOK	@	AT
		HORIZ.	HORIZONTAL	RM.	ROOM	℄	CENTER LINE
		H.P.	HIGH POINT	R.O.	ROUGH OPENING	Ø	DIAMETER
DBL.	DOUBLE	H.P.L.	HIGH PRESSURE LAMINATED	RBR.	RUBBER		
DEPRE.	DEPRESSED			RWD.	REDWOOD		
DET.	DETAIL	HR.	HOUR	RWL.	RAIN WATER LEADER		
D.F.	DOUGLAS FIR/ DRINKING FOUNTAIN	HT.	HEIGHT				
DIA.	DIAMETER			S	SINK		
DIAG.	DIAGONAL	I.D.	INSIDE DIAMETER	S.A.D.	SEE ARCHITECTURAL DRAWINGS		
DIM.	DIMENSION	INSUL.	INSULATION				
DISP.	DISPENSER			S.C.	SOLID CORE		
DN.	DOWN			SCHED.	SCHEDULE		
D.O.	DOOR OPENING	JAN.	JANITOR	S.D.	STORM DRAIN		
DR.	DOOR	JT.	JOINT	SECT.	SECTION		
				S.H.	SPRAY HOSE		
(E)	EXISTING	KD.	KNOCKDOWN	SH.	SHELF		
EA.	EACH	K/S	KNEE SPACE	SHT.	SHEET		
E.I.F.S.	EXTERIOR INSULATION & FINISH SYSTEM			SHT'G.	SHEATHING		
				SHW.	SHOWER		
EL.	ELEVATION	LAM.	LAMINATE	SIM.	SIMILAR		
ELECT.	ELECTRICAL	LAV.	LAVATORY	SL.	SLOPE		
E.P.B.	ELECTRICAL PANEL BOARD	LB.	POUND	S.L.	SKYLIGHT		
EQ.	EQUAL	LT.	LIGHT	SPECS.	SPECIFICATIONS		
EQUIP.	EQUIPMENT			SQ.	SQUARE		
ETC.	ETCETERA			S.S.	STAINLESS STEEL		
EXP.	EXPANSION	MACH.	MACHINE	STL.	STEEL		
EXPO.	EXPOSED	MAT'L	MATERIAL	STD.	STANDARD		
EXT.	EXTERIOR	MAX.	MAXIMUM	STOR.	STORAGE		
		M.B.	MACHINE BOLT	STRUCT.	STRUCTURAL		
		MECH.	MECHANICAL	SURF.	SURFACE		
		MEMB.	MEMBRANE	SUSP.	SUSPENDED		
		MET./MTL.	METAL	SYS.	SYSTEM		
		MFRG.	MANUFACTURING				
		MFR.	MANUFACTURER				
		MIN.	MINIMUM				
		MISC.	MISCELLANEOUS				
		M.O.	MASONRY OPENINGS				
		MTD.	MOUNTED				
		MUL.	MULLION				

* REFER TO SHEET A3.1 FOR LABORATORY ABBREVIATIONS USED IN THE 1/4" SCALE FLOOR PLANS

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE CURRENT REQUIREMENTS OF THE EAST BAY MUNICIPAL UTILITY DISTRICT (EBMUD) REGULATIONS, THE UNIFORM BUILDING CODE, 1988 EDITION AND THE LATEST EDITION OF ALL OTHER APPLICABLE LOCAL, STATE AND FEDERAL CODES AND ORDINANCES.

2. PROVIDE ALL NECESSARY PERSONNEL, EQUIPMENT AND TEMPORARY BARRICADES TO PROTECT THE PUBLIC DURING EXCAVATION, DEMOLITION AND CONSTRUCTION WORK. PROTECT STRUCTURES, SIDEWALKS, PAVEMENTS, FENCES, BENCHES, AND OTHER FACILITIES WITHIN OR ADJACENT TO THE CONSTRUCTION SITE AND NEIGHBORING PROPERTIES FROM DAMAGE DUE TO SETTLEMENT, UNDERMINING, WASH-OUT OR OTHER HAZARDS CREATED BY EARTHWORK AND DEMOLITION OPERATIONS. MAINTAIN ALL BENCH MARKS, MONUMENTS AND OTHER REFERENCE POINTS. REPAIR TO EBMUD STANDARDS ANY BROKEN OR CRACKED SIDEWALK CURB, GUTTER AND SITE UTILITIES DAMAGED BY EARTHWORK OPERATIONS.

3. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT MOVEMENT OR SETTLEMENT OF EXISTING STRUCTURES. PROVIDE AND PLACE BRACING OR SHORING AND BE RESPONSIBLE FOR SAFETY AND SUPPORT OF STRUCTURE. ASSUME LIABILITY FOR SUCH MOVEMENT, SETTLEMENT, DAMAGE, OR INJURY.

4. THE CONTRACTOR SHALL VERIFY AND IDENTIFY ALL UTILITIES, PIPES, DUCTS, CONDUITS AND OTHER SERVICES IN THE PATH OF NEW AND ALTERED WORK. RE-ROUTE ALL SERVICES OR PORTIONS OF SERVICES IN THE PATH OF THE NEW AND ALTERED WORK AND PROVIDE FOR COMPATIBILITY WITH NEW AND ALTERED WORK. WHERE EXISTING WIRE MOLDING, CONDUITS, AND JUNCTION BOXES, ETC., ARE EXPOSED AT EXISTING WALLS OR FURRING, UNLESS OTHERWISE NOTED, WHERE EXISTING LIGHT SWITCHES, CONDUITS AND OUTLETS ARE TO BE RELOCATED, LOCATE INTO LOCATE INTO NEW WALLS, U.O.N. PATCH AND REPAIR FINISHES TO MATCH EXISTING.

5. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS AND ELEVATIONS SHALL ALWAYS TAKE PRECEDENCE OVER SCALED DIMENSIONS. INFORM THE ENGINEER OF ANY DISCREPANCIES.

6. DIMENSIONS SHOWN ON FLOOR PLAN ARE TO FACE OF FINISH OR CONCRETE, UNLESS OTHERWISE NOTED OR INDICATED.

7. VERIFY ALL DIMENSIONS, ELEVATIONS AND LOCATIONS OF NEW CONSTRUCTION WITH EXISTING WALLS, FLOOR, COLUMNS AND FURRING.

8. WHERE INDICATED ON PLANS, ALIGN NEW WALLS WITH THE OUTSIDE FACE OF EXISTING WALLS. COLUMNS AND FURRING FOR A FLUSH CONDITION. REPAIR, PATCH AND FINISH WALLS WHERE ABUTS NEW WALLS.

9. UNLESS SPECIFICALLY NOTED TO BE REMOVED, EXISTING CONSTRUCTION SHALL REMAIN. VERIFY WITH DEMOLITION, PHASING PLANS AND NEW CONSTRUCTION AS INDICATED IN THE DRAWINGS.

10. STRUCTURAL PLANS GOVERN FOR SIZES, SPACING, AND CONNECTIONS OF ALL STRUCTURAL MATERIALS AND MEMBERS. IN CASE OF DISCREPANCIES, CONSULT WITH ENGINEER BEFORE COMMENCEMENT OF WORK

11 ANY ITEM DESCRIBED IN THESE DRAWINGS WITHOUT A "NEW" (N) OR EXISTING (E) DESIGNATION SHALL BE CONSIDERED NEW.

12. EXISTING BUILDING DIMENSIONS, ELEVATIONS, AND CONDITIONS AS SHOWN ON THE (E) PLANS MAY DIFFER. FIELD VERIFY. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF ALL DIMENSIONS AND ELEVATIONS BOTH EXISTING AND NEW. WHERE FIELD CONDITIONS PRECLUDE THE INSTALLATION OF NEW CONSTRUCTION AS INTENDED, I.E. ROUGH-IN PLUMBING, THE CONTRACTOR WILL BE RESPONSIBLE AT NO ADDITIONAL COST TO ENSURE THAT RELATED WORK SEQUENTIAL TO THE DIMENSIONALLY ADJUSTED CONSTRUCTION, I.E. MODULAR CASEWORK, WILL FIT FOR A COMPLETE AND WORKABLE INSTALLATION.

13. PROVIDE BLOCKING AND BACKING FOR ALL WALL-HUNG FIXTURES, ACCESSORIES, GRAB BARS, BUMPER RAILS, SEISMIC RESTRAINTS, ETC. AND AS NOTED IN THE CONSTRUCTION DOCUMENTS.

14. FASTENER ATTACHMENTS ONTO EXISTING CONCRETE AND CMU WALL SURFACES SHALL MEET THE FOLLOWING REQUIREMENTS:

   A. DO NOT DAMAGE EXISTING EMBEDDED REINFORCEMENT BARS

   B. LOCATE EXISTING REINFORCEMENT BARS WITH A PACHOMETER PRIOR TO INSTALLING FASTENERS TO AVOID DAMAGING EXISTING REINFORCEMENT BARS.

   C. VERIFY WITH STRUCTURAL FOR FASTENER TYPE, LOCATION AND DETAILS.

15 FINAL LOCATIONS OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT, PANEL BOARDS, METERS, FIXTURES, FLUES, VENTS, OUTLETS, ECT., SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

16 CONTRACTOR SHALL INFORM THE ENGINEER WHEN MECHANICAL, PLUMBING AND ELECTRICAL ARE READY FOR INSPECTION FOR EACH CONSTRUCTION PHASE BEFORE CLOSING CEILING.

17. UPON COMPLETION OF EACH CONSTRUCTION PHASE, COMPLETELY REBALANCE HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. PROVIDE WRITTEN BALANCING REPORTS TO THE ENGINEER PRIOR TO "FINAL ACCEPTANCE

18 PROJECT AREA SHALL BE THOROUGHLY CLEANED AND MADE READY FOR OCCUPANCY AT END OF EACH CONSTRUCTION PHASE.

19. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY UNKNOWN, CONCEALED, OR UNABATED ASBESTOS ENCOUNTERED DURING EACH DEMOLITION AND CONSTRUCTION PHASE. STOP WORK UNTIL INSTRUCTION IS GIVEN BY EBMUD.

20. NOTHING IN THE DRAWINGS SHALL BE INTERPRETED AS PERMITTING VIOLATION OF APPLICABLE EBMUD DIRECTIVES AND CODES GOVERNING CONSTRUCTION AND, WHERE CONFLICT OCCURS, EBMUD DIRECTIVES SHALL GOVERN, EXCEPT WHERE SUPERIOR CONSTRUCTION WORK IS SPECIFIED OR INDICATED. SUCH CONFLICTS SHALL BE BROUGHT TO EBMUD'S ATTENTION FOR CLARIFICATION, PRIOR TO ANY DEMOLITION AND CONSTRUCTION WORK.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND COORDINATING ALL PENETRATIONS THROUGH NEW AND EXISTING PRESTRESSED PRECAST CONCRETE PLANKS AND GRADE BEAMS WITH THE STRUCTURAL, MECHANICAL, PLUMBING AND ARCHITECTURAL CONSTRUCTION DOCUMENTS.

   X-RAYING OF EXISTING PRESTRESSED PRECAST CONCRETE IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE INCLUDED IN BID.

22. ALL MATERIALS AND EQUIPMENTS SHALL BE NEW AND UNUSED, (UNLESS OTHERWISE NOTED) AND OF HIGH QUALITY IN EVERY RESPECT.

INDEX OF DRAWINGS

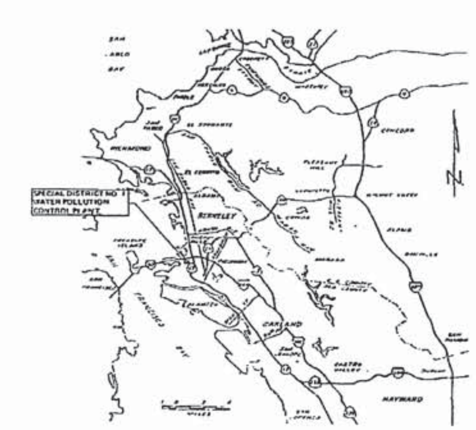
SYMBOL LEGEND

- SECTION CUT NUMBER / DRAWING SHEET NUMBER
- INTERIOR ELEVATION GROUP NUMBER / SPECIFIC ELEVATION / DRAWING SHEET NUMBER
- EXTERIOR ELEVATION NUMBER / DRAWING SHEET NUMBER
- ENLARGED PLAN ELEVATION, OR SECTION NUMBER / AREA ENLARGED / DRAWING SHEET NUMBER
- DETAIL NUMBER / DRAWING SHEET NUMBER
- DOOR MARK / DOOR TYPE LETTER (REFER TO DOOR SCHEDULE) / FRAME NUMBER (REFER TO DOOR SCHEDULE) / HARDWARE GROUP LETTER
- EXISTING COLUMN GRID LINE REFERENCE NUMBER
- NEW COLUMN GRID LINE REFERENCE NUMBER
- WINDOW TYPE
- LOUVER TYPE
- REVISION NUMBER
- PARTITION DETAIL TYPE
- ROOM NUMBER / CEILING FINISH / WALL / WAINSCOT FINISH / FLOOR / BASE FINISH / CEILING HEIGHT
- REVISION NUMBER / ADDENDUM NUMBER
- EQUIPMENT NUMBER SHOWN ON 1/4" FLOOR PLANS. REFER TO SECTION 11000 "EQUIPMENT RESPONSIBILITY" IN SPECIFICATIONS

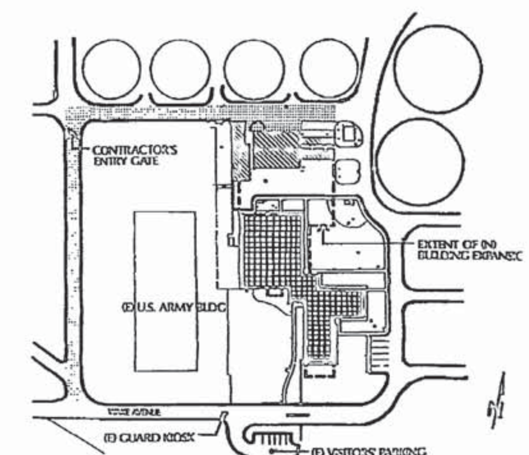
MATERIAL LEGEND

- CONTINUOUS BLOCKING OR SHIM
- BLOCKING OR SHIM
- EARTHWORK
- CONCRETE
- BATT INSULATION
- RIGID INSULATION
- CERAMIC TILE
- METAL
- BRICK TILE PAVER
- CEILING BOARD
- ASPHALT PAVING
- PLYWOOD
- PLASTER/LATH

LOCATION MAP



ACCESS MAP



- CONTRACTOR'S ACCESS ROAD
- (E) EBMUD ADMINISTRATION & LAB BUILDING (2020 WAKE AVENUE, OAKLAND)
- (E) EBMUD OFFICE TRAILERS TO BE REMOVED, U.O.N.

ED2 International
PLANNING
ARCHITECTURE
URBAN DESIGN
INTERIORS

1650 PACIFIC AVENUE
SAN FRANCISCO
CALIFORNIA 94109 2569
415-474-1400

Architect — Reg. No.

EBMUD — LAB EXPANSION PROJECT SD-185

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG. R.P.E. NO. C 23033
EBMUD PROJECT MGR. R.P.E. NO. C 31033
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 37317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 33076

Issuances and Revisions

No.	Date	Description
0	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM NO 1,2,4,5
	1-16-96	22 AUG 1994 AS BUILT

Date 7/29/91

Sheet Title
DRAWING INDEX, GENERAL NOTES, LEGEND. SYMBOLS, LOCATION & ACCESS MAPS

Scale: 3" = 1'-0", U.O.N.

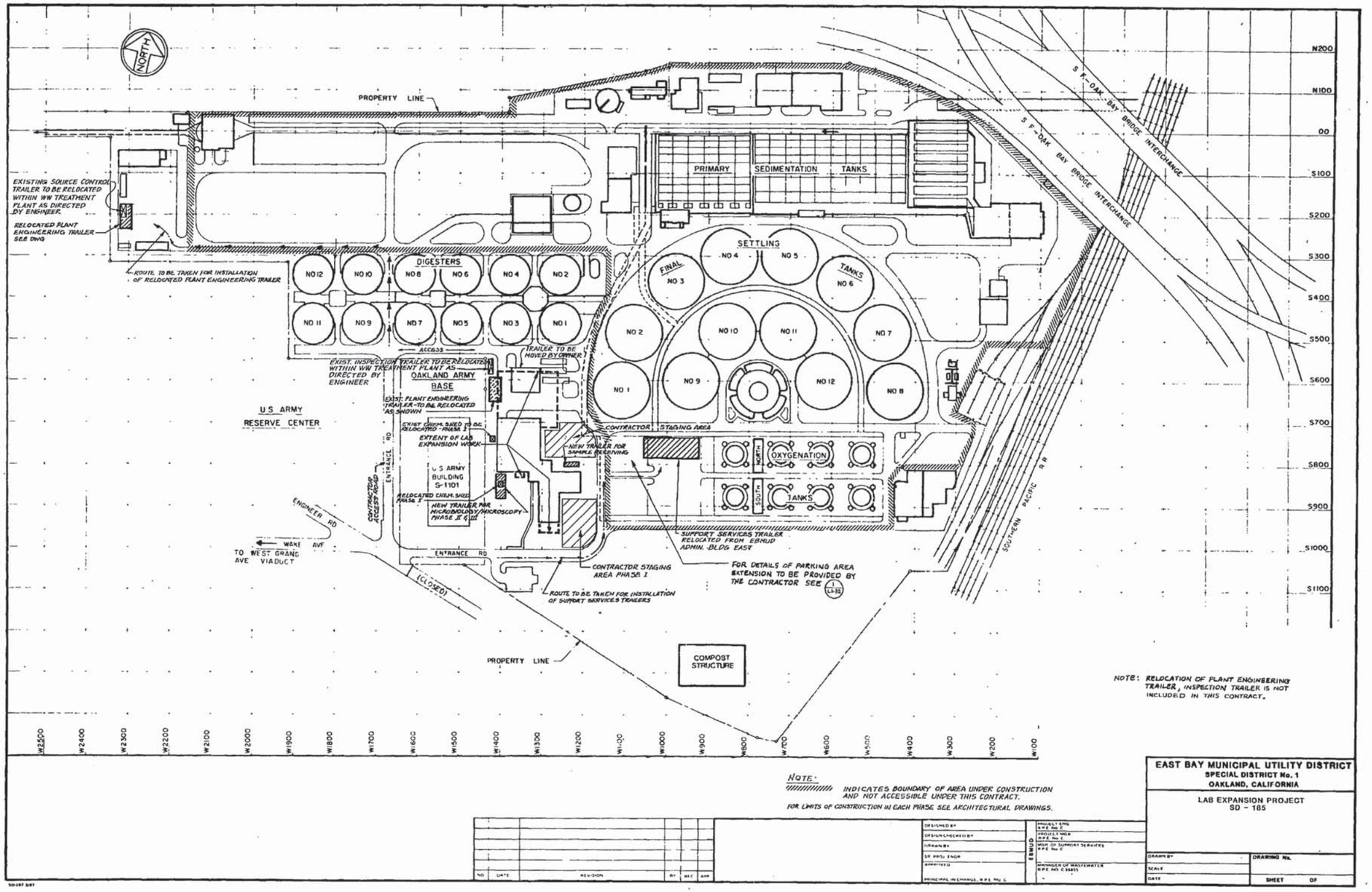
Project No. C002

T1.2 — Revision 0

Sheet No 2/178

USER: RGA
DATE: 1-16-96
FILE: /USR2/SD185/GENERAL/T1.2.DGN

NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT



NOTE: RELOCATION OF PLANT ENGINEERING TRAILER, INSPECTION TRAILER IS NOT INCLUDED IN THIS CONTRACT.

NOTE:
////////// INDICATES BOUNDARY OF AREA UNDER CONSTRUCTION AND NOT ACCESSIBLE UNDER THIS CONTRACT.
FOR LIMITS OF CONSTRUCTION IN EACH PHASE SEE ARCHITECTURAL DRAWINGS.

NO	DATE	REVISION	BY	CHK	APP

DESIGNED BY
DESIGN CHECKED BY
DRAWN BY
SR PROJ ENGR
APPROVED
PRINCIPAL IN CHARGE, R.P.E. No. C

EBMUD
PROJECT ENG. R.P.E. NO. C
PROJECT MGR. R.P.E. No.
MGR OF SUPPORT SERVICES R.P.E. No. C
MANAGER OF WASTEWATER R.P.E. NO. C 39455

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

LAB EXPANSION PROJECT
SD - 185

DRAWN BY
SCALE
DATE
DRAWING No.
SHEET OF

THIS DRAWING IS MADE AVAILABLE FOR THE CONTRACTOR'S INFORMATION ONLY. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR ITS ACCURACY. THE CONTRACTOR SHALL VERIFY ALL UTILITIES AND DIMENSIONS IN THE FIELD.

USER: RW
DATE: 5-22-95
FILE: /usr2/eby/sd185/c12.dgn

ED2 International
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ARCHITECTURE
URBAN DESIGN
INTERIORS

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Architect Reg No.

EBMUD

LAB EXPANSION PROJECT SD-185

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG. R.P.E. NO. C 39959

EBMUD PROJECT MGR. R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33311

EBMUD MGR. OF WASTEWATER R.P.E. NO. C 39976

REGISTERED PROFESSIONAL ENGINEER No. C 31455 12/31/92 CIVIL STATE OF CALIFORNIA

Issuances and Revisions

No.	Date	Description
1	1/29/92	ISSUE FOR CONSTRUCTION 5
	5-22-95	AS NOT 1994 AS BUILT REP. P.Y.L.

Date 7/29/91

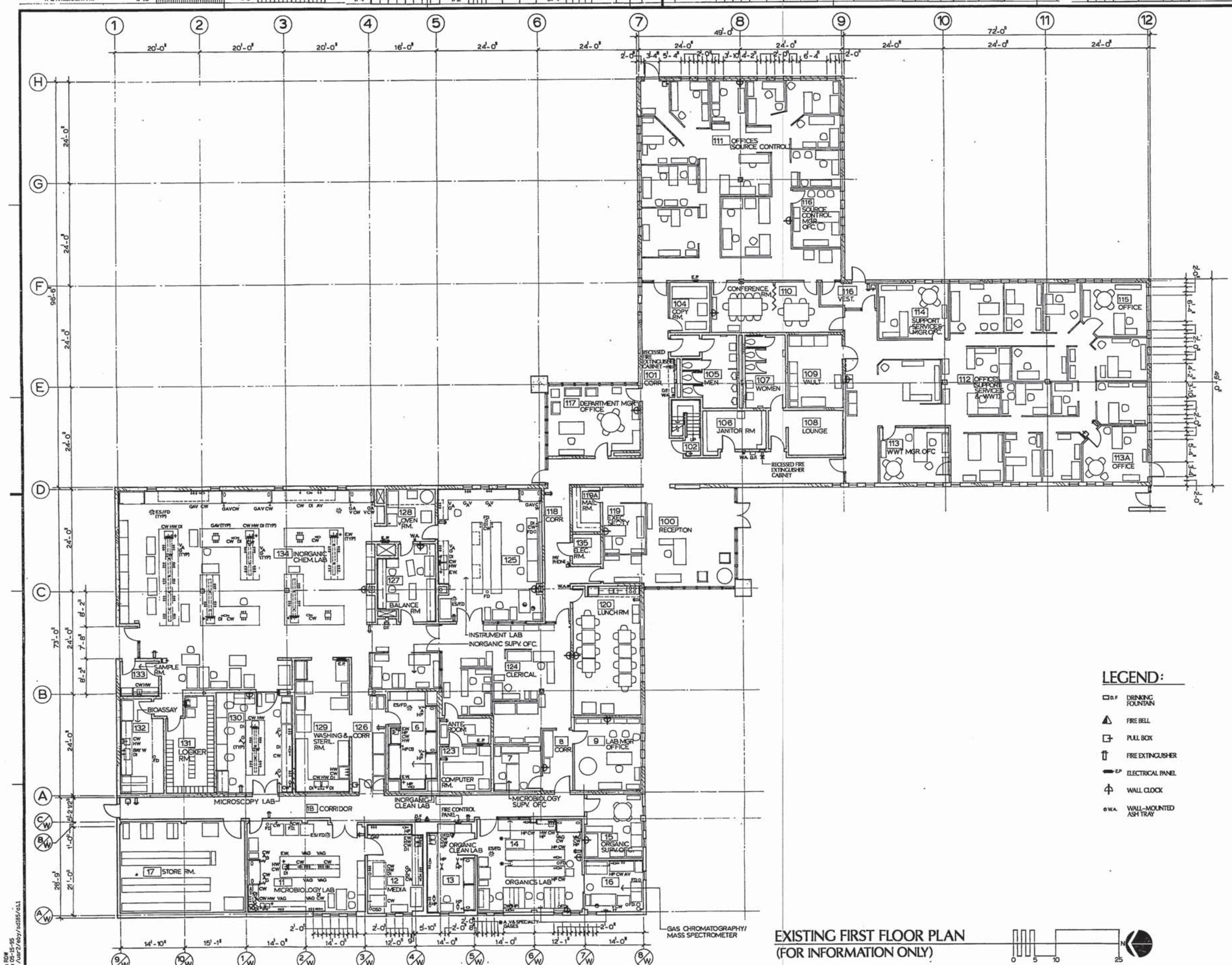
Sheet Title

SITE MAP

Project No. 9002

C1.2 | 0

Sheet No. 4/118 | Revision



EXISTING FIRST FLOOR PLAN
(FOR INFORMATION ONLY)

ED2 International

PLANNING
ARCHITECTURE
URBAN DESIGN
INTERIORS

1660 PACIFIC AVENUE
SAN FRANCISCO
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415·474·1400

Architect — Reg. No.

EBMUD — LAB EXPANSION PROJECT SD-185

EAST BAY
MUNICIPAL
UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG.
EBMUD PROJECT MGR.
EBMUD MGR. OF SUPPORT SERVICES
EBMUD MGR. OF WASTEWATER

NELLIE INGRAHAM ASSOCIATES
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Engineer — Reg. No.

Issuances and Revisions

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1	1-15-96	ISSUED FOR CONSTRUCTION
	5-15-95	AS BUILT

Date 7/29/91

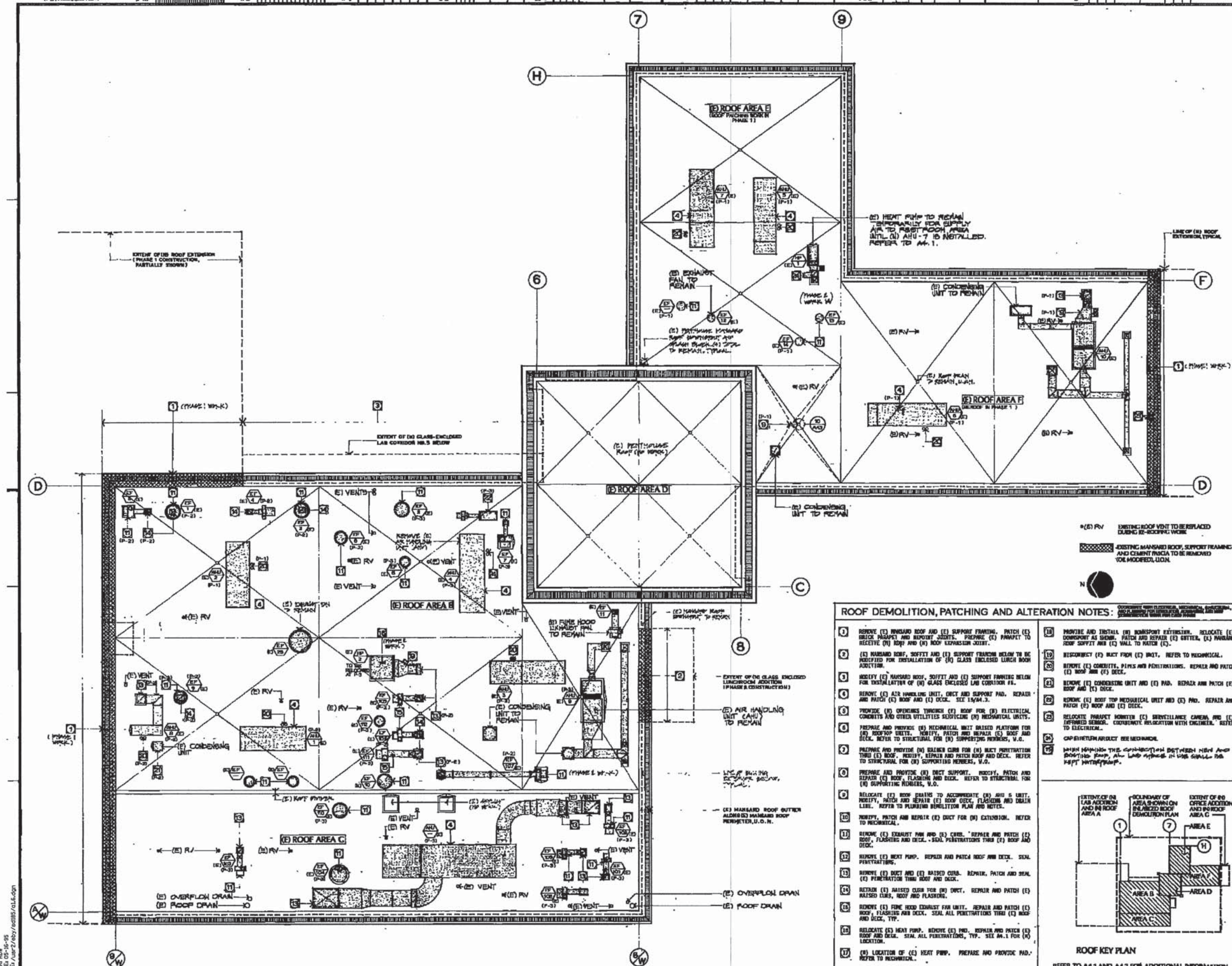
Sheet Title
EXISTING
FIRST FLOOR PLAN

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

Project No. 8901

A1.1 — Revision 0

Sheet No. 13/178



ROOF DEMOLITION, PATCHING AND ALTERATION NOTES:

1. REMOVE (E) MANSARD ROOF AND (E) SUPPORT FRAMING. PATCH (E) BRICK PARAPET AND REPOINT JOINTS. PREPARE (E) PARAPET TO RECEIVE (N) ROOF AND (N) ROOF EXPANSION JOINT.
2. (E) MANSARD ROOF, SOFFIT AND (E) SUPPORT FRAMING BELOW TO BE MODIFIED FOR INSTALLATION OF (N) GLASS ENCLOSED LUNCH ROOM ADDITION.
3. MODIFY (E) MANSARD ROOF, SOFFIT AND (E) SUPPORT FRAMING BELOW FOR INSTALLATION OF (N) GLASS ENCLOSED LAB CORRIDOR #5.
4. REMOVE (E) AIR HANDLING UNIT, DUCT AND SUPPORT PAD. REPAIR AND PATCH (E) ROOF AND (E) DECK. SEE 15/A4.3.
5. PROVIDE (N) OPENINGS THROUGH (E) ROOF FOR (N) ELECTRICAL CONDUITS AND OTHER UTILITIES SERVICING (N) MECHANICAL UNITS.
6. PREPARE AND PROVIDE (N) MECHANICAL UNIT RAISED PLATFORM FOR (N) ROOFTOP UNITS. MODIFY, PATCH AND REPAIR (E) ROOF AND DECK. REFER TO STRUCTURAL FOR (N) SUPPORTING MEMBERS, V.O.
7. PREPARE AND PROVIDE (N) RAISED CURB FOR (N) DUCT PENETRATION THRU (E) ROOF. MODIFY, REPAIR AND PATCH ROOF AND DECK. REFER TO STRUCTURAL FOR (N) SUPPORTING MEMBERS, V.O.
8. PREPARE AND PROVIDE (N) DUCT SUPPORT. MODIFY, PATCH AND REPAIR (E) ROOF, FLASHING AND DECK. REFER TO STRUCTURAL FOR (N) SUPPORTING MEMBERS, V.O.
9. RELOCATE (E) ROOF DRAINS TO ACCOMMODATE (N) AHU 6 UNIT. MODIFY, PATCH AND REPAIR (E) ROOF DECK, FLASHING AND DRAIN LINE. REFER TO PLUMBING DEMOLITION PLAN AND NOTES.
10. MODIFY, PATCH AND REPAIR (E) DUCT FOR (N) EXTENSION. REFER TO MECHANICAL.
11. REMOVE (E) EXHAUST FAN AND (E) CURB. REPAIR AND PATCH (E) ROOF, FLASHING AND DECK. SEAL PENETRATIONS THRU (E) ROOF AND DECK.
12. REMOVE (E) HEAT PUMP. REPAIR AND PATCH ROOF AND DECK. SEAL PENETRATIONS.
13. REMOVE (E) DUCT AND (E) RAISED CURB. REPAIR, PATCH AND SEAL (E) PENETRATION THRU ROOF AND DECK.
14. RETAIN (E) RAISED CURB FOR (N) DUCT. REPAIR AND PATCH (E) RAISED CURB, ROOF AND FLASHING.
15. REMOVE (E) FUME HOOD EXHAUST FAN UNIT. REPAIR AND PATCH (E) ROOF, FLASHING AND DECK. SEAL ALL PENETRATIONS THRU (E) ROOF AND DECK, TYP.
16. RELOCATE (E) HEAT PUMP. REMOVE (E) PAD. REPAIR AND PATCH (E) ROOF AND DECK. SEAL ALL PENETRATIONS, TYP. SEE A4.1 FOR (N) LOCATION.
17. (N) LOCATION OF (E) HEAT PUMP. PREPARE AND PROVIDE PAD. REFER TO MECHANICAL.
18. PROVIDE AND INSTALL (N) DOWNSPOUT EXTENSION. RELOCATE (E) DOWNSPOUT AS SHOWN. PATCH AND REPAIR (E) GUTTER, (E) MANSARD ROOF SOFFIT AND (E) WALL TO MATCH (E).
19. DISCONNECT (E) DUCT FROM (E) UNIT. REFER TO MECHANICAL.
20. REMOVE (E) CONDUITS, PIPES AND PENETRATIONS. REPAIR AND PATCH (E) ROOF AND (E) DECK.
21. REMOVE (E) CONDENSING UNIT AND (E) PAD. REPAIR AND PATCH (E) ROOF AND (E) DECK.
22. REMOVE (E) ROOF TOP MECHANICAL UNIT AND (E) PAD. REPAIR AND PATCH (E) ROOF AND (E) DECK.
23. RELOCATE PARAPET MOUNTED (E) SURVEILLANCE CAMERA AND (E) INFRARED SENSOR. COORDINATE RELOCATION WITH ENGINEER. REFER TO ELECTRICAL.
24. CAP (E) RETURN AIR DUCT. SEE MECHANICAL.
25. WHEN MAKING THE CONNECTION BETWEEN NEW AND EXISTING ROOF, ALL LAB SPACE IN USE SHALL BE KEPT WATERPROOF.

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EBMUD LAB EXPANSION PROJECT SD-165

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG. R.P.E. NO. C 39459
EBMUD PROJECT MGR. R.P.E. NO. C 31965
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33017
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 38076

Issuances and Revisions

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Date 7/29/91
Sheet Title
ROOF DEMOLITION PLAN

SCALE 1/8"=1'-0"
Project No. 9002

A1.6 — Revision 0
Sheet No. 15/178

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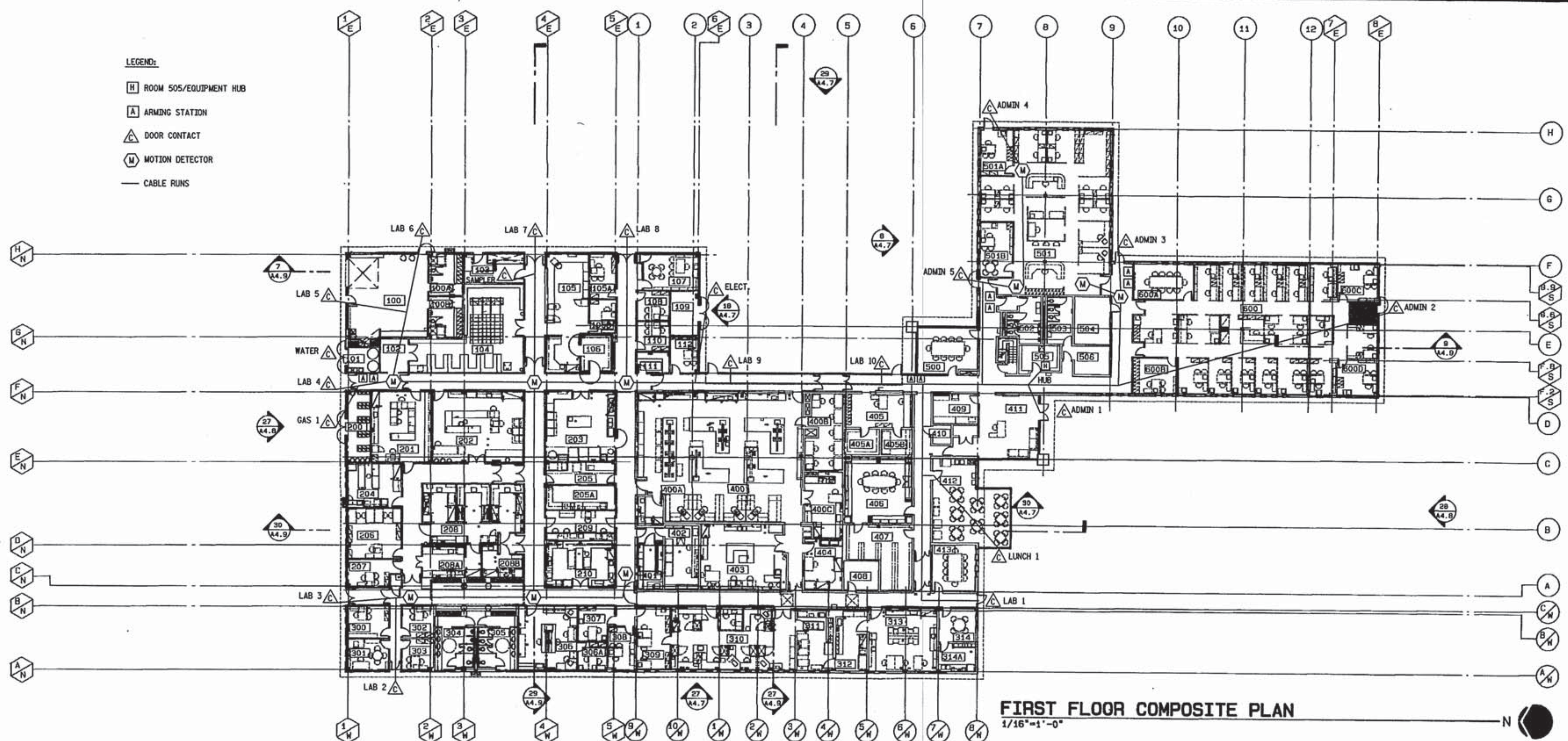

FIRST FLOOR COMPOSITE PLAN

1/16"=1'-0"

ROOM NO.	ROOM NAME	NOTES
100	FIELD SERVICES	(N) NORTH WING LAB ADDITION
100A	MEN'S LOCKER/RESTROOM	" "
100B	WOMEN'S LOCKER/RESTROOM	" "
101	D.I.	" "
102	SHIPPING/RECEIVING AREA	" "
103	SAMPLE NIGHT DROP	" "
104	STORE ROOM	" "
105	SAMPLE RECEIVING	" "
105A	INORG. SUPERVISOR	" "
105B	MICRO. ASSISTANT	" "
106	COLD ROOM	" "
107	LAB MANAGER	" "
108	INORG. ASST. SUPERVISOR	" "
109	ELECTRICAL ROOM	" "
110	INORG. ASST. SUPERVISOR	" "
111	INSTRUMENT REPAIR SHOP	" "
112	SHARED OFFICE	" "
200	GAS CYLINDER STORAGE ROOM	" "
201	GENERAL CHEMISTRY	" "
202	L.C./M.S & G.C./M.S.	" "
203	GLASS WASH	" "
204	V.O.A.	" "
205	OVEN ROOM	" "
205A	BALANCE	" "
206	ORGANIC OPEN OFFICE	" "
207	ORGANIC RES. OFFICE	" "
208	SAMPLE CON. & CLEAN	" "
208A	CLSA	" "
208B	HAZARDOUS MATERIALS	" "
209	SPECTROSCOPY	" "
210	LIQUID INSTRUMENT	" "
300	SUPERVISOR'S OFFICE	" "
301	SUPERVISOR'S OFFICE	" "
302	SUPERVISOR'S OFFICE	" "
303	SUPERVISOR'S OFFICE	" "
304	MEN'S RESTROOM	" "
305	WOMEN'S RESTROOM	" "
306	TOXICOLOLOGY	" "
306A	AQUATIC TOXICOLOGY	" "
307	SUPERVISOR'S OFFICE	" "

ROOM NO.	ROOM NAME	NOTES
308	MICROBIOLOGY SUPERVISOR'S OFFICE	
309	MICROBIOLOGY OPEN OFFICE	PART OF (E) STORE ROOM
310	MICROBIOLOGY	PART OF (E) STORE ROOM
311	MEDIA KITCHEN	
312	CLEAN ROOM	
313	MICROSCOPY	(E) ORGANICS LAB
314	E.M. (FLAVOR PROFILE)	(E) ORGANIC SUPERVISOR'S OFFICE
314A	E.M. (FLAVOR PROFILE)	(E) GAS CHROMATOGRAPHY / MASS SPECTROMETER
400	INORG. CHEM. LAB.	
400A	RADIOLOGICAL LAB	(E) SAMPLE ROOM
400B	INORG. OPEN OFFICE	(E) OVEN AND BALANCE ROOMS
400C	INSTRUMENT LAB	PART OF (E) INORG. SUPV. OFFICE AND (E) BALANCE RM.
401	BIOASSAY (ANTE ROOM)	
402	BIOASSAY (MAIN ROOM)	(E) LOCKER ROOM
403	ICP ICP/MS	(E) MICROSCOPY LAB & (E) WASHING & STERILIZING ROOM
404	PREPARATION LAB	(E) INORGANIC CLEAN LAB
405	CLERICAL LAB	PART OF (E) INSTRUMENT LAB
405A	STORAGE (CLERICAL)	PART OF (E) INSTRUMENT LAB
405B	COPY (CLERICAL)	PART OF (E) INSTRUMENT LAB
406	LIBRARY	(E) CLERICAL AND LAB CORRIDOR
407	ARCHIVES/STORAGE	(E) COMPUTER ANTE RM., MICROBIOLOGY SUPV. AND CLERICAL
408	COMPUTER ROOM	
409	MAIL/FAX	(E) MAIL ROOM AND EXECUTIVE SECRETARY STATION
410	ELECTRICAL ROOM	
411	RECEPTION/WAITING	
411A	STORAGE (AT RECEPTION/WAITING AREA)	NEW
412	LUNCH ROOM	(N) ADDITION ADDED
413	CONFERENCE ROOM (COMMON)	(E) LAB MANAGER'S OFFICE
500	CONFERENCE ROOM (EAST OFFICE WING)	(E) WWT MANAGER'S OFFICE
501	OPEN OFFICE (EAST WING)	PART OF (E) SOURCE CONTROL OFFICES
501A	FIELD SERVICES SUPERVISOR	PART OF (E) SOURCE CONTROL OFFICES
501B	WWT. MANAGER	PART OF (E) SOURCE CONTROL OFFICES
502	MEN'S RESTROOM	
503	WOMEN'S RESTROOM	
504	VAULT	
505	JANITOR	
506	LOUNGE	DOOR MODIFICATIONS FOR HANDICAP ACCESS
600	FIELD OFFICES	(E) SUPPORT SERVICES & WWT OFFICES
600A	CONFERENCE ROOM (SOUTH OFFICE WING)	(E) SUPPORT SERVICES MGR. OFFICE
600B	MCP SUPERVISOR	(E) WWT MANAGER'S OFFICE
600C	SUPV. CONSTRUCTION INSPECTION	(N) SOUTH WING OFFICE ADDITION
600D	PE. WCP.	(N) SOUTH WING OFFICE ADDITION

USER: RDW
DATE: 7-19-95
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EBMUD PROJECT MGR.
R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES
R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER
R.P.E. NO. C 30976

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Sheet Title
FIRST FLOOR
COMPOSITE PLAN

Scale: 1/16" = 1'-0"

Project No. 9002

A2.1 — Revision 0

Sheet No. 19/178

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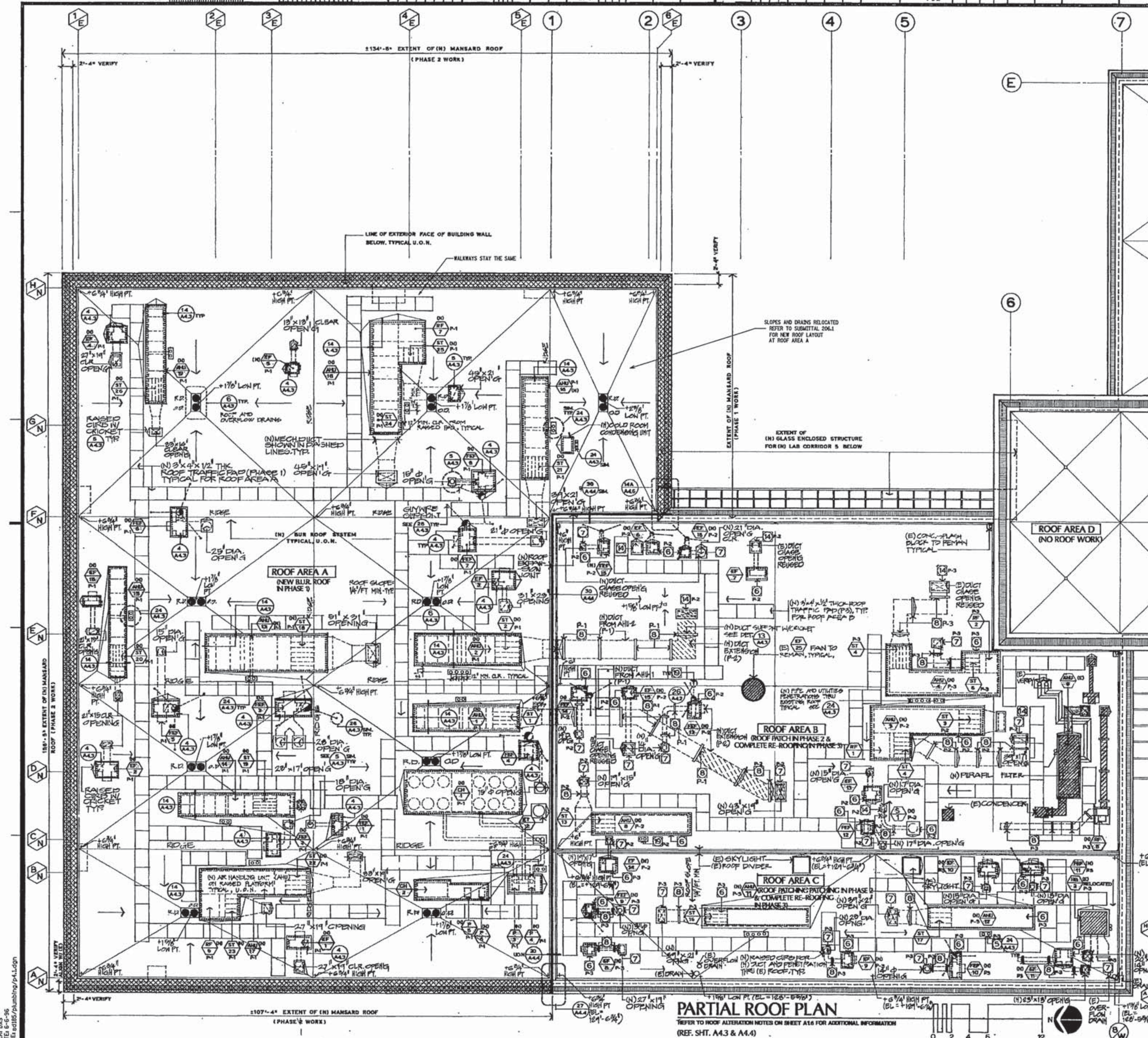

ROOF NOTES

1. THE CONTRACTOR IS CAUTIONED THAT THIS PROJECT INVOLVES PHASING OF ROOF WORK, AS WELL AS, DEMOLITION, ALTERATION, PATCHING AND RE-ROOFING OF EXISTING BUILT-UP BITUMINOUS ROOF (B.U.R.) AND EXISTING MANSARD METAL ROOF AS NOTED IN THE CONSTRUCTION DOCUMENTS.
2. WORK WHICH IS REQUIRED TO BE PERFORMED TO PROVIDE A COMPLETELY WATERPROOF AND OPERABLE ROOF INSTALLATION WITHIN THIS SCOPE OF WORK, BUT WHICH IS NOT SPECIFICALLY INCLUDED IN THE DRAWINGS, SHALL BE PERFORMED AS PART OF THE CONTRACT AND INCLUDED IN THE BID.
3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING, LOCATING AND VERIFYING THE SIZES OF ALL NEW PENETRATIONS THROUGH EXISTING AND NEW ROOFS FOR DUCT, PIPING AND OTHER UTILITY RUNS WITH THE STRUCTURAL, MECHANICAL, ELECTRICAL PLUMBING AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL ADJUSTMENTS IN DIMENSIONS, OPENING SIZES, LOCATIONS, STRUCTURAL SUPPORTS, ETC. OF ALL SUBSTITUTE ROOF-MOUNTED MECHANICAL EQUIPMENT, SYSTEM AND ANY OTHER WORK WHICH AFFECT THE PROPER INSTALLATION AND OPERATION OF SUBSTITUTED ITEMS.
5. MINIMUM THICKNESS OF ROOF INSULATION BOARD AT ROOF DRAINS ARE MEASURED FROM TOP OF CONCRETE FILLED METAL DECKING. TOP OF CONCRETE FILLED METAL DECKING IS +0". (EL = 127'-10" VERIFY), TYP. (ROOF AREA C TOP OF CONC. DECK VARIES).
6. ALL ARROWS ON ROOFS ARE INDICATING THE DIRECT OF SLOPE OF ROOF OR CRICKET FROM HIGH POINT TO THE LOW POINT.
7. ROOF INSULATION BOARD SYSTEM SHALL PROVIDE A MINIMUM THERMAL RESISTANCE OF R15.7.
8. REFER TO ROOF ALTERATION NOTES ON SHEET A1.6 FOR ADDITIONAL ROOFING WORK REQUIREMENTS. SEE ROOF PHASING NOTES ON SHEET A4.2.
9. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT ALL CONSTRUCTION TRADES FROM DAMAGING THE ROOFS DURING AND AFTER EACH CONSTRUCTION PHASES. PROTECT (E) ROOF-TOP MOUNTED EQUIPMENTS, UTILITY LINES AND DUCTS DURING EACH DEMOLITION AND CONSTRUCTION WORK PHASE. PROVIDE TEMPORARY PROTECTIVE TRAFFIC PAD ON ROOF UNTIL (N) PADS ARE INSTALLED.
10. STRUCTURAL REINFORCEMENT OF (E) ROOF STRUCTURAL MEMBERS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF (N) MECHANICAL EQUIPMENT AND PAD. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND SCHEDULING.
11. PROVIDE 18" MINIMUM CLEARANCE BETWEEN DRAINS, AND PIPES, AND 24" MINIMUM FROM WALLS, PARAPETS AND CURBS WHEREVER THEY OCCUR SO THAT PROPER FLASHING OF ALL PENETRATIONS CAN BE ACCOMPLISHED.
12. VERIFY THAT ALL REUSED (E) DUCT CHASE OPENINGS ARE ADEQUATE FOR (N) DUCTS. INFORM ENGINEER OF SPACE CONSTRAINT PRIOR TO COMMENCEMENT OF WORK.

(N) DUCT EXTENSION WORK IN P-2

P1 - PHASE 1 WORK
P2 - PHASE 2 WORK
P3 - PHASE 3 WORK

(N) RAISED PLATFORM FOR (N) MECHANICAL UNITS. PLATFORM SIZE AND CONFIGURATION VARY

EXISTING ROOFTOP MECHANICAL UNITS TO REMAIN

EXISTING ROOFTOP MECHANICAL UNITS RELOCATED

(N) PARAPET, MANSARD ROOF, FRAMING, CEM. PLASTER FASCIA AND SOFFIT, TYPICAL U.O.N. (N) MANSARD ROOF SHALL MATCH W/ (E) IN PROFILE, FINISH, COLOR, DIMENSIONS AND ELEVATIONS, U.O.N.

NEW ROOF EXPANSION JOINT COVER (PHASE 1 WORK)

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EBMUD — LAB EXPANSION PROJECT SD-185

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EBMUD PROJECT MGR. R.P.E. NO. C 31060
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

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Sheet Title
PARTIAL ROOF PLAN
& ROOF NOTES

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

Project No. 9002

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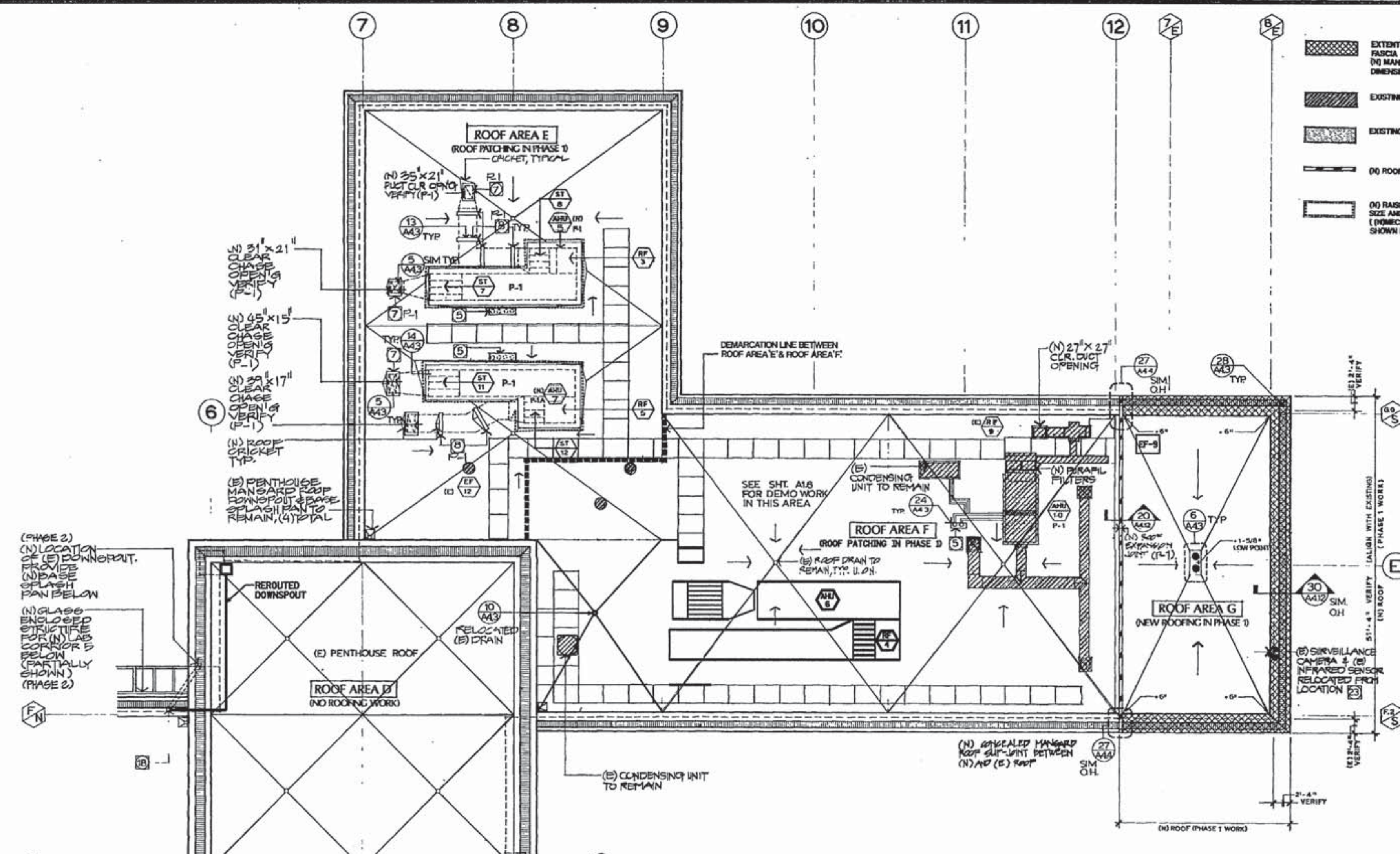
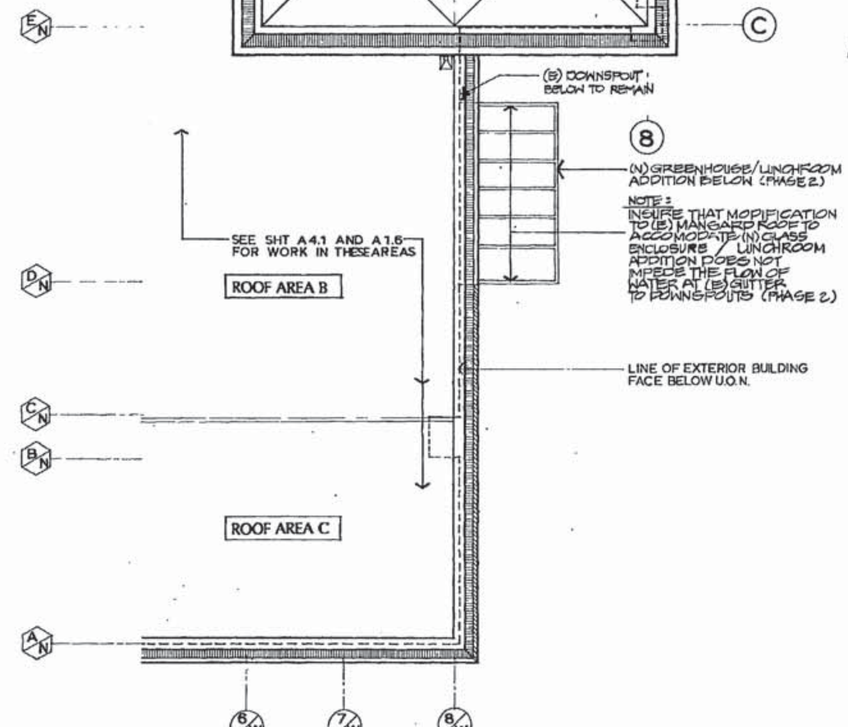




EXTENT OF (N) PARAPET MANSARD ROOF FRAMING, CEM. PLASTER FASCIA AND SOFFIT, TYPICAL U.O.N. (N) MANSARD SHALL MATCH W/ (E) IN PROFILE FINISH, COLOR, DIMENSIONS AND ELEVATION, U.O.N.

EXISTING ROOF TOP MECHANICAL UNITS TO REMAIN

EXISTING ROOF TOP MECHANICAL UNITS TO BE RELOCATED

(N) ROOF EXPANSION JOINT

(N) RAISED PLATFORM FOR (N) MECHANICAL UNITS. SIZE AND CONFIGURATION OF PLATFORM VARY (MECHANICAL UNITS, EQUIPMENT AND DUCT SHOWN IN DASHED LINES, TYPICAL)

ROOF PHASING NOTES* (REFER TO A16 FOR KEY NOTES ON ROOF PLAN)

THE ROOF PHASING NOTES AND ROOF PLANS ARE SUPPLIED FOR INFORMATIONAL PURPOSE ONLY. CONTRACTOR SHALL USE THEM AS GUIDES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS OF THE ROOFS, THE PROPOSED NEW ROOFS, AND PHASING BEFORE BIDDING THE JOB. ANY UNUSUAL AND SUBSTANTIAL WORK THAT IS NOT COVERED IN THE CONSTRUCTION DOCUMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER BEFORE SUBMITTING BID. FOR EXTENT OF ALL PHASING AND WORK, WHICH MAY NOT BE SHOWN ON THE ARCHITECTURAL DRAWINGS, SEE MECHANICAL, PLUMBING, STRUCTURAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR TOTAL COORDINATION OF WORK.

I. PHASE 1 ROOF WORK

PHASE 1 ROOF WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED:

I.A) REMOVE EXISTING MANSARD ROOF AND SOFFIT/FASICA TO ACCOMMODATE NEW NORTH WING LABORATORY ADDITION (ROOF AREA "A") AND NEW SOUTH WING OFFICE ADDITION (ROOF AREA "G"). REPLACE (E) PARAPET WALL COPING WITH (N).

I.B) INSTALL (N) ROOF EXPANSION JOINT AT (N) NORTH WING LABORATORY ADDITION AND AT (N) SOUTH WING OFFICE ADDITION.

I.C) INSTALL (N) BUILT-UP BITUMINOUS ROOF (B.U.R.), (N) MANSARD ROOF AND SOFFIT/FASCIA AND (N) DOWNSPOUTS AND GUTTERS IN ROOF AREA "A" AND ROOF AREA "G" AFTER THE COMPLETION OF ALL MECHANICAL, ELECTRICAL AND PLUMBING ROOF WORK ON ROOF AREA "A" AND ROOF AREA "G".

I.D) INSTALL (N) MECHANICAL PADS, RAISED CURBS AND FLASHED ROOF PENETRATIONS ON ROOF AREA "E" AND "F" FOR (N) ROOF-MOUNTED MECHANICAL EQUIPMENT, DUCTS, UTILITY RUNS, ETC.

I.E) INSTALL (N) ROOF TRAFFIC PADS ON (N) ROOF AREA "A" AS SHOWN.

I.F) INSTALL (N) DUCTS AND DUCT SUPPGRTS AND AT (E) ROOF AREA "B" FROM (N) AIR HANDLING UNITS AHU-1 AND AHU-2.

I.G) REMOVE (E) MECHANICAL EQUIPMENT, SUPPORT PADS, RAISED CURBS, DUCTS, DUCT SUPPORTS AND UTILITY RUNS IN (E) ROOF AREAS "E" AND "F" WHERE INDICATED. PATCH AND REPAIR (E) METAL DECK, (E) ROOF LIGHT WEIGHT CONCRETE, (E) ROOF INSULATION AND (E) ROOF AREAS "E" AND "F".

I.H) RELOCATE (E) ROOF DRAIN AT (E) ROOF AREA "F" NEAR (N) MECHANICAL UNIT AHU-5. ADJUST (E) ROOF SLOPE. PATCH AND REPAIR (E) METAL DECK, (E) ROOF INSULATION AND (E) ROOF.

I.J) REMOVE (E) ROOF IN AREA "F". AFTER ALL MECHANICAL, PLUMBING AND ELECTRICAL ROOF WORK ARE COMPLETED. REPAIR AND PATCH (E) DECK AND INSULATION. REROOF ENTIRE ROOF AREA "F".

I.K) INSTALL (N) ROOF TRAFFIC PADS WHERE OCCURS.

II. PHASE 2 ROOF WORK

PHASE 2 ROOF WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED:

II.A) REMOVE (E) ROOF-MOUNTED MECHANICAL EQUIPMENT, SUPPORT PADS, DUCTS, TRAFFIC PADS AND UTILITY LINES NO LONGER IN USE. PATCH AND REPAIR (E) CONCRETE FILLED METAL DECK, ROOF INSULATION AND B.U.R. ROOF IN ROOF AREA "B".

II.B) INSTALL (N) ROOF PENETRATIONS THROUGH (E) ROOF AREA "B" FOR (N) DUCTS FROM AIR HANDLING UNITS AHU-1 AND AHU-2. PROVIDE AND INSTALL (N) DUCT EXTENSIONS AND (N) DUCT SUPPORTS SERVING AHU-1 AND AHU-2.

II.C) INSTALL (N) MECHANICAL EQUIPMENT PADS, RAISED CURBS, DUCT SUPPORTS, AND FLASHED ROOF PENETRATIONS THROUGH/ON (E) ROOF AREAS "B" AND "C" FOR (N) EQUIPMENT, DUCTS, UTILITY RUNS, ETC.

II.D) EXTEND (E) DUCTS, UTILITY LINES, ETC. AS INDICATED IN THE MECHANICAL, PLUMBING AND ELECTRICAL. PROVIDE (N) DUCT AND UTILITY LINE SUPPORTS AS SHOWN.

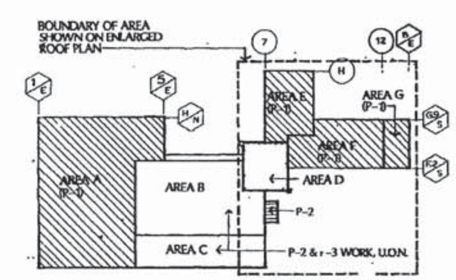
III. PHASE 3 ROOF WORK

III.A) SAME AS REQUIREMENTS STATED IN II.A), II.C) AND II.D) OF PHASE 2 ROOF WORK ABOVE.

III.B) AFTER THE COMPLETION OF ALL (N) MECHANICAL EQUIPMENT, SUPPORT PADS, UTILITY RUNS, AND FLASHED PENETRATIONS INSTALLATIONS, (E) ROOF AREAS "B" AND "C" SHALL BE RE-ROOFED.

III.C) INSTALL (N) TRAFFIC PADS AS SHOWN.

*ROOF PHASING PLAN MAY NOT NECESSARILY CORRESPOND TO FLOOR PLAN PHASING, DEMOLITION & ALTERATION PLANS AS INDICATED ON SHEETS A1.2, A1.3, A1.4 & A1.5. REFER TO MECHANICAL, STRUCTURAL, ELECTRICAL & PLUMBING ROOFING DEMOLITION, PHASING, PLANS AND SPECIFICATIONS FOR TOTAL COORDINATION OF ROOF WORK.



ROOF PHASING & KEY PLAN *

PARTIAL ROOF PLAN

REFER TO ROOF ALTERATION NOTES ON SHEET A1.6 AND A4.2 FOR ADDITIONAL INFORMATION

(REF. SHT. A4.3 & A4.4)

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EBMUD LAB EXPANSION PROJECT SD-185

EAST BAY MUNICIPAL UTILITY DISTRICT
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EBMUD PROJECT MGR. R.P.E. NO. C 31966
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317
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PARTIAL ROOF PLAN & ROOF PHASING NOTES

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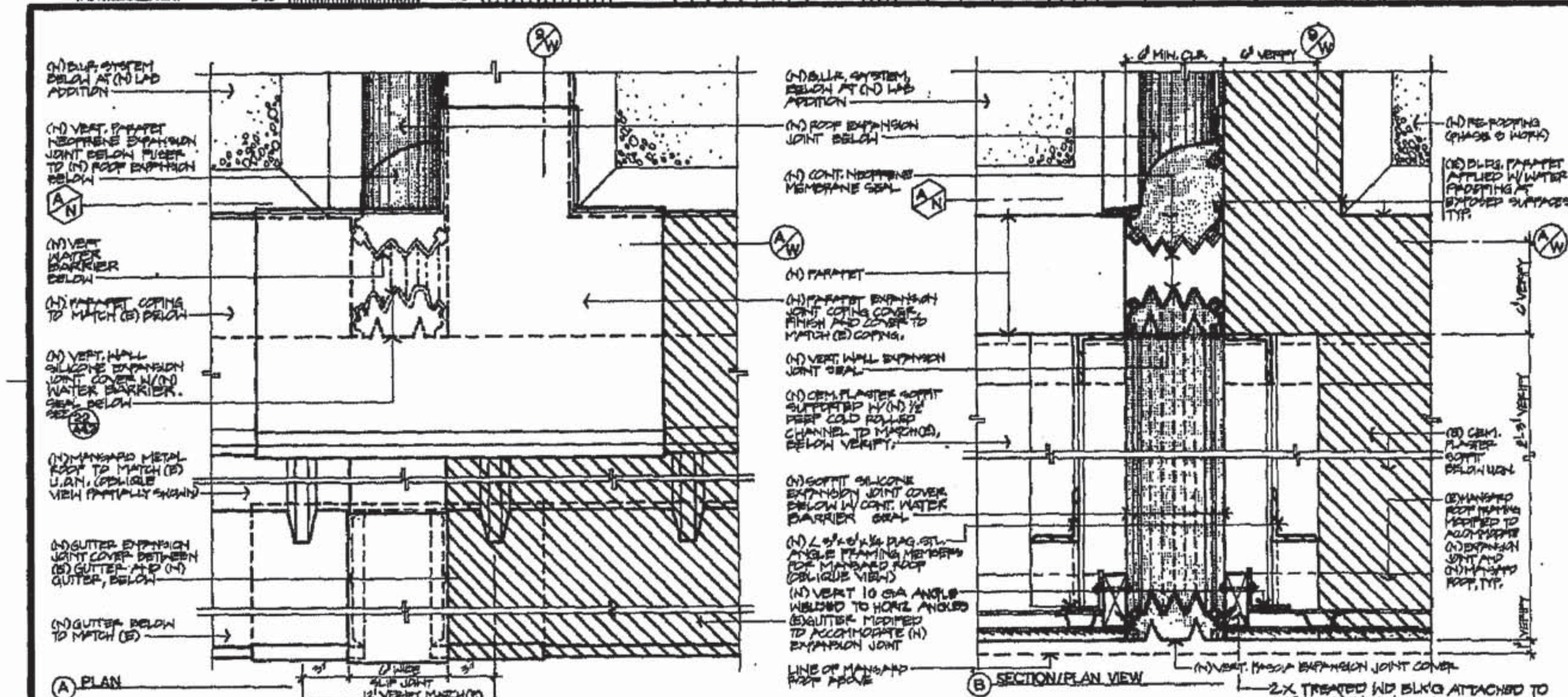
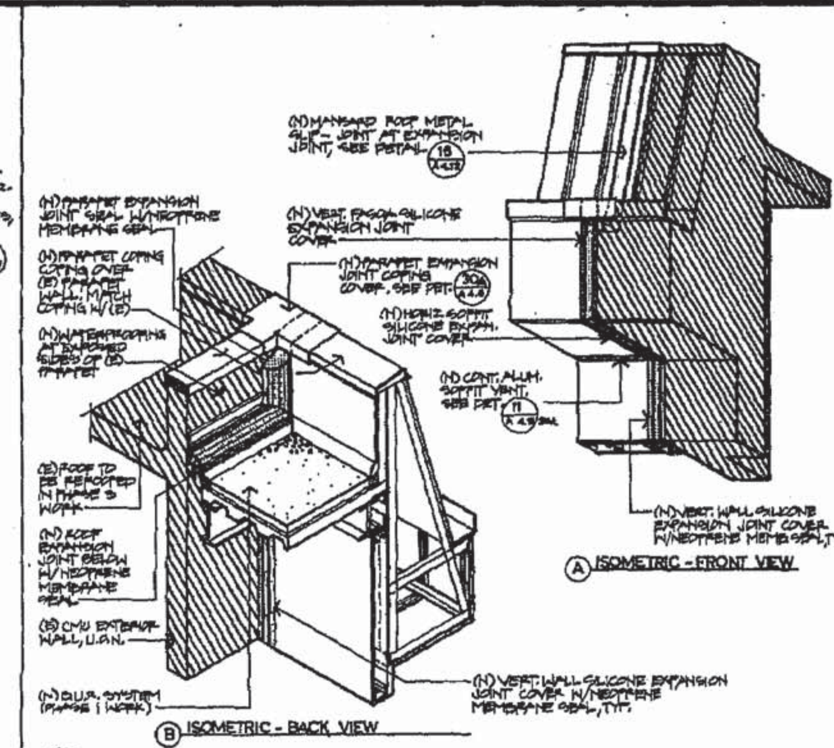
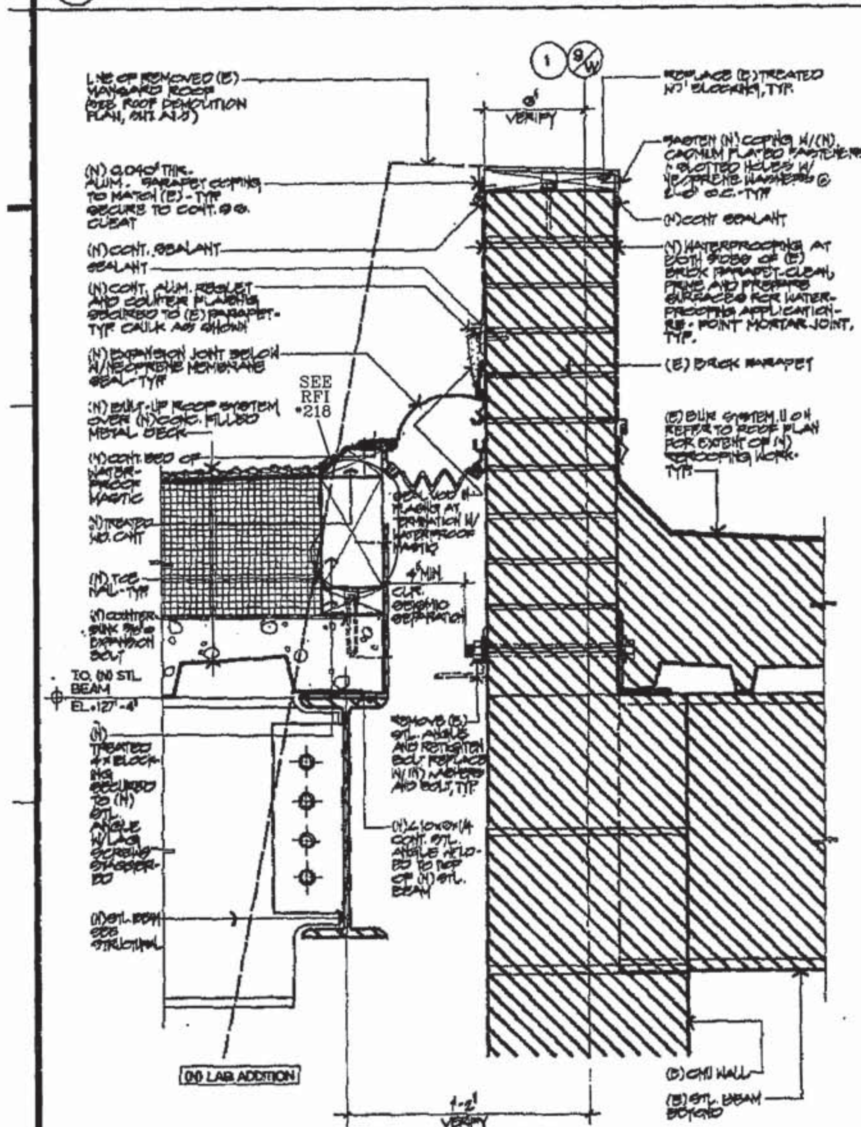


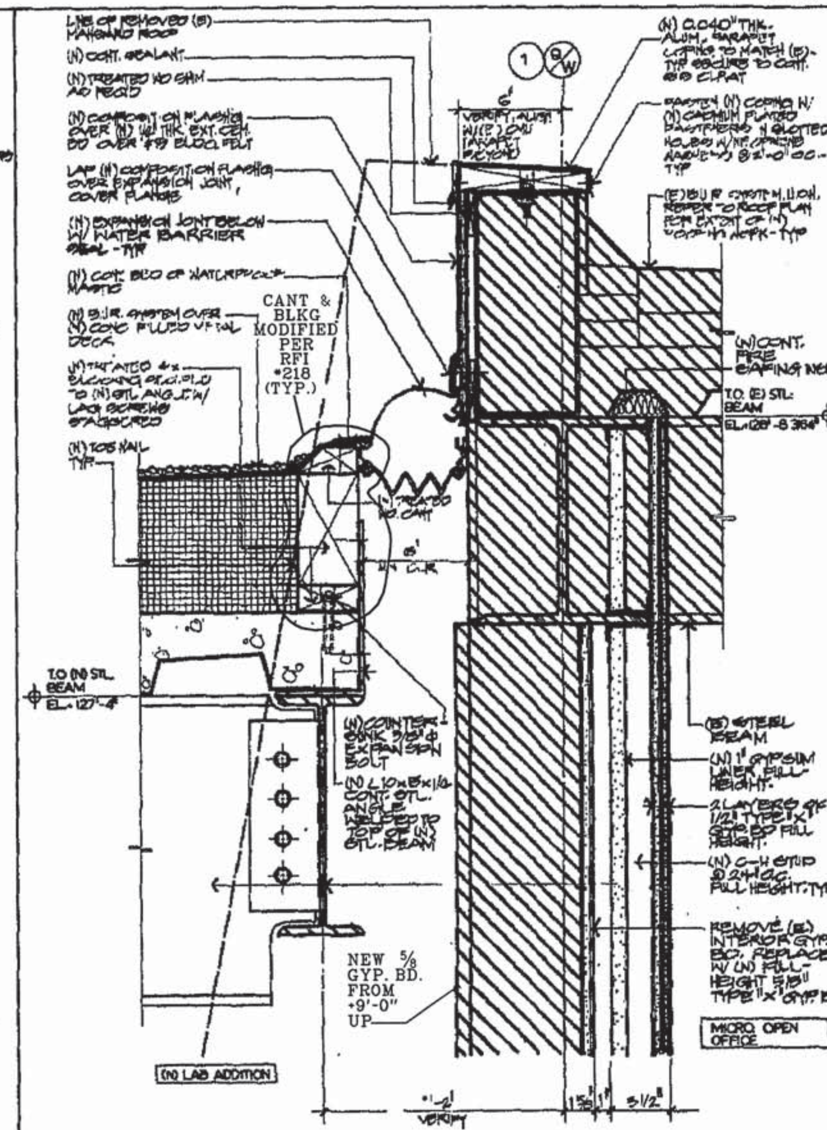
27 MANSARD ROOF AND PARAPET EXPANSION JOINT DETAILS 3"=1'-0"



7 MANSARD ROOF AND PARAPET EXPANSION JOINT (REF. SHT A2.6) NO SCALE



30 ROOF EXPANSION JOINT DETAIL - SECTION AT (N) LAB ADDITION (REF. SHT. 15/A4.11) 3"=1'-0"



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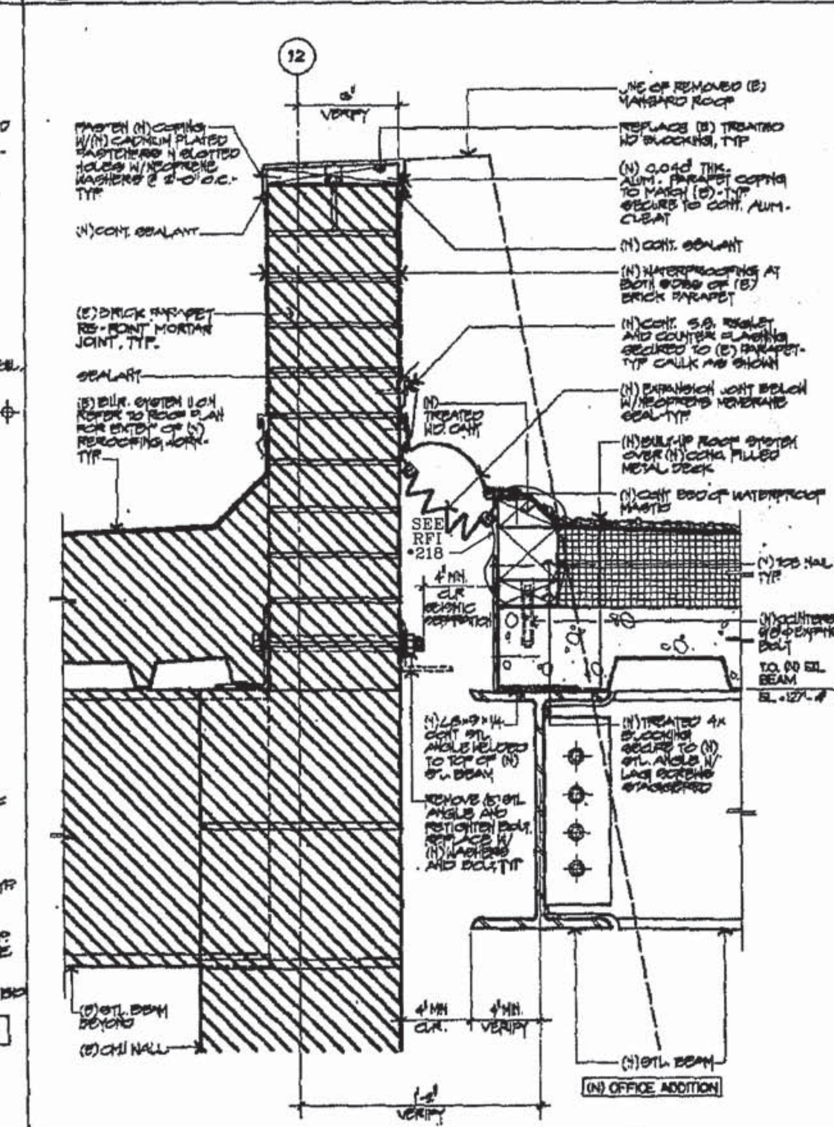

10 ROOF EXPANSION JOINT DETAIL - SECTION AT (N) OFFICE ADDITION (REF SHT. 20/A4.12) 3"=1'-0"

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Issuances and Revisions

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2	1-15-92	ISSUED FOR CONSTRUCTION
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	7-6-95	28 AUG 1994 AS BUILT PYL

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Sheet Title

PARAPET AND MANSARD ROOF EXPANSION JOINT DETAILS (REF. SHT. A4.1 & A4.2)

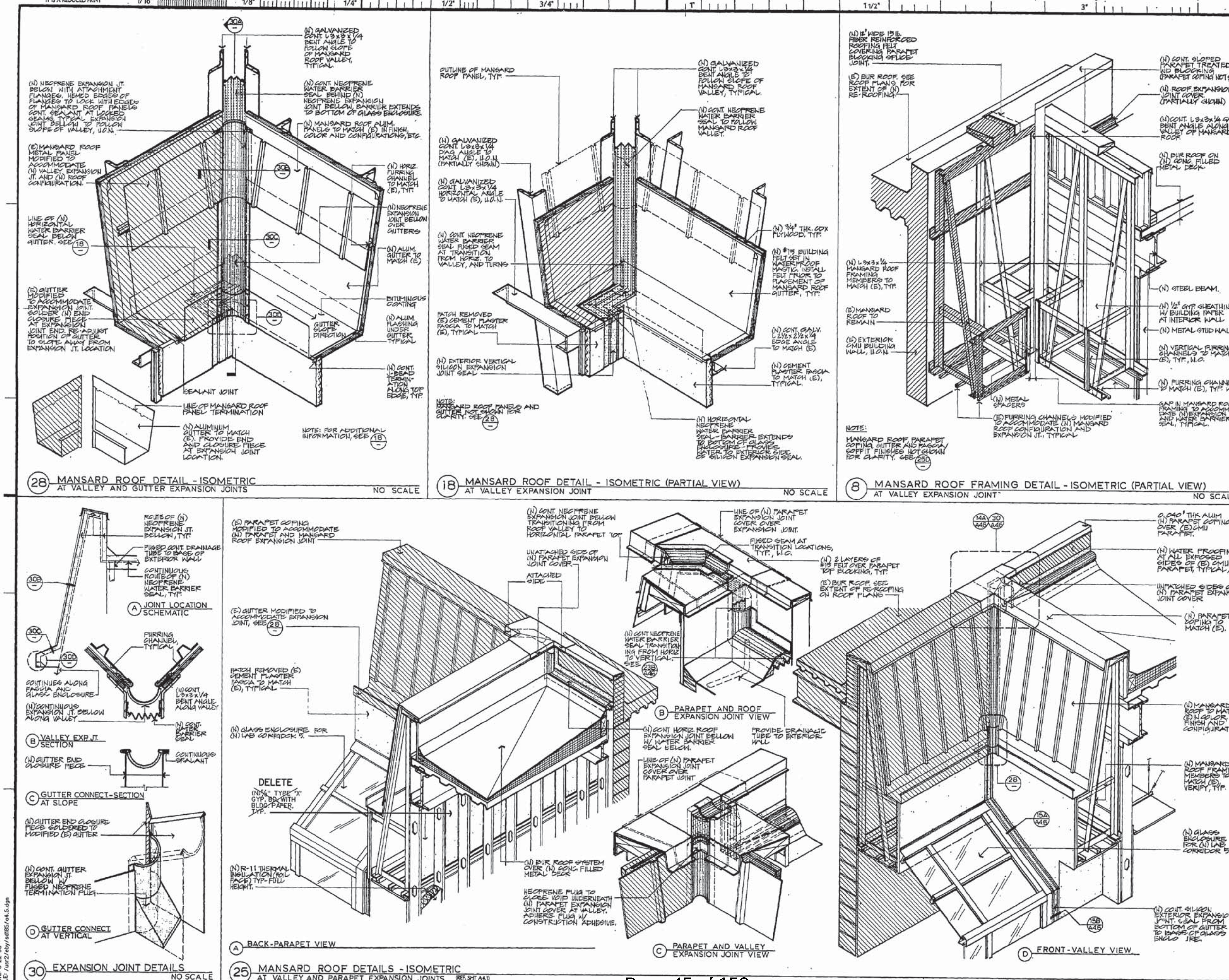
SCALE: AS NOTED

Project No. 9002

A 4.4 | Revision 0

Sheet No. 37/178

OK 9/97 MW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28 MANSARD ROOF DETAIL - ISOMETRIC
AT VALLEY AND GUTTER EXPANSION JOINTS
NO SCALE
18 MANSARD ROOF DETAIL - ISOMETRIC (PARTIAL VIEW)
AT VALLEY EXPANSION JOINT
NO SCALE
8 MANSARD ROOF FRAMING DETAIL - ISOMETRIC (PARTIAL VIEW)
AT VALLEY EXPANSION JOINT
NO SCALE
A JOINT LOCATION SCHEMATIC
B VALLEY EXP JT. SECTION
C GUTTER CONNECT - SECTION AT SLOPE
D GUTTER CONNECT AT VERTICAL
30 EXPANSION JOINT DETAILS
NO SCALE
DELETE
A BACK-PARAPET VIEW
B PARAPET AND ROOF EXPANSION JOINT VIEW
C PARAPET AND VALLEY EXPANSION JOINT VIEW
D FRONT-VALLEY VIEW
25 MANSARD ROOF DETAILS - ISOMETRIC
AT VALLEY AND PARAPET EXPANSION JOINTS
NO SCALE

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MANSARD ROOF EXPANSION JOINT DETAILS
(REF. SHT. A4.1)

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A4.5 | 0

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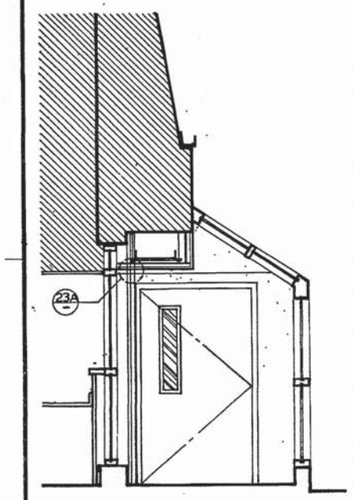
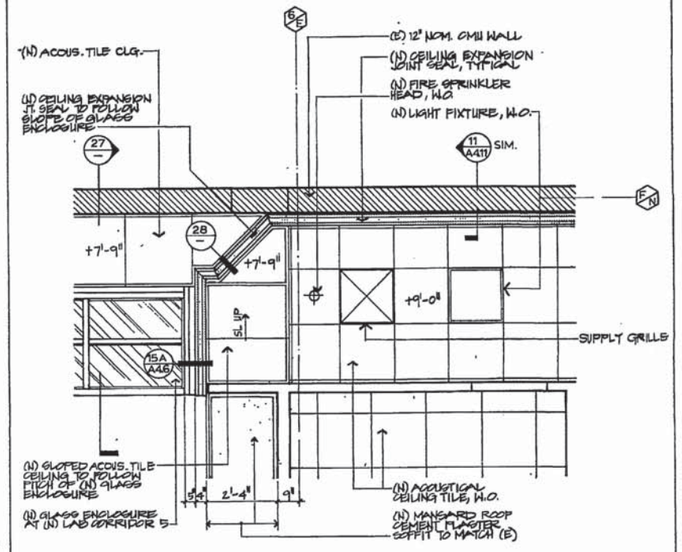
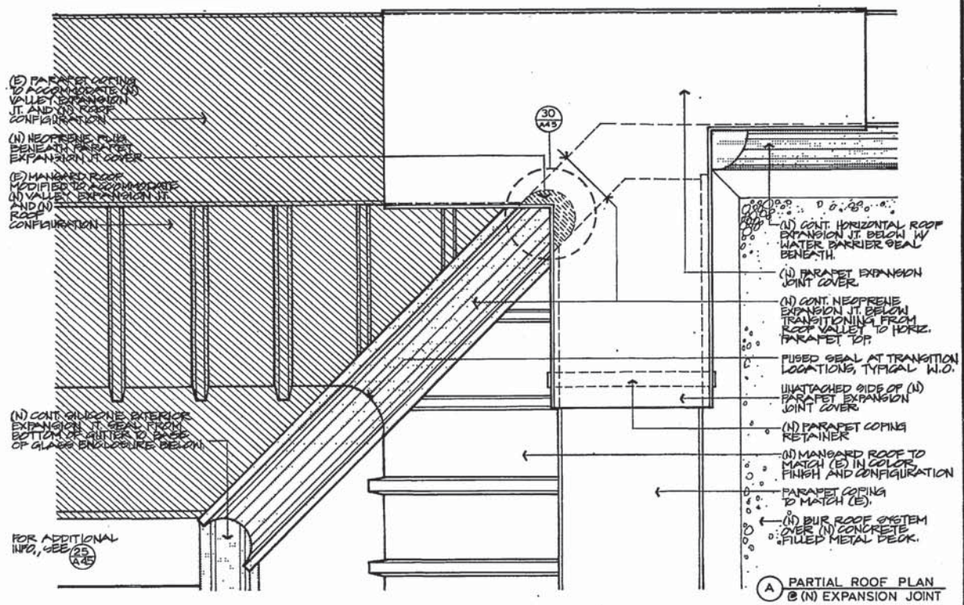


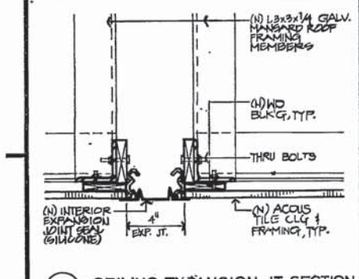
27 PARTIAL SECTION
AT (N) LAB CORRIDOR 5 1/2"=1'-0"



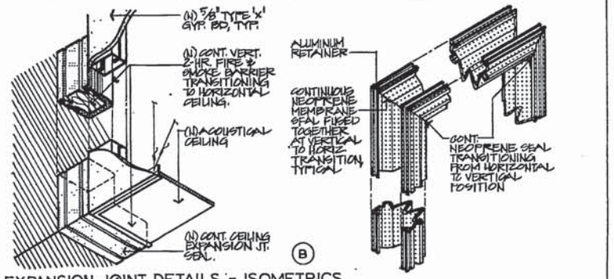
22 PARTIAL ENLARGED REFLECTED CEILING PLAN
AT (N) LAB CORRIDOR 5 AND (N) MANSARD ROOF VALLEY JOINT 1/2"=1'-0"



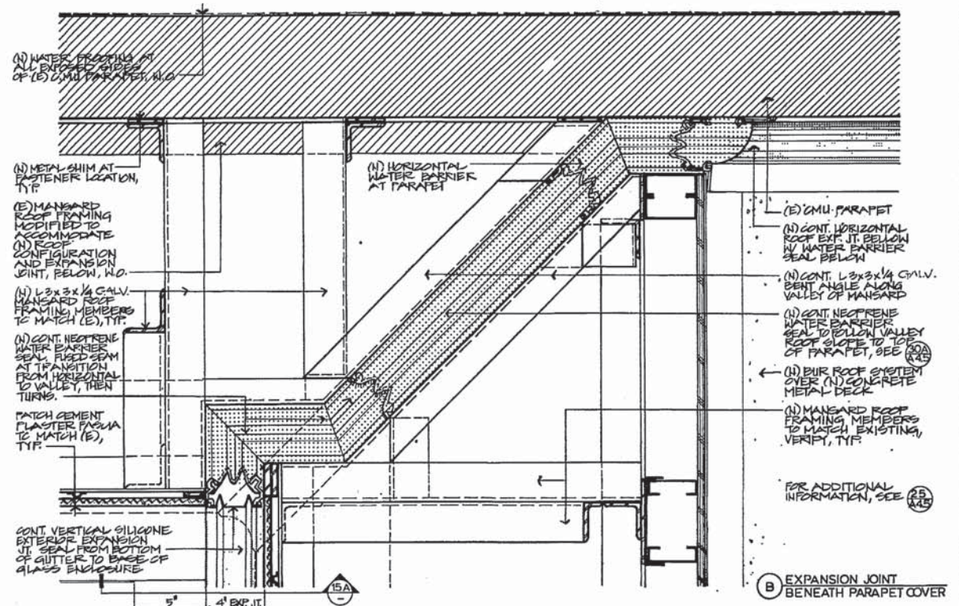
A PARTIAL ROOF PLAN @ (N) EXPANSION JOINT



28 CEILING EXPANSION JT-SECTION
AT (N) LAB CORRIDOR 5 3"=1'-0"

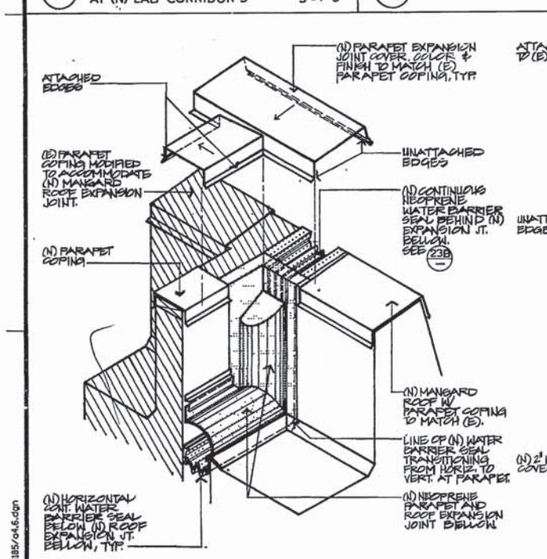


23 EXPANSION JOINT DETAILS - ISOMETRICS
NO SCALE

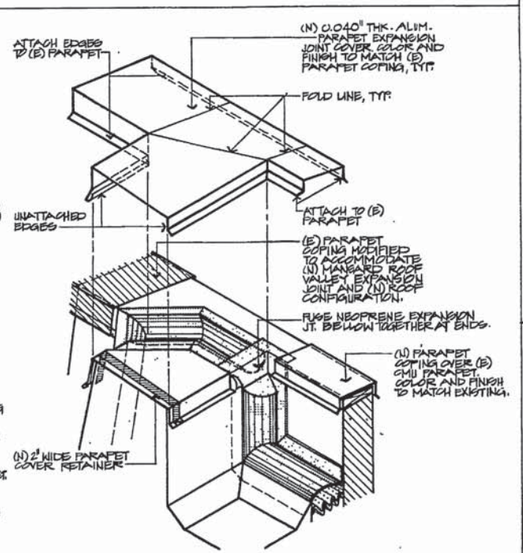


B EXPANSION JOINT BENEATH PARAPET COVER

14 PARAPET AND MANSARD ROOF DETAILS - PLAN
AT EXPANSION JOINTS (REF SHT. A4.5)

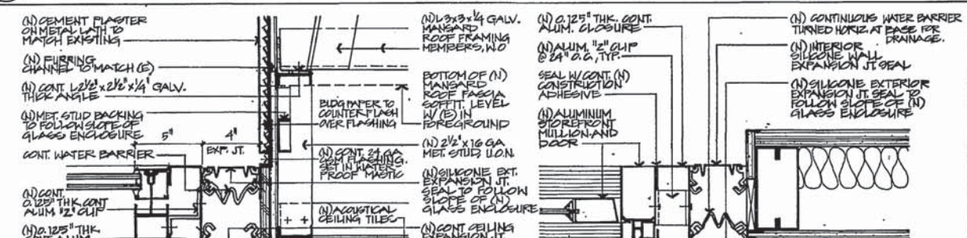


A AT OFFICE ADDITION



B AT MANSARD ROOF VALLEY AND PARAPET EXPANSION JOINT

30 PARAPET AND ROOF EXPANSION JOINT DETAILS - ISOMETRICS
(REF. SHT. 25/A4.5)
NO SCALE



A SECTION AT SLOPED GLASS ENCLOSURE

B SECTION AT BASE - PLAN VIEW

29 EXPANSION JOINT DETAILS
AT (N) GLASS ENCLOSURE/ LAB CORRIDOR 5 (REF. SHT A4.5)

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MANSARD ROOF & MISCELLANEOUS DETAILS (REF. SHT. A4.1)

SCALE: AS NOTED

Project No. 9002

A 4.6 Sheet No. 39/178 | 0 Revision

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GENERAL NOTES

1. SCOPE OF WORK: MAKE REVISIONS TO EXISTING HVAC SYSTEMS SERVING EXISTING BUILDING AS INDICATED. PROVIDE NEW HVAC SYSTEMS FOR THE NEW BUILDING ADDITIONS.
2. WORK TO INCLUDE THE FOLLOWING:
   - A. DEMOLITION.
   - B. REPLACE EXISTING AHU UNITS AND EXHAUST FANS (U.O.N.) SERVING EXISTING BUILDING.
   - C. REVISE AND ADD DUCTWORK AND PIPING, AS SHOWN, REPLACE AIR OUTLETS IN EXISTING BUILDING. REBALANCE SYSTEMS.
   - D. REPLACE TEMPERATURE CONTROLS.
   - E. EXTENSION OF HEATING HOT WATER PIPING FROM EXISTING MAINS TO NEW HEATING COILS.
   - F. INSTALL NEW VOLUME DAMPERS IN (E) DUCTWORK FOR BALANCING AS INDICATED OR REQUIRED.
   - G. NEW AHU SYSTEMS, CHILLER, BOILERS, DUCTWORK, PIPING, AIR OUTLETS, ETC.
   - H. NEW COMPUTERIZED TEMPERATURE CONTROL SYSTEMS TO SERVE EXISTING BUILDING AS WELL AS NEW.
2. INSTALL PIPING AND DUCTWORK PER THE SMACNA GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING SYSTEMS.
3. LOCATE FIRE DAMPERS, VOLUME DAMPERS, COIL MODULES, ETC. SO AS TO ALLOW FOR CONVENIENT ACCESS TO COMPONENTS THAT NEED PERIODIC SERVICING. KEEP AREAS IMMEDIATELY ABOVE ACCESS PANELS FREE OF ANY OBSTRUCTION.
4. FOR EXACT LOCATION OF AIR OUTLETS, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS.
5. PROVIDE THERMOSTAT FOR EACH COIL MODULE/ZONE.
6. ALL INLET FLEXIBLE CONNECTIONS TO CEILING DIFFUSERS AND UNITS SHALL BE AIR TIGHT WITHOUT ANY KINKS OR BENDS.
7. ALL DUCT ELBOWS BEFORE TERMINAL BOXES SHALL BE FULL RADIUS HARD CONNECTION ELBOWS.
8. PROVIDE ACOUSTICALLY LINED DUCTWORK AT ALL DUCTWORK AS INDICATED. SEAL DISCHARGE PLENUMS AIRTIGHT WITH AEROSOL OR OTHER SUITABLE COMPOUND PER SMACNA SECTION IV, PAGE 6.2, CASINGS AND PLENUM CONSTRUCTION STANDARDS.
9. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONTROL VALVES AND OTHER CONTROL DEVICE INSTALLATION.
10. PROVIDE VOLUME DAMPER AT EACH BRANCH TAKE-OFF AND ALL RETURN, SUPPLY AND EXHAUST BRANCHES
11. PROVIDE ACCESS PANEL FOR ALL MECHANICAL SERVICEABLE EQUIPMENT.
12. CONTRACTOR SHALL VISIT SITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING HIS BID.
13. COORDINATE LOCATION OF EQUIPMENT ON ROOF WITH ARCHITECTURAL AND STRUCTURAL DOCUMENTS.
14. PROVIDE FLEXIBLE CONNECTIONS TO DUCTWORK CONNECTED TO FANS.
15. ALLOW MINIMUM 6" OF CLEAR CEILING SPACE BETWEEN PIPING/DUCTWORK AND RECESSED CEILING LIGHTS.
16. PROVIDE DUCT ACCESS PANELS IN NEW AND EXISTING DUCTS TO SERVICE FIRE AND FIRE/SMOKE DAMPERS.
17. PROVIDE FIRE DAMPERS AT ALL DUCT PENETRATIONS OF RATED CEILINGS AND PARTITIONS (U.O.N.).
18. ALL DUCTWORK DIMENSIONS ARE NET INSIDE DIMENSIONS.
19. FOR ROOM NAMES, REFER TO ARCHITECTURAL DRAWINGS.
20. REPLACE OR REPAIR EXISTING HEATING HOT WATER AND DUCTWORK INSULATION WHERE MISSING OR DAMAGED.
21. PROVIDE ACCESS DOOR WHERE POSSIBLE IN ALL NEW DUCTWORK AT 8'-0" INTERVALS.
22. PROVIDE 12 IN.H SQUARE REMOVABLE DOORS EVERY 7 FEET ON ALL DUCTING

ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION USING THE FOLLOWING CRITERIA:

FIXED EQUIPMENT ON GRADE	32% OF OPERATING WEIGHT
FIXED EQUIPMENT ON STRUCTURE	47% OF OPERATING WEIGHT
EMERGENCY POWER EQUIPMENT ON GRADE	45% OF OPERATING WEIGHT
EMERGENCY POWER EQUIPMENT ON STRUCTURE	60% OF OPERATING WEIGHT

FOR FLEXIBLE MOUNTED EQUIPMENT - USE 2x THE ABOVE VALUES. SIMULTANEOUS VERTICAL FORCE - USE 1/3 x HORIZONTAL FORCE

WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER AND THE FIELD REPRESENTATIVE OF THE STATE ARCHITECT.

ABBREVIATION

ABBR.	DESCRIPTION
AC.	AIR CONDITIONING SYSTEM
A.D.	ACCESS DOOR (DUCT OR PLENUM)
AP	ACCESS PANEL
CC	COOLING COIL
CER	CEILING EXHAUST REGISTER
CFM	CUBIC FEET PER MINUTE
CSD	CEILING SUPPLY DIFFUSER
DN	DOWN OR DROP
EF	EXHAUST FAN
EAD	EXHAUST AIR DAMPER
F	FILTER
GPM	GALLONS PER MINUTE
HC	HEATING COIL
HP	HORSE POWER
IB	CONCRETE INERTIA BASE
LT	LIGHT TROFFER
MD	MOTORIZED DAMPER (CONTROL DAMPER)
OAD	OUTSIDE AIR DAMPER
P	PUMP
POD	PRODUCT OF COMBUSTION DETECTOR
RF	RETURN AIR FAN (RELIEF FAN)
RAD	RETURN AIR DAMPER
RHC	REHEAT COIL
SF	SUPPLY FAN
ST	SOUND TRAP
TCP	TEMPRATURE CONTROL PANEL
TD	TRANSFER DUCT
FH	FUME HOOD
TG	TRANSFER GRILLE
FEF	FUME EXHAUST FAN
VD	BUTTERFLY VOLUME DAMPER WITH LOCKING QUADRANT OPERATOR
WER	WALL EXHAUST REGISTER
WRR	WALL RETURN REGISTER
WSR	WALL SUPPLY REGISTER
WSR	WALL SUPPLY REGISTER
WER	WALL EXHAUST REGISTER
CPF	CAPPED FOR FUTURE
(E)	EXISTING
(TYP.)	TYPICAL
HP	HEAT PUMP
RAO	RETURN AIR OPENING
N.I.C.	NOT IN CONTRACT
U.O.N.	UNLESS OTHERWISE NOTED
C.H.	CANOPY HOOD
IW	INDIRECT WASTE PIPING
FL	FIRE PROTECTION PIPING
(N)	NEW

DUCT SYMBOLS

SINGLE LINE	DOUBLE LINE	
T		BRANCH CONICAL TAKE-OFF ROUND TO ROUND
V.D.		VOLUME DAMPER W/LOCKING QUADRANT OPERATOR
B.D.		BACK DRAFT DAMPER
F.D.		FIRE DAMPER W/ACCESS PANEL
B.O.		BAROMETRIC DAMPER
M.D.		MOTORIZED DAMPER (CONTROL DAMPER)
S.D.		SMOKE DETECTOR WITH ACCESS PANELS
S.D.&F.D.		SMOKE & FIRE DAMPER WITH ACCESS PANELS
		THREE WAY TAKE OFF WITH TURNING VANES
R.O.D.		DUCT RISE OR DROP IN DIRECTION OF AIR FLOW WITH FULL DEPTH RADIUS TURN
		TRANSITION SQUARE DUCT TO ROUND DUCT
		FLEXIBLE DUCT
		CEILING SUPPLY REGISTER
		CEILING EXHAUST OR RETURN REGISTER
		BRANCH TAKE-OFF
		BRANCH TAKE-OFF RECTANGULAR TO ROUND
		DUCT TURN WITH AIR FOIL TURNING VANES
		DUCT TURN FULL RADIUS
		HIGH WALL - LOW WALL SUPPLY REGISTER GRILLE OR RETURN/EXHAUST
		FLEXIBLE DUCT
		TWO WAY TAKE-OFF WITH TURNING VANES
		ACOUSTICAL LINING, 1" MINIMUM UNLESS OTHERWISE NOTED.

LEGEND

SYMBOL	ABBR.	DESCRIPTION
		DETAIL NUMBER / DRAWING NUMBER) DETAIL REFERENCE
AHU		EQUIPMENT IDENTIFICATION
10x10 / 400		NEW SIZE / CFM (TYPE)
T		NEW THERMOSTAT
T/D		EXISTING THERMOSTAT
T		EXISTING THERMOSTAT TO BE REMOVED OR RELOCATED
40x20		RECTANGULAR DUCT (FIRST FIGURE - WIDTH, SECOND FIGURE - DEPTH) NEW
		EXISTING DUCTWORK
		EXISTING DUCTWORK TO BE REMOVED
		(E) CER & CRR TO BE REMOVED
		(E) CSD TO BE REMOVED
		(E) COOLING COIL
		(E) COOLING COIL TO BE REMOVED OR RELOCATED
		(N) HEATING COIL
		(N) COOLING COIL
		SECTION THRU ROUND DUCT
		SECTION THRU SUPPLY / OUTSIDE AIR DUCT.
	RA	SECTION THRU RETURN AIR DUCT
	EA	SECTION THRU EXHAUST AIR DUCT
R.O.D. PLAN		
ELEVATION	R/D	DUCT RISE / DROP IN DIRECTION OF FLOW WITH FULL DEPTH RADIUS TURNS.
45°	E.D	EXTERIOR DAMPER WITH STRAP OPERATOR
		TURNING VANES, DOUBLE WIDTH AIR FOIL (HIGH EFFICIENCY TYPE)
	FC	FLEXIBLE DUCT
	A.L.	ACOUSTICAL LINING (SIZE SHOWN INDICATES CLEAR INSIDE SIZE)
	VIB.	VIBRATION ISOLATOR
HWER		HOT WATER REVERSE RETURN
HWS	HWS	HOT WATER SUPPLY
HWR	HWR	HOT WATER RETURN
CHS	CHS	CHILLED WATER SUPPLY
CHR	CHR	CHILLED WATER RETURN
D	D	DRAIN
V	V	VENT
		FLOW DIRECTION IN PIPING
CPF		CAPPED FOR FUTURE
		FIRE RATED SLEEVE ASSEMBLY (G / M1.1)
GV		GATE VALVE
GLV		GLOBE VALVE
		BALLCENTRIC VALVE
GK		GAUGE COCK
CK		CHECK VALVE
BV		BUTTERFLY VALVE
		BALANCING VALVE / CIRCUITSETTER
		CONTROL VALVE (3-WAY)
		CONTROL VALVE (2-WAY)
PRV		PRESSURE RELIEF VALVE
SV		SAFETY VALVE
RV		RELIEF VALVE
SRV		SAFETY RELIEF VALVE
PTRV		PRESSURE AND TEMPERATURE RELIEF VALVE
		MANUAL AIR VENT / PRESSURE GAUGE W/PET COCK / W/PET COCK
ST		STRAINER W/BLOWDOWN
		THERMOMETER
(Y)		FLOW CONTROL VALVE-FLOW MEASURING DEVICE (ANNUBAR)
		BEAM PENETRATION FOR PIPES OR DUCT.
		POINT OF CONNECTION
N(600) / 0(60)		EXISTING DIFFUSER TO REMAIN REBALANCE TO CFM INDICATED
		DUCT SMOKE DETECTOR

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LEGEND, SYMBOLS, ABBREVIATIONS & GENERAL NOTES

Project No. 9002

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Sheet No. 99/178 | Revision

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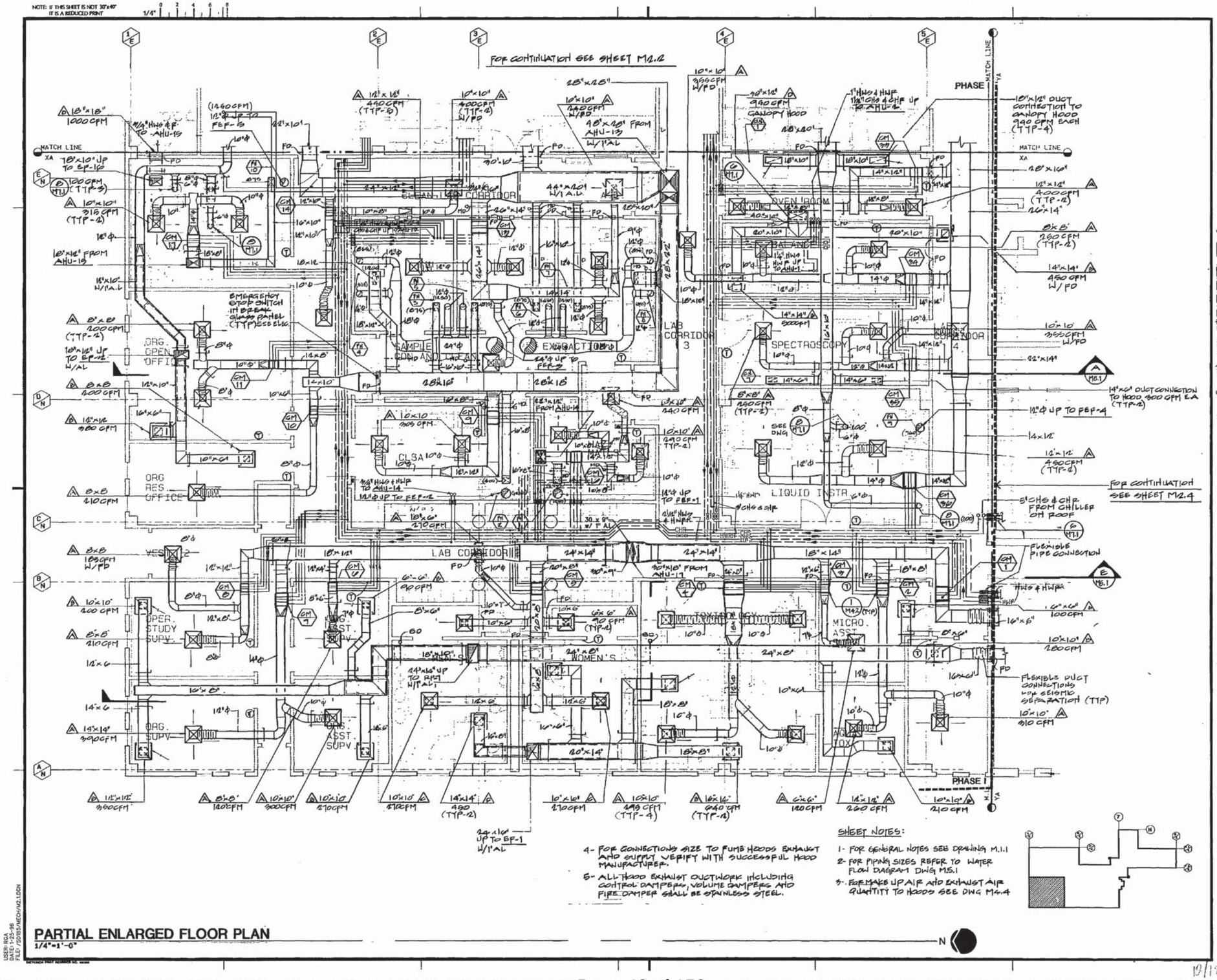

PARTIAL ENLARGED FLOOR PLAN

1/4"=1'-0"

N

USER: RGA
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Sheet Title

FLOOR PLAN/HVAC

1/4"=1'-0"

Project No. 2002

M 2.1 | 0

Sheet No. 100/178 | Revision

10/17/96 GMP

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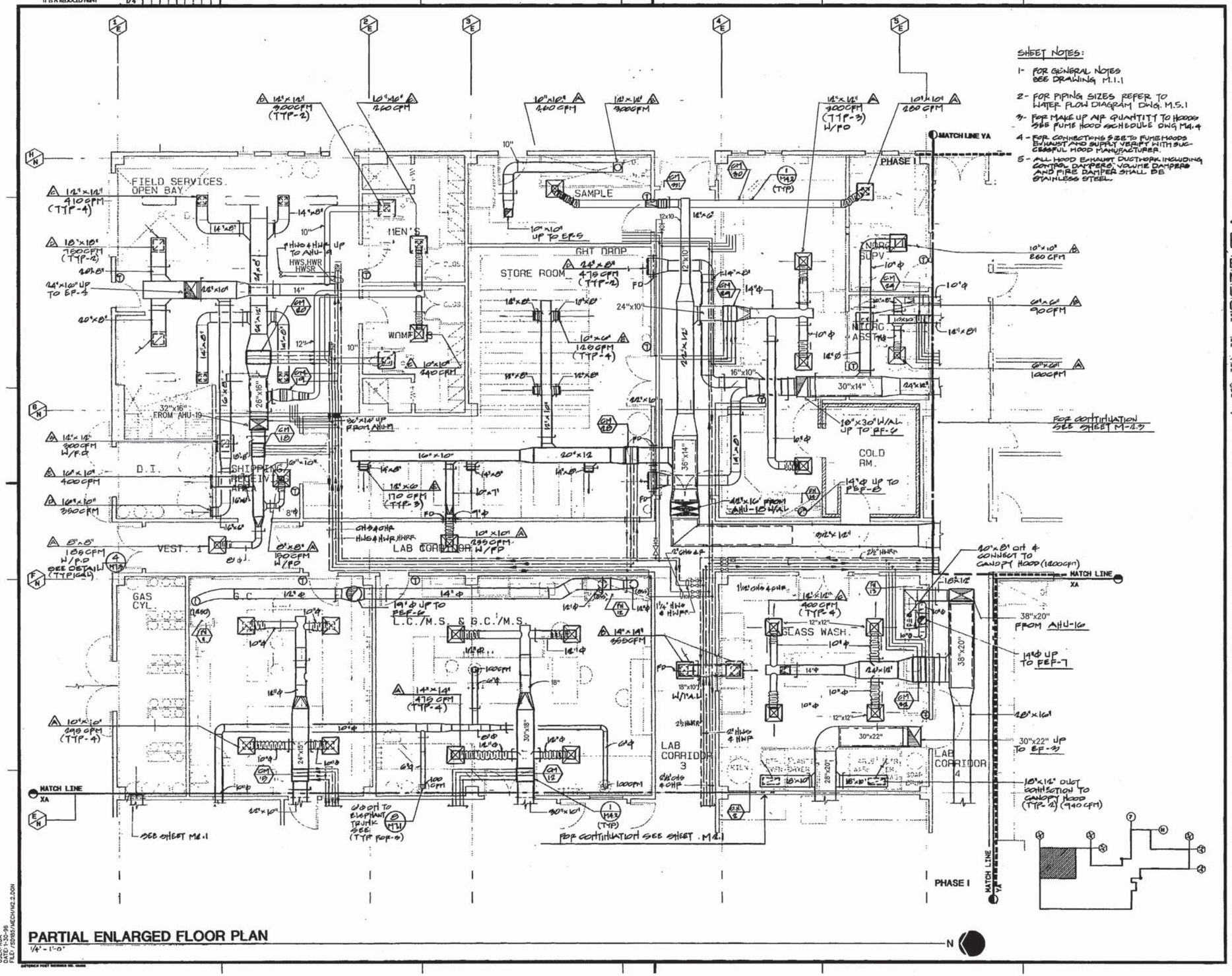

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CALIFORNIA 94109.2589
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Architect Reg. No.

LAB EXPANSION PROJECT SD-185

EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENGR. R.P.E. NO. C 30959

EBMUD PROJECT MGR. R.P.E. NO. C 31906

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

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Issuances and Revisions

No.	Date	Description
A	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 4
	3-3-93	AS BUILT UPDATE
	1-30-96	AS BUILT

Date 7/29/91

Sheet Title

FLOOR PLAN/HVAC

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

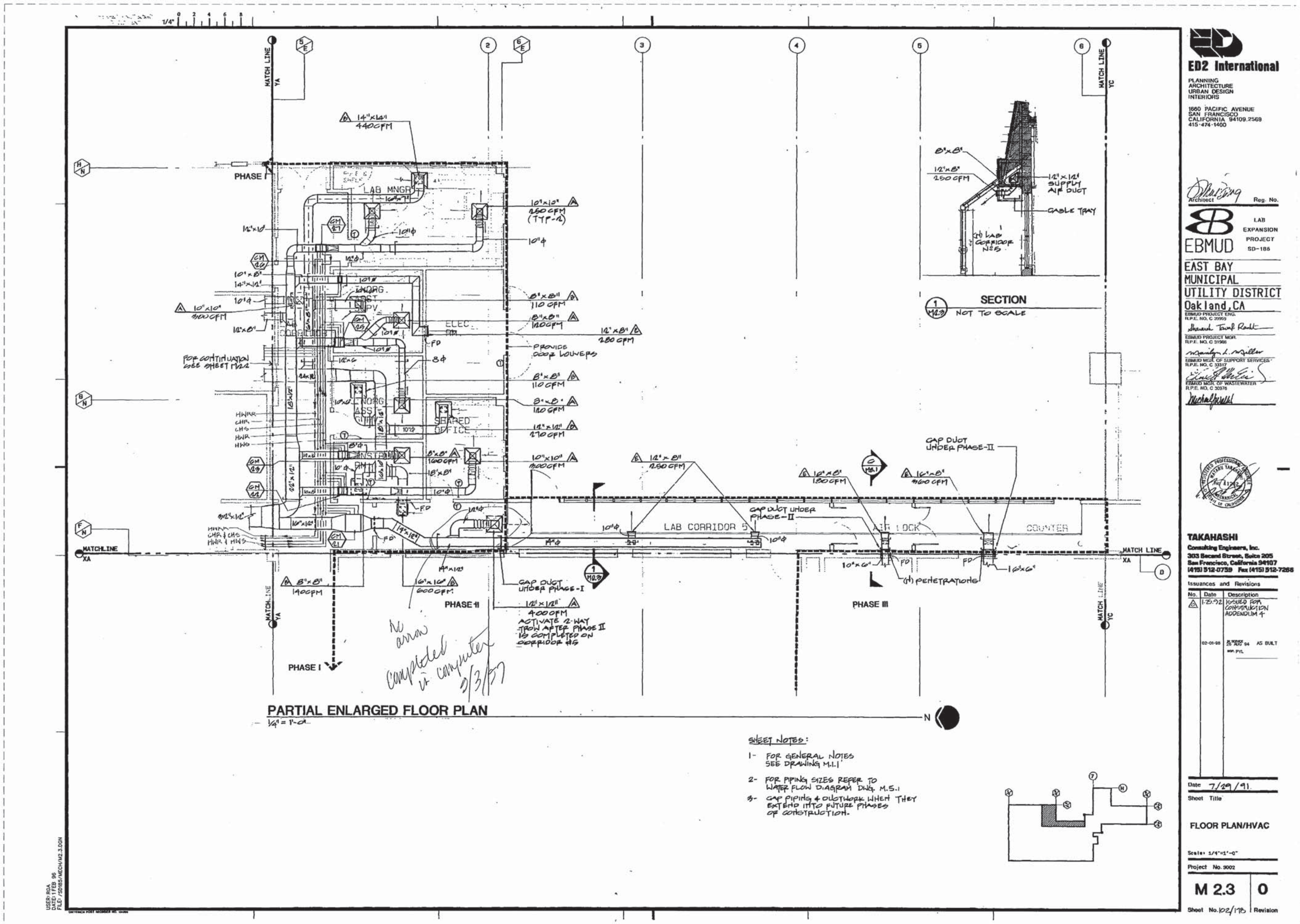
Project No. 9002

M 2.2 | 0

Sheet No. 101/178 | Revision

USER: RGA
DATE: 1-30-96
FILE: EDSBU/MECH/M2-2.DGN

OK 9/3/97


PARTIAL ENLARGED FLOOR PLAN
1/4" = 1'-0"
SECTION
NOT TO SCALE
LAB MNGR
ELEC
SHARED OFFICE
LAB CORRIDOR 5
AIR LOCK
COUNTER
PHASE I
PHASE II
PHASE III
MATCH LINE
CAP DUCT UNDER PHASE-II
CAP DUCT UNDER PHASE-I
PROVIDE DOOR LOUVERS
FOR CONTINUATION SEE SHEET M2.2
12"x12" 400CFM ACTIVATE 2-WAY THROW AFTER PHASE II IS COMPLETED ON CORRIDOR #5
12"x12" SUPPLY AIR DUCT
CABLE TRAY
(4) PENETRATIONS
SHEET NOTES:
1- FOR GENERAL NOTES SEE DRAWING M.1.1
2- FOR PIPING SIZES REFER TO WATER FLOW DIAGRAM DWG. M.5.1
3- CAP PIPING & DUCTWORK WHEN THEY EXTEND INTO FUTURE PHASES OF CONSTRUCTION.
ED2 International
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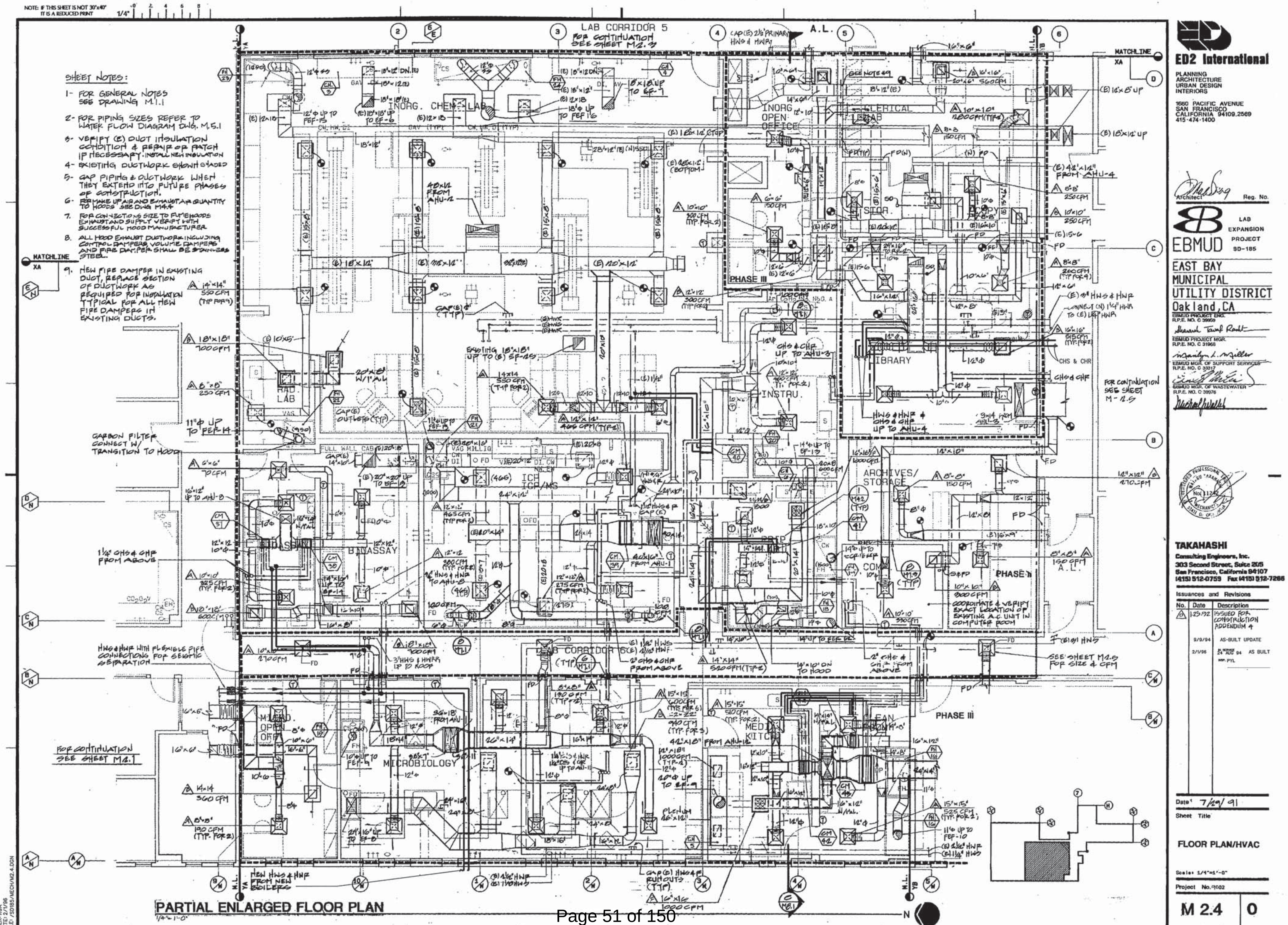
Issuances and Revisions
ISSUED FOR CONSTRUCTION ADDENDUM 4
AS BUILT
Date 7/29/91
Sheet Title
FLOOR PLAN/HVAC
Scale: 1/4"=1'-0"
Project No. 9002
M 2.3
0
no arrow completed in computer 3/3/97


NOTE: IF THIS SHEET IS NOT 30"x40" IT IS A REDUCED PRINT
SHEET NOTES:
1- FOR GENERAL NOTES SEE DRAWING M1.1
2- FOR PIPING SIZES REFER TO WATER FLOW DIAGRAM DWG. M5.1
3- VERIFY (E) DUCT INSULATION CONDITION & REPAIR OR PATCH IF NECESSARY. INSTALL NEW INSULATION
4- EXISTING DUCTWORK SHOWN SHADED
5- CAP PIPING & DUCTWORK WHEN THEY EXTEND INTO FUTURE PHASES OF CONSTRUCTION.
6- FOR MAKE UP AIR AND EXHAUST AIR QUANTITY TO HOODS SEE DWG M4.4
7- FOR CONNECTIONS SIZE TO FUMEHOODS EXHAUST AND SUPPLY VERIFY WITH SUCCESSFUL HOOD MANUFACTURER
8- ALL HOOD EXHAUST DUCTWORK INCLUDING CONTROL DAMPERS, VOLUME DAMPERS AND FIRE DAMPER SHALL BE STAINLESS STEEL.
9- NEW FIRE DAMPER IN EXISTING DUCT, REPLACE SECTION OF DUCTWORK AS REQUIRED FOR INSTALLATION TYPICAL FOR ALL NEW FIRE DAMPERS IN EXISTING DUCTS.
LAB CORRIDOR 5
FOR CONTINUATION SEE SHEET M2.3
INORG. CHEM. LAB
INORG OPEN OFFICE
CLERICAL
LIBRARY
INSTRU.
RAD LAB
BIOASSAY
ICP/MS
ARCHIVES/STORAGE
PHASE III
LAB CORRIDOR 6
MICROBIOLOGY
MEDIA KITCH.
FOR CONTINUATION SEE SHEET M4.1
FOR CONTINUATION SEE SHEET M-2.5
PARTIAL ENLARGED FLOOR PLAN
1/4"=1'-0"
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Issuances and Revisions
Date 7/29/91
Sheet Title
FLOOR PLAN/HVAC
Scale: 1/4"=1'-0"
Project No. 9002
M 2.4
0
Revision

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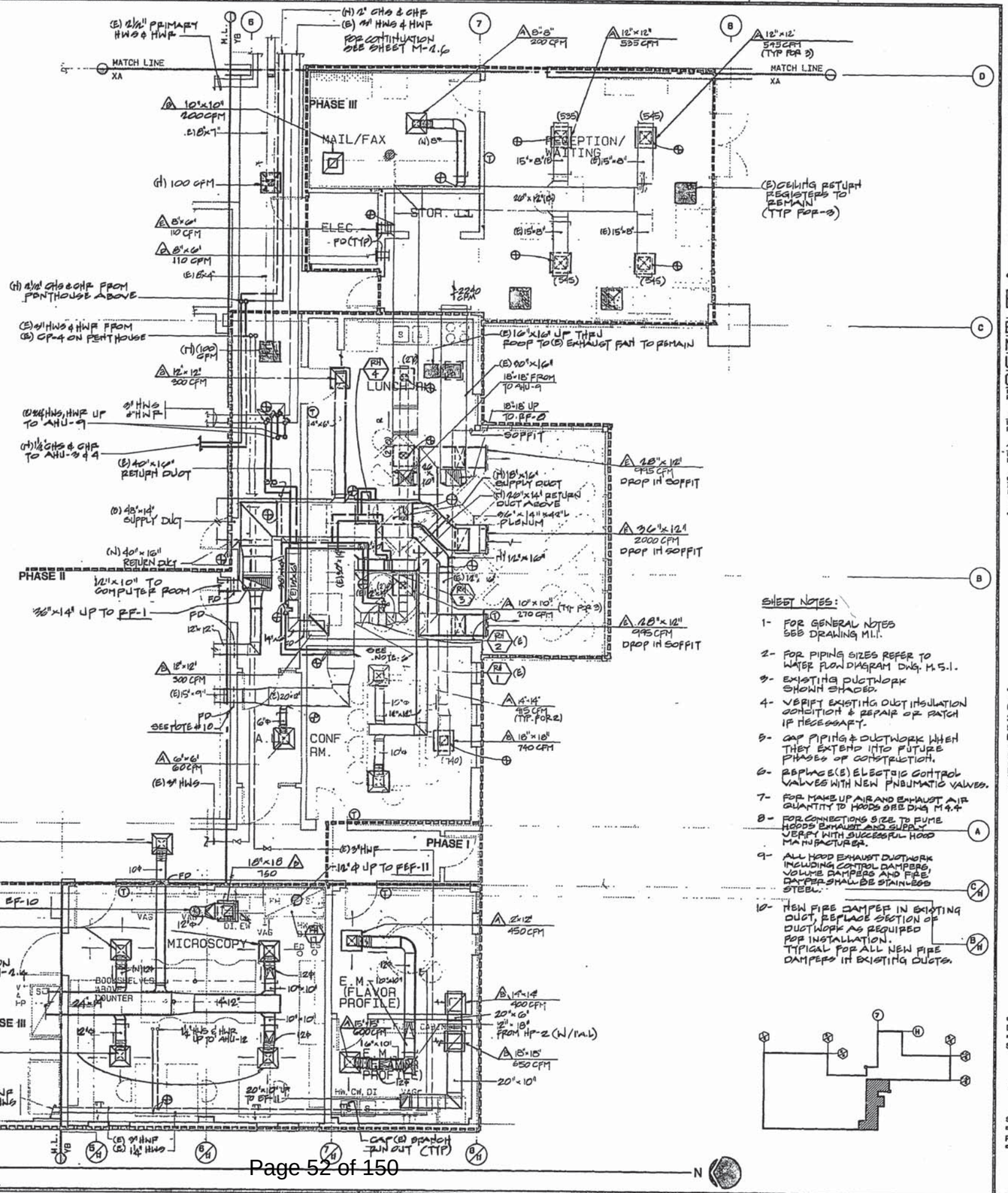
1/4" 0 2 4 6 8



PARTIAL ENLARGED FLOOR PLAN

1/4" = 1'-0"

SHEET NOTES:

1- FOR GENERAL NOTES SEE DRAWING M1.1.

2- FOR PIPING SIZES REFER TO WATER FLOW DIAGRAM DWG. M5.1.

3- EXISTING DUCTWORK SHOWN SHADED.

4- VERIFY EXISTING DUCT INSULATION CONDITION & REPAIR OR PATCH IF NECESSARY.

5- CAP PIPING & DUCTWORK WHEN THEY EXTEND INTO FUTURE PHASES OF CONSTRUCTION.

6- REPLACE (E) ELECTRIC CONTROL VALVES WITH NEW PNEUMATIC VALVES.

7- FOR MAKE UP AIR AND EXHAUST AIR QUANTITY TO HOODS SEE DWG M4.4

8- FOR CONNECTIONS SIZE TO FUME HOODS EXHAUST AND SUPPLY VERIFY WITH SUCCESSFUL HOOD MANUFACTURER.

9- ALL HOOD EXHAUST DUCTWORK INCLUDING CONTROL DAMPERS, VOLUME DAMPERS AND FIRE DAMPER SHALL BE STAINLESS STEEL.

10- NEW FIRE DAMPER IN EXISTING DUCT, REPLACE SECTION OF DUCTWORK AS REQUIRED FOR INSTALLATION. TYPICAL FOR ALL NEW FIRE DAMPERS IN EXISTING DUCTS.

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LAB EXPANSION PROJECT SD-185

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No.	Date	Description
2	1-25-92	ISSUED FOR CONSTRUCTION
	11-19-93	AS BUILT UPDATE
	2-5-96	AS BUILT

Date: 7/29/91

Sheet Title: FLOOR PLAN/HVAC

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

Project No. 8002

M 2.5 | 0

Sheet No. 109/178 | Revision

USER: RGA
DATE: 2-5-96
FILE: /50185/MECH/M2.5.DGN

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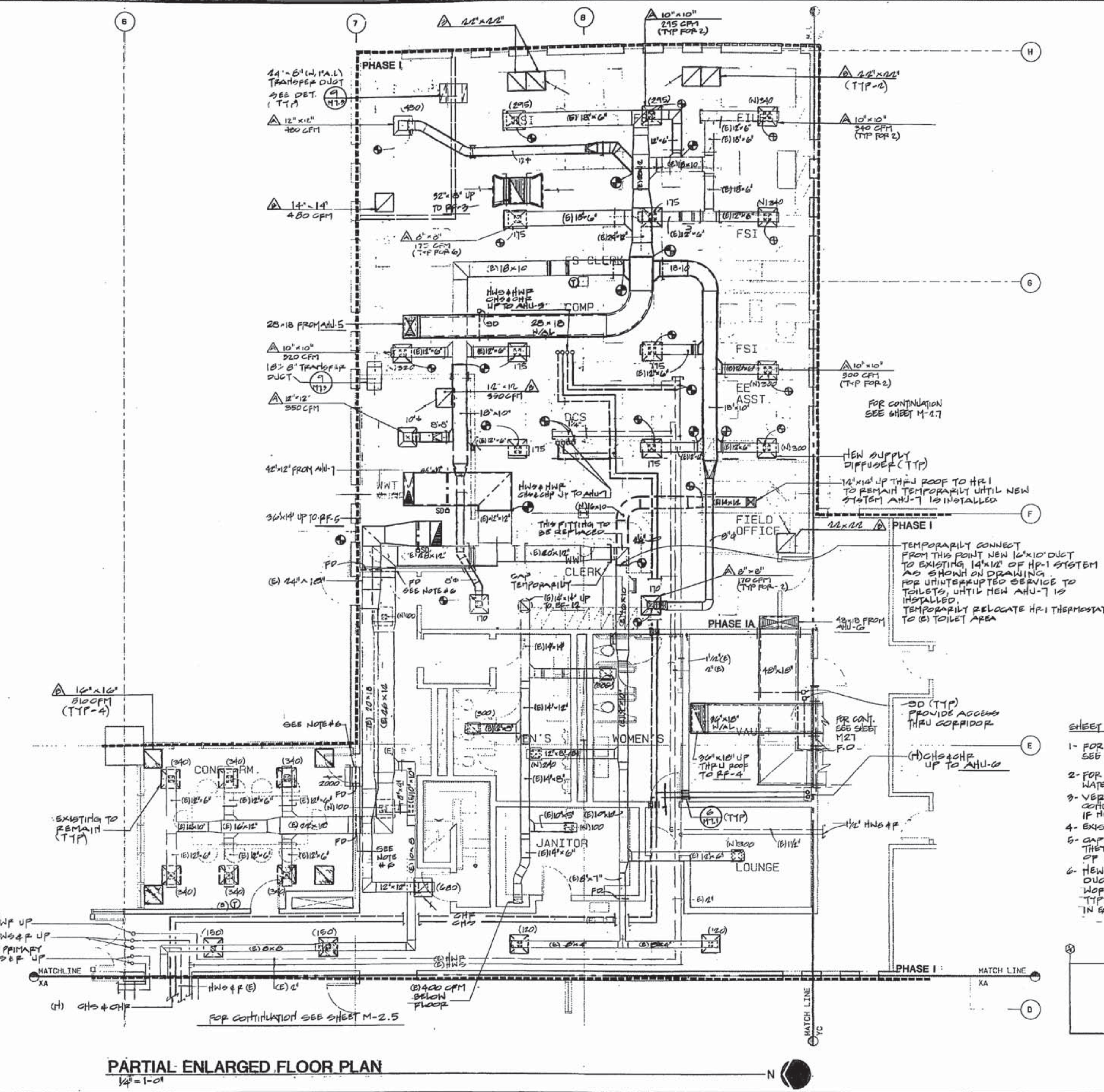
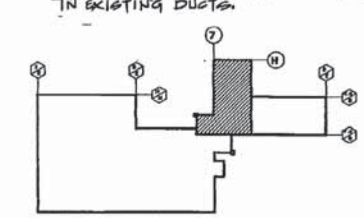


PARTIAL ENLARGED FLOOR PLAN

1/4" = 1'-0"

SHEET NOTES:

1- FOR GENERAL NOTES SEE DRAWING M.1.1
2- FOR PIPING SIZES REFER TO WATER FLOW DIAGRAM DWG. M.5.1
3- VERIFY (E) DUCT INSULATION CONDITIONS & REPAIR OR PATCH IF NECESSARY.
4- EXISTING DUCTWORK SHOWN SHADED
5- CAP PIPING & DUCTWORK WHEN THEY EXTEND INTO FUTURE PHASES OF CONSTRUCTION.
6- NEW FIRE DAMPER IN EXISTING DUCT, REPLACE SECTION OF DUCTWORK AS REQUIRED FOR INSTALLATION TYPICAL FOR ALL NEW FIRE DAMPERS IN EXISTING DUCTS.



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EAST BAY MUNICIPAL UTILITY DISTRICT Oakland, CA

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EBMUD PROJECT MGR. R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

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Issuances and Revisions

No.	Date	Description
A	1-25-92	ISSUED FOR CONSTRUCTION
	6-4-93	RECORD DRAWINGS ALLIED ME
	2-8-96	26 AUG 94 AS BUILT PYL

Date. 7/29/91.

Sheet Title

FLOOR PLAN/HVAC

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

Project No. 9002

M 2.6 | 0

Sheet No. 105/178 Revision

USER: RGA DATE: 2-8-96 FILE: /SD185/MECH/M2.6.DGN

GOOD 12/18

LEGEND

- EXISTING DUCTWORK, AIR OUTLETS, STRAPS, HANGERS & RELATED APPURTENANCES TO BE REMOVED.
- EXISTING DUCTWORK TO REMAIN
- EXISTING PIPING TO BE REMOVED

NOTES

1. INSTALL NEW CEILING TILES IN AREAS WHERE EXISTING DIFFUSERS & REGISTERS ARE REMOVED AND ARE NOT BEING REPLACED BY NEW. NEW CEILING TILES TO MATCH EXISTING.
2. VERIFY EXISTING CONDITIONS, BEFORE DEMOLITION, SUBMIT SHOP DRAWINGS FOR DEMOLITION AND TIE IN WITH NEW WORK.
3. REMOVE HWS & HWR BRANCHES PIPING TO TERMINAL BOX AND CAP MAIN.
4. REMOVE HWS & HWR UP THRU ROOF TO AHU UNIT & CAP AT MAIN. FILL EXISTING OPENING THRU ROOF & SEAL WATERTIGHT.
5. TB = TERMINAL BOX. C = TERMINAL CONSTANT VOLUME BOX, RCF = RECIRCULATING FAN
6. ALL PIPE SIZES SHOWN ARE EXISTING SIZES.
7. DISCONNECT 3/4" HWS & HWR RISERS FROM BRANCH & CAP AT BRANCHES

(1/M2.8) FLOOR PLAN DEMOLITION 1/8" = 1'-0"

DEMOLITION FLOR PLAN 1/8"=1'-0"

SEE ARCHITECTURAL DWGS A4.2 FOR PATCHING OF ALL EXISTING PENETRATIONS THRU ROOF.

MATCH LINE

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LAB EXPANSION PROJECT
EBMUD SD-185

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

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EBMUD PROJECT MGR. R.P.E. NO. C 31966
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 20317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 35978

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	2-13-96	AS BUILT

Date 7/29/91

Sheet Title
DEMOLITION

1/8" 1'-0"

Project No. 9002

M 2.8 | 0

Sheet No. 107/178 | Revision

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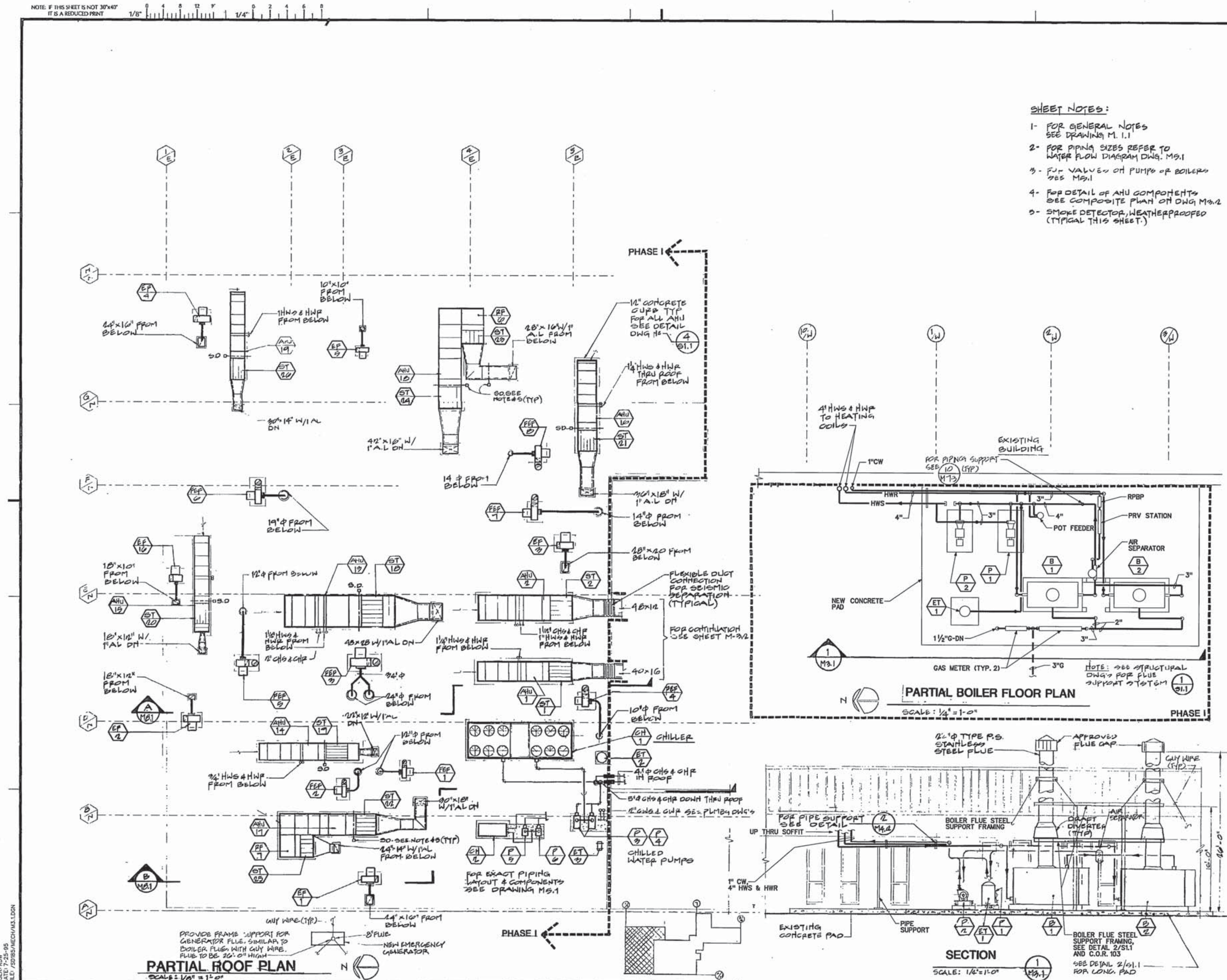
DATE: 2-13-96
FILE: SD185/MECH/M2.8.DGN



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LAB EXPANSION PROJECT ED-185

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Oakland, CA

EBMUD PROJECT ENG.
EBMUD PROJECT MGR.
EBMUD MGR. OF SUPPORT SERVICES
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2	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 4
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	9-9-94	UPDATE
	7-25-95	IN SERVICE 26 AUG 1994 AS BUILT

Date 7/29/91

Sheet Title
ROOF PLAN AND PARTIAL BOILER FLOOR PLAN
SCALE AS NOTED

Project No. 9002

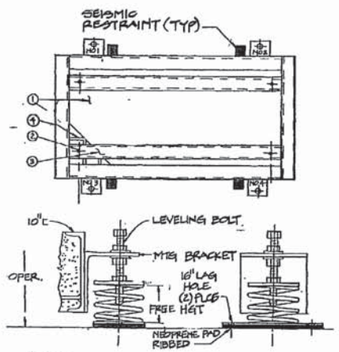
M 3.1 | 0

Sheet No. 108/178 Revision

OK 9/13/97

NOTE: IF THIS SHEET IS NOT 30"x40" IT IS A REDUCED PRINT

1/8" 0 4 8 12 16

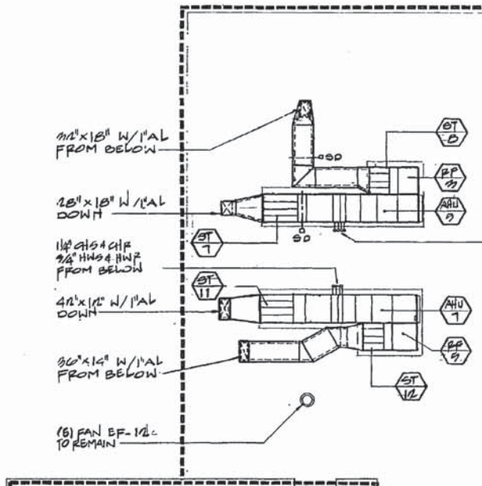


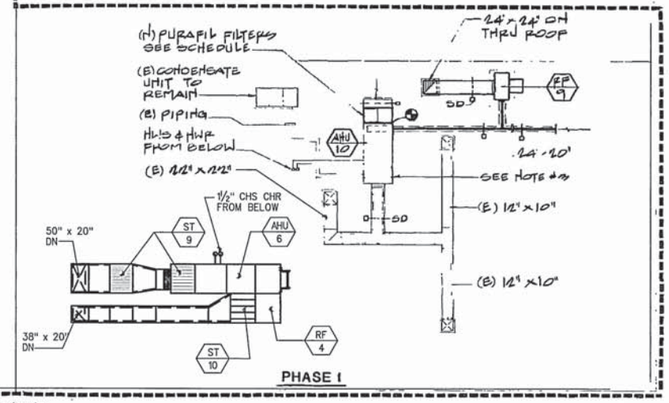
NOTES
1. APPROX. INERTIA BLK. WGT # CONCRETE BY OTHERS.
2. ¾" DIA ANCHOR BOLT TYP ( ) PLACES.
3. 2" CHANNEL MTG. TEMPLATE
4. #4 REBAR ON 12" CTRS BOTH DIRECTIONS
5. ■ S/P LOCATIONS

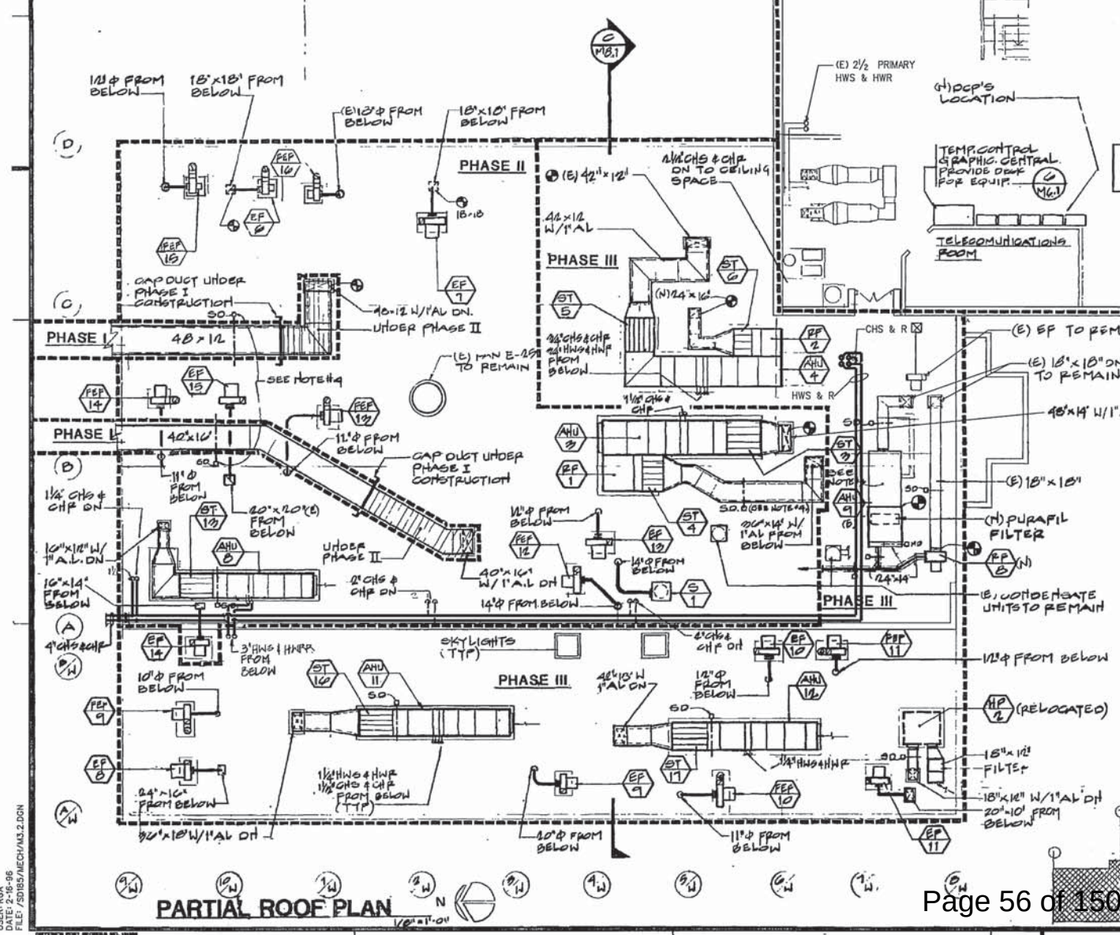
INERTIA BASE DETAIL

NOT TO SCALE

1 M3.4

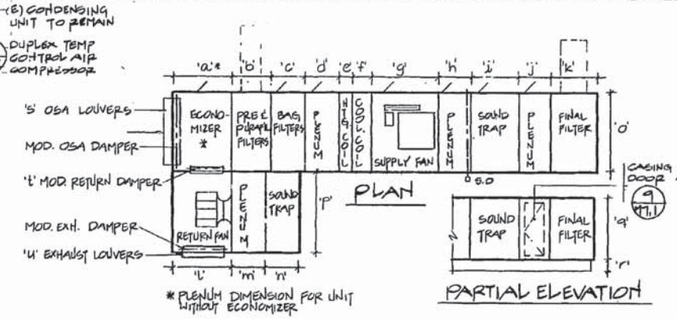






PARTIAL ROOF PLAN

1/8"=1'-0"



COMPOSITE AHU PLAN

NOT TO SCALE

AHU COMPONENT DIMENSIONS

UNIT No.	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u
AHU-1	21	36	30	26	6	-	47	24	36	-	-	-	-	-	54	-	40	10	48-30	-	-
AHU-2	21	36	30	26	6	13	55	24	36	-	-	-	-	-	63	-	40	10	54-36	-	-
AHU-3	40½	36	30	26	-	13	47	24	36	-	-	55½	15	36	54	63	40	10	48-30	42×30	42×30
AHU-4	49½	36	30	26	6	13	49½	21	36	-	-	49½	15	36	54	61	40	10	42×20	32×20	32×20
AHU-5	49½	36	30	26	6	13	47	24	36	-	-	49½	15	36	54	61	40	10	48×30	36×30	36×30
AHU-6	49½	36	30	26	-	13	47	24	36	-	-	49½	15	36	54	61	40	10	48×30	42×30	42×30
AHU-7	49½	36	30	26	6	13	47	21	36	-	-	49½	15	36	48	54	40	10	42×28	30×28	30×28
AHU-8	21	36	30	26	6	-	49½	24	36	-	-	-	-	-	39	-	29	8	30×18	-	-
AHU-11	21	36	30	26	6	13	47	24	36	-	-	-	-	-	54	-	34½	8	40×24	-	-
AHU-12	21	36	30	26	6	-	47	21	36	-	-	-	-	-	54	-	40	10	48×32	-	-
AHU-13	21	36	30	26	6	19	61½	34	36	15	15	-	-	-	88	-	61½	12	84×54	-	-
AHU-14	21	36	30	26	6	-	47	21	36	15	15	-	-	-	39	-	29	8	30×40	-	-
AHU-15	21	36	30	26	6	-	47	21	36	15	15	-	-	-	39	-	29	8	24×15	-	-
AHU-16	21	36	30	26	6	-	55	24	36	-	-	-	-	-	63	-	40	10	54-24	-	-
AHU-1'	49½	36	30	26	-	-	47	24	36	-	-	49½	15	36	54	-	34½	8	40×20	24×22	24×28
AHU-12	49½	36	30	26	-	-	55	24	36	-	-	49½	15	36	54	63	40	10	40×32	30×24	30×24
AHU-M	21	36	30	26	6	-	47	21	36	-	-	-	-	-	48	-	34½	8	42×22	-	-

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EAST BAY MUNICIPAL UTILITY DISTRICT
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EBMUD PROJECT ENG. P.E. NO. C 30959
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	12-27-93	RECORD DRAWING UPDATE/
	2-15-96	2/5/2005 94 AS BUILT MRP. PYL

Date 7/29/91

Sheet Title

ROOF PLAN

1/8"=1'-0"

Project No. 9002

M 3.2 | 0

Sheet No. 109/178 | Revision

USER: RCA
DATE: 2-16-96
FILE: /SD185/MECH/M3.2.DGN

(E) AHU-5
(E) HP-1 TO REMAIN TEMPORARILY FOR SUPPLY OF EXISTING TOILET AREA UNTIL NEW AHU-7 IS INSTALLED SEE DWG M2.0
(E) AHU-7
CAP (E) RETURN
(E) 12x14 DN
(E) 14"x14" DN REMOVE & PATCH PENETRATION
(E) CONDENSATE UNIT TO REMAIN
(E) AHU-10 TO REMAIN
(E) EF
(E) EF-12 TO REMAIN
(E) EF-13
(E) EF-14
(E) AHU-6
(E) AIR CONDITIONER UNIT TO REMAIN
(E) TEMPERATURE CONTROL PANELS
(E) CP-3
(E) P-4
(E) 2" HWR
(E) 3" HWS & HNP
(E) 6 1/2" PRIMARY HWS & HWR TO REMAIN
(E) CP-1 & 2
TO (E) UNIT HEATERS
(E) SF-1 & SF-2 BELOW
TO (E) HTG COILS SF-1, SF-2, SF-3 & SF-4
(E) SF-3 & SF-4 BELOW
(E) VAC PUMPS
(E) MWH
(E) EF-5
(E) EF-1
(E) EF-4
(E) EF-2
(E) EF-3
REMOVE (E) UNIT & PATCH ROOF PENETRATION
(E) EF-7
(E) EF-6
(E) AHU-4
(E) EF-8
(E) AHU-2
(E) HP-2 TO BE RELOCATED SEE DWG. M2.2
(E) FAN EF-13 TO REMAIN
REMOVE (E) UNIT & PATCH ROOF PENETRATION
REMOVE (E) HWS & HNP & PATCH PENETRATIONS (TYP)
(E) EF-11 TO REMAIN
(E) EF-9
(E) AHU-3
(E) AHU-9 TO REMAIN
(E) AHU-8
(E) EF-105
(E) EF-106
(E) EF-111
(E) EF-10
(E) AHU-1
REMOVE (E) HWS & HNP & PATCH PENETRATION (TYP)
(E) CONDENSING UNIT
(E) CONDENSING UNIT TO REMAIN
(E) CONDENSING UNIT TO REMAIN
(E) EF-107
(E) EF
(E) EF
(E) EF-110
SKY-LIGHTS TO REMAIN
(E) EF-102
(E) EF-109
(E) EF-101
(E) EF-108
(E) EF-104
(E) EF-108
PATCH (E) PENETRATION THRU ROOF (TYP)
(E) AHU TO BE REMOVED (TYP)
PATCH & SEAL (E) PENETRATIONS THRU ROOF (TYP)

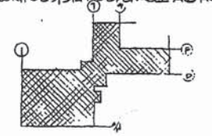
ROOF PLAN DEMOLITION

Scale: 1/8" = 1'-0"

N

SHEET NOTES

1- FOR GENERAL NOTES SEE DRAWING M-1.1
2- SEE ARCHITECTURAL DWG A4.2 FOR PATCHING OF ALL EXISTING PENETRATIONS THRU ROOF
3- DO NOT DISMANTLE (E) TEMPERATURE PANELS UNTIL AFTER NEW TEMPERATURE CONTROL SYSTEM IS OPERABLE AND ACCEPTED BY ENGINEER



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Architect Reg. No.

EBMUD
LAB EXPANSION PROJECT SD-185

EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG. R.P.E. NO. C 20659
EBMUD PROJECT MGR R.P.E. NO C 31966
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 23317
EBMUD MGR. OF WASTEWATER R.P.E NO. C 30976

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Issuances and Revisions

No.	Date	Description
1	1-23-96	ISSUED FOR CONSTRUCTION ADDENDUM 2&4
	2-16-96	AS BUILT

Date 7/29/97

Sheet Title
ROOF PLAN DEMOLITION

1/8"= 1'-0"

Project No. 9002

M 3.3 | 0
Sheet No. 10/18 | Revision

USER: RGA
DATE: 2-16-96
FILE: /SD185/MECH/M3.3.DGN

GK 9/19/96 RMK

AIR HANDLING UNIT SCHEDULE

TAG	SERVICE	MANUFACTURER MODEL #	LOCATION	CFM	FAN SP IN WG	FAN MIN WHEEL DIA.	FAN RPM	MOTOR HP	MOTOR VOLT/PHASE	COOLING COIL SIZE	ROW	FACE AREA SF	FACE VEL FPM	AIR TEMP ENT DB	AIR TEMP ENT WB	AIR TEMP LVG DB	AIR TEMP LVG WB	CHILLED WATER ENT °F	CHILLED WATER LVG °F	GPM	MAX PD FT	TOTAL CAPACITY BTUH
AHU-1	ICP, PREP, INSTR.	PACE A-15 BI	ROOF	5400	4 1/2	15	2403	7 1/2	460/3	—	—	—		—		—	—	—		—		
AHU-2	INORG. OFF. RADLAS	PACE A-16 BI	ROOF	6300	4 1/2	16 1/2	2205	10		36x52	6	13.0	481	91	67	55	53.3	44	59	37.1	3.11	278,156
AHU-3	LUNCH RM, CONF RM	PACE A-15 BI	ROOF	4320	4 1/2	15	2316	7 1/2		36x43	6	10.8	400	77.9	62.0	53	51.5	44	59	14.5	.67	108,415
AHU-4	LIBRARY, INORG OFF.	PACE A-12 BI	ROOF	2600	4 1/2	12 1/4	2822	5		30x37	6	7.1	336	77.5	62	60	55.6	44	59	7.4	3.20	55,478
AHU-5	FIELD OFF, FS SUP	PACE A-15 BI	ROOF	4410	4 1/2	15	2327	7 1/2		36x43	6	10.8	408	77.4	61.8	55	52.5	44	59	15.8	1.96	118,673
AHU-6	MCP SUP, COPY, CLERK	PACE A-15 BI	ROOF	4620	4 1/2	15	2351	7 1/2		36x43	6	10.8	428	77	63.2	59	55.8	44	59	15.1	1.30	113,098
AHU-7	CONF RM TOILETS	PACE A-13 BI	ROOF	3550	4 1/2	13 1/2	2620	5		30x31	[illegible]	7.7	457	78	63	60	55.7	44	59	10.4	5.85	77,932
AHU-9	RECEPTION, MAIL, RK	EXIST. TRANE	ROOF	2480	4 1/2	12 1/4	2196	5 ⑥		18x45 1/2		5.6	443	76.6	61.3	55	52.5	44	59	—	—	62,830
AHU-10	FIELD OFF, SUP, PS LKR	EXIST. TRANE	ROOF	4160	4 1/2	13 1/2	2779	7 1/2 ⑦		30x45 1/2		9.4	443	76.9	61.6	56	52.5	44	59	—	—	109,325
AHU-11	MICROBIOLOGY	PACE A-13 BI	ROOF	3870	4 1/2	13 1/2	2704	7 1/2		30x43	6	9.0	430	91	67	58	54.5	44	59	20.2	3.81	151,510
AHU-12	KITCHEN, CLEAN RM	PACE A-15 BI	ROOF	5210	4 1/2	15	2720	7 1/2		—	—	—	—	—	—	—	—	—	—	—	—	
AHU-13	SAMP RCV, LC/MS, GC/MS	PACE A-24 AF	ROOF	14,200	5 1/2	24 1/4	1106	25		2-28 1/2x77	6	30.5	463	91	67	60	63.9	44	59	22.6	—	171,262
AHU-14	HAZ. MAT	PACE A-12 BI-N	ROOF	1445	5	12 1/4	2360	5		—	—	—	—		—		—	—		—	—	—
AHU-15	V.O.A.	PACE A-12 BI-SWSI	ROOF	1505	5	12 1/4	2620	3		—	—	—	—	—	—	—		—		—		—
AHU-16	OVEN, BALANCE, SPECT.	PACE A-16 BI	ROOF	6220	4	16 1/2	2105	7 1/2		—	—	—	—	—		—	—			—	—	—
AHU-17	SUP. OFFS. TOXICOL.	PACE A-15 BI	ROOF	4445	4	15	2211	5		—	—	—	—				—	—	—	—	—	—
AHU-18	SAMP. STORG, LAB HNG	PACE A-16 BI	ROOF	5250	4	16 1/2	2005	7 1/2		—	—	—	—	—	—	—	—	—	—	—	—	—
AHU-19	FIELD SERV, TOILETS	PACE A-12 BI	ROOF	2875	4	12 1/4	2776	5		—	—	—	—	—	—	—	—	—	—	—	—	—
AHU-8	BIOASSAY	PACE A-20I-SWSI	ROOF	1480	4	12 1/4	2765	3														

TAG	HEATING COIL SIZE	ROW	FACE AREA SF	FACE VEL FPM	AIR TEMP °F ENT DB	AIR TEMP °F LVG DB	HOT WATER ENT °F	HOT WATER LVG °F	GPM	MAX PD FT	CAPACITY BTUH		DEEP BED FILTERS MANUFACTURER & TYPE	NO	SIZE	ODOR CONTROL FILTERS-① MANUFACTURER & MODEL	NO	SIZE	UNIT WEIGHT LBS	REMARKS
AHU-1	36x43	2	10.8	463	34	55	180	150	8.16	0.74	122,472	1	CAMBRIDGE-HI FLOW-65% EFF.	2 / 2	24x12x22 / 24x24x22	PURAFIL MODEL PC	2 / 2	24x12x20 / 24x24x20	6500	③
AHU-2	36x52	2	13	481	34	75	180	150	18.6	1.09	278,964	2		2 / 3	24x24x22 / 24x12x22		2 / 3	24x24x20 / 24x12x20	7500	
AHU-3	—		—	—	—	—	—	—	—	—	—	3		2 / 2	24x24x22 / 24x12x22		2 / 2	24x24x20 / 24x12x20	9000	
AHU-4	30x37	2	7.7	336	64.6	75	180	150	2.0	6.09	29,041	4		1 / 1	24x24x22 / 24x12x22		1 / 1	24x24x20 / 24x12x20	9000	
AHU-5	36x43	2	10.8	408	64.6	82	100	150	5.5	0.42	82,872	5		2 / 2	24x24x22 / 24x12x22		2 / 2	24x24x20 / 24x12x20	9000	
AHU-6	—		—	—	—	—	—	—	—		—	6		2 / 2	24x24x22 / 24x12x22		2 / 2	24x24x20 / 24x12x20	9000	
AHU-7	30x37	2	7.7	457	64	78	180	150	3.5	0.4	53,122	7		1 / 1	24x24x22 / 24x20x22		1 / 1	24x24x20 / 24x20x20	9000	
AHU-9	18x45 1/2		5.61	443	66	80	180	150	2.4		36,426	9		2 ④	24x24x22		2	24x24x22	6500	EXIST. AIR HANDLER ⑤⑥
AHU-10	30x45 1/2		9.4	443	65.1	80	180	150	4.3		64,247	10		2 ④	24x24x22		2	24x24x22	3500	EXIST. AIR HANDLER ⑤⑧
AHU-11	30x43	2	9.0	430	34	78	180	150	12.3	0.51	183,902	11		2	24x24x22		2	24x24x20	6500	
AHU-12	36x43	2	10.8	467	34	55	180	150	7.9	0.76	118,163	12		2 / 2	24x12x22 / 24x24x22		2 / 2	24x12x20 / 24x24x20	3500	
AHU-13	2-28 1/2x77	2	30.5	463	34	55	180	150	21.4	1.21	322,055	13		6 / 2	24x24x22 / 12x24x22		6 / 2	24x24x20 / 12x24x20	11,200	③
AHU-14	25 1/2x22	2	5.0	384	34	66	180	150	3.4	2.42	49,939	14		1 / 1	24x24x22 / 24x12x22		1 / 1	24x24x20 / 24x12x20	2,200	③
AHU-15	25 1/2x26	2	5.0	226	34	55	180	150	2.3	3.49	54,743	15		1	24x24x22		1	24x24x20	2,200	③
AHU-16	36x52	2	13.0	470	34	55	180	150	9.4	1.17	141,067	16		2 / 3	24x24x22 / 24x12x22		2 / 3	24x24x20 / 24x12x20	6000	
AHU-17	—		—	—	—	—	—	—	—	—	—	17		2 / 2	24x24x22 / 24x12x22		2	24x24x20 / 24x12x22	9000	
AHU-18	—		—	—	—	—	—	—	—	—	—	18		2 / 3	24x24x22 / 24x12x22		2 / 2	24x24x20 / 24x12x20	6,000	
AHU-19	30x37	2	7.7	373	34	55	180	150	4.4	0.33	65,205	19		2	24x20x22		2	24x20x20	6000	
AHU-8	25 1/2x20	2	5.0	296	34	54	180	150	2.13	0.74	31,968	8		1	24x24x22			24x24x20	2,200	

① INDICATES W/2" ECO-AIR PLEATED MEDIA PREFILTERS @ 25-30% EFFICIENCY. ALL FILTER WITHIN SIDE ACCESS HOUSINGS.
② PACE MODEL NOS. USED TO ESTABLISH QUALITY. SEE SPECIFICATIONS FOR ALTERNATE MFR'S.
③ PROVIDE WITH ABSOLUTE FILTERS, SEE SCHEDULE SH. M4.3.
④ REPLACE EXISTING FILTERS W/ NEW FILTERS.
⑤ DIRECT EXPANSION COOLING COIL ⑥ REPLACE EXISTING 2HP MOTOR W/ NEW 3HP MOTOR
⑦ REPLACE EXISTING 3HP MOTOR W/ NEW 7 1/2 HP MOTOR. ⑧ REPLACE (E) HEATING COIL CONTROL VALVE & REPLACE BELT & DRIVE
REPLACE BELT & DRIVE ⑨ SOUNDTRAPS AS SCHEDULED TO BE PART OF AIR HANDLING UNIT.

FAN SCHEDULE

TAG	SERVICE	LOCATION	MANUFACTURER MODEL #	TYPE	CFM	S.P. IN. WG	MIN. WH. DIA.	DISCH	OUTLET VEL. FPM	FAN RPM	MOTOR HP	MOTOR V.	MOTOR PH.	MOTOR CY	UNIT WEIGHT LBS.	REMARKS
RF-1	AHU-3	ROOF	PACE PF 20AF	PLUG	3910	1"	20"	—	—	1137	1 1/2	460	3	60	1900	
RF-2	AHU-4	ROOF	PACE PF-15BI	PLUG	2590	1"	15"	—	—	1626	1	460	3	60	1400	
RF-3	AHU-5	ROOF	PACE PF-20AF	PLUG	3750	1"	20"	—	—	1124	1 1/2	460	3	60	1900	
RF-4	AHU-6	ROOF	PACE PF-20AF	PLUG	4060	1"	20"	—	—	1176	2	460	3	60	1900	
RF-5	AHU-7	ROOF	PACE PF-16BI	PLUG	2920	1"	16 1/4"	—	—	1545	1 1/2	460	3	60	1500	
RF-6	AHU-18	ROOF	PACE PF-16BI	PLUG	2830	1"	16 1/4"	—	—	1631	1 1/2	460	3	60	1400	
RF-7	AHU-17	ROOF	PACE PF-15BI	PLUG	2100	1"	15"	—	—	1539	1	460	3	60	1400	
RF-8	AHU-9	ROOF	TWIN CITY 165 BCV	UTILITY	2240	1"	16 1/2"	—	1427	1216	3/4	460	3	60	260	WEATHER PROOFED
RF-9	AHU-10	ROOF	TWIN CITY 200 BCV	UTILITY	3660	1"	20"	—	1591	1004	1 1/2	460	3	60	380	
EF-1	TLTS GEN. EXH	ROOF	TWIN CITY 150 BCV	UTILITY	2150	3/4"	15"	—	1589	1332	3/4	460	3	60	240	
EF-2	GEN. EXH.	ROOF	TWIN CITY 122 BCV	UTILITY	1180	5/8"	12 1/4"	—	1372	1490	1/2	460	3	60	180	
EF-3	CANOPY HOODS GLASS WASH AND OVEN	ROOF	TWIN CITY 222 BCV	UTILITY	4300	3/4"	22 1/4"	—	1509	847	1 1/2	460	3	60	380	
EF-4	GEN. EXH FIELD SERVICE	ROOF	TWIN CITY 182 BCV	UTILITY	2750	1"	18 1/4"	—	1432	1076	1	460	3	60	340	
EF-5	SAMPLE GEN. EXH.	ROOF	TWIN CITY 75 FCJ	UTILITY	300	1/2"	7 11/16"	—	923	1154	1/6	120	1	60		
EF-6	INORG. CHEM. CANOPY HOOD	ROOF	TWIN CITY 150 BCV	UTILITY	2000	3/4"	15"	—	1550	1313	3/4	460	3	60	240	
EF-7	INORG. CHEM. CANOPY HOOD	ROOF	TWIN CITY 150 BCV	UTILITY	2000	3/4"	15"	—	1550	1313	3/4	460	3	60	240	
EF-8	MICRO BIOLOGY	ROOF	TWIN CITY 182 BCV	UTILITY	2820	3/4"	18 1/4"	—	1409	1018	3/4	460	3	60	335	
EF-9	MEDIA KITCHEN CANOPY HOOD	ROOF	TWIN CITY 150 BC	UTILITY	2000	3/4"	15"	—	1550	1313	3/4	460	3	60	240	
EF-10	MICROSCOPY GEN. EXH.	ROOF	TWIN CITY 105 BCJ	UTILITY	750	3/4"	10 1/2"	—	1172	1607	1/4	120	1	60	125	
EF-11	FLAVOR PROFILE GEN. EXH.	ROOF	TWIN CITY 122 BCV	UTILITY	1050	5/8"	12 1/4"	—	1221	1349	1/3	120	1	60	190	
EF-13	PREP LAB CANOPY HOOD	ROOF	TWIN CITY 105 BCJ	UTILITY	600	3/4"	10 1/2"	—	938	1466	1/4	120	1	60	125	
EF-14	BIOASSAY	ROOF	TWIN CITY 122 BCV	UTILITY	1300	3/4"	12 1/4"	—	1512	1582	1/2	460	3	60	200	
EF-15	ICP	ROOF	TWIN CITY 150 BCV	UTILITY	2550	1"	15"	—	2006	1312	1 1/2	460	3	60	240	
EF-16	GAS CYL	ROOF	TWIN CITY 122 BCV	UTILITY	1000	3/8"	12 1/4"	—	1163	1178	1/4	120	1	60	190	

SOUND TRAP SCHEDULE

TAG	SYSTEM SERVED	CFM	IAC TYPE	TRAP AREA SF	DESIGN FACE VEL. FPM	OVERALL SIZE W" x D" x L"	MAX PD IN W.G.	REMARKS
ST-1	AHU-1	5400	3 MS	12.0	417	48 x 36 x 36	0.06	①
ST-2	AHU-2	6300	3 MS	15.0	417	60 x 36 x 36	0.06	
ST-3	AHU-3	4320	3 MS	12.0	360	48 x 36 x 36	0.06	
ST-4	RF-1	3910	3 MS	15.0	261	60 x 36 x 36	0.05	
ST-5	AHU-4	2600	3 MS	10.5	247	42 x 36 x 36	0.05	
ST-6	RF-2	2590	3 MS	12.0	216	48 x 36 x 36	0.04	
ST-7	AHU-5	4410	3 MS	12.0	368	48 x 36 x 36	0.06	
ST-8	RF-3	3750	3 MS	15.0	250	60 x 36 x 36	0.05	
ST-9	AHU-6	4620	3 MS	12.0	385	48 x 36 x 36	0.06	
ST-10	RF-4	4060	3 MS	15.0	271	60 x 36 x 36	0.05	
ST-11	AHU-7	3550	3 MS	10.5	335	42 x 36 x 36	0.06	
ST-12	RF-5	2920	3 MS	12.0	243	48 x 36 x 36	0.05	
ST-13	AHU-8	1480	3 MS	6.0	247	36 x 24 x 36	0.06	
ST-14	AHU-9	2480	3 MS	—	—	— —	—	EXISTING UNIT
ST-15	AHU-10	4160	3 MS	—	—	— —	—	EXISTING UNIT
ST-16	AHU-11	3870	3 MS	10	387	48 x 30 x 36	0.06	
ST-17	AHU-12	5210	3 MS	12	420	48 x 36 x 36	0.06	
ST-18	AHU-13	14,200	3 MS	35.0	406	84 x 60 x 36	0.06	
ST-19	AHU-14	1445	3 MS	6.0	320	36 x 24 x 36	0.06	
ST-20	AHU-15	1505	3 MS	6.0	188	36 x 24 x 36	0.06	
ST-21	AHU-16	6220	3 MS	15.0	407	60 x 36 x 36	0.06	
ST-22	AHU-17	4445	3 MS	10.0	431	40 x 30 x 36	0.06	
ST-23	RF-6	2830	3 MS	5.0	566	48 x 15 x 36	0.09	
ST-24	AHU-18	5250	3 MS	12.0	430	48 x 36 x 36	0.06	
ST-25	RF-7	2100	3 MS	15.0	140	60 x 36 x 36	0.05	
ST-26	AHU-19	2875	3 MS L	10.5	274	42 x 30 x 36	0.04	

① BLANK UNUSED PORTION OF PLENUM.
② SOUND TRAPS TO BE PART OF AIR HANDLING UNIT/FACTORY INSTALLED.

CHILLER SCHEDULE

TAG	LOCATION	CAPACITY IN TONS	EVAPORATOR GPM	EVAPORATOR ENT. °F	EVAPORATOR LVG °F	EVAPORATOR PD. FT.	FOULING FACTOR	CFM	AMB. AIR °F	AIR COOLED CONDENSER FAN NO.	FLA. EA	VOLT	PHASE	HZ	COMPRESSORS NO.	KW INPUT	RLA EA	LRA EA	VOLT	PHASE	HZ	UNIT ELECTRICAL CHARACTERISTICS MCA	MOCP	ICF	VOLTS	PHASE	HZ	UNIT OPERATING WEIGHT	REMARKS
1	NEW ROOF	199.4	319	59	44	9.2	0.00025	17,600	95°	12	3.0	460	3	60	8	239.2	51.0	253	460	3	60	457	500	654	460	3	60	15,100 LBS.	U.L. LISTED
2	NEW ROOF	11.2	27.0	68	58	12.5	0.0009	10,150	95°	2	1.8	460	3	60	1	11.5	19.5	96	460	3	60	—	35	104.8	460	3	60	581 LBS	UL. LISTED ①

RLA = RATED LOAD AMPS; LRA = LOCKED ROTOR AMPS; MCA = MIN. CIRCUIT AMPS; MOCP = MAX. OVERCURRENT PROTECTIVE DEVICE AMPS; ICF = MAX. INSTANTANEOUS CURRENT FLOW.
① WITH OPTIONAL HEAD PRESSURE CONTROL TO 60 °F AMBIENT TEMPERATURE.

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Architect Reg. No.

EBMUD LAB EXPANSION PROJECT SD-185

EAST BAY
MUNICIPAL
UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG.
R.P.E. NO. C 39959

EBMUD PROJECT MGR.
R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES
R.P.E. NO C 33317

EBMUD MGR. OF WASTEWATER
R.P.E. NO. C 30976

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Issuances and Revisions

No.	Date	Description
0	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 2
	2-19-96	26 AUG 94 AS BUILT

Date 7/29/91

Sheet Title

SCHEDULES

Project No. 9002

M 4.1 | 0

Sheet No 111/178 | Revision

OK 9/19/96

AIR OUTLET SCHEDULE

TAG △	SERVICE	CARNES MODEL NO (J.O.N)	DESCRIPTION	REMARKS
A	SUPPLY	SPEA	PERFORATED FACE, SQUARE OR RECT. NECK FRAME #4 FOR 24x24 LAY-IN APPLICATION, ADJUSTABLE PATTERN CONTROLLER	W/KXPA OPPOSED BLADE DAMPER
B	RETURN/EXHAUST	SPPA	PERFORATED FACE, SQUARE NECK, FRAME NO 4 FOR 24x24 LAY-IN APPLICATION.	" " " "
C	SUPPLY	SKFA **	STAMPED LOUVER DIFFUSER, F-FRAME, SQUARE NECK, SURFACE MOUNTED, KXGA EQUALIZING DEFLECTOR	W/KXKA OPPOSED BLADE DAMPER
D	RETURN/EXHAUST	RTAAH	HORIZONTAL FIXED BLADE REGISTER W/ HORIZONTAL FACE BARS AT 45°	W/OPPOSED BLADE DAMPER
E	SUPPLY	RTDAH	DOUBLE DEFLECTOR REGISTER HORIZONTAL FACE BARS.	W/OPPOSED BLADE DAMPER
F	SUPPLY	RMD-*PD*	24"x24" LAY-ON MODULAR 4 CORE SQUARE DIRECTIONAL DIFFUSER, W/ FILTER PANEL	

* ANEMOSTAT OR EQUAL
** AT EXPOSED DUCTS USE 'B' FRAME

EQUIPMENT VIBRATION ISOLATION SCHEDULE

SYSTEM No	DESCRIPTION	ISOLATOR TYPE DETAIL	N.	FRAME TYPE	DEFLECTION (INCH)	SEISMIC RESTRAINT QUANTITY	SEISMIC RESTRAINT DETAIL No	REMARKS
B-1 & B-2	BOILERS	PM (11/M7.1)		--	1/4"	750 DET.	65. DET.	
CH-1	CHILLERS	MS (11/M7.1)	6	A (2/M7.2)	2 1/2"	8	1/M7.2	
P-1, P-2	PUMPS	MS (9/M7.1)	4	B (9/M7.2)	2 1/2"	4	1/M7.2	
P-3, P4	PUMPS	MS (9/M7.1)	4	B (9/M7.2)	2 1/2"	4	1. M7.2	
AHU-1 THRU-7 & 11 THRU-19	AIR HANDLING UNITS	—	-	B (2/M7.2)*	2 1/2"	—	4 M7.2	INTERNAL FAN ISOLATORS & SEISMIC RESTRAINT W/ UNITS.
HP-2(E)	HEAT PUMP	MS (4/M7.1)	4	B (2/M7.2)	2 1/2"	4	1/M7.2	
EF/FEF	EXHAUST FANS	MS (9/M7.1)	4	B (2/M7.2)	1"	4	1. M7.2	FOR ALL EXHAUST FANS AND FUME HOOD EXHAUST FANS.
P5, P-6	PUMPS	MS (9/M7.1)	4	B (9/M7.2)	2 1/2"	4	1/ M7.2	
CH-2	CHILLER	MS (11/M7.1)	4	A (2/M7.2)	2 1/2"	4	1/ M7.2	
TOP	AIR COMPRESSOR	MS (5/M7.2)	4	B (1/M9.2)	2 1/2"	4	1/ M9.2	

* FRAME ONLY WITHOUT ISOLATOR SUPPORT FRAME.
TEMP-C AIR COMPRESSOR

PUMP SCHEDULE

TAG No	LOCATION	SERVICE	OPER TEMP °F	GPM	PUMP HEAD FT.H₂O	SIZE	RPM	MOTOR * HP	MOTOR * VOLTS	MOTOR * PH/CY	MANUFACTURER AND MODEL NO.
1	ON GRADE	HEATING HOT WATER	180°	144	75	2"x1 1/2"	1750	7 1/2	460	3/60	B&G 1510-2 1/2 BB WEATHERPROOFED
2	ON GRADE	HEATING HOT WATER	180°	144	75	2"x1 1/2"	1750	7 1/2	460	3/60	B&G 1510 2 1/2 BB WEATHERPROOFED
3	ROOF	CHILLED WATER	44°	160	85	3"x2 1/2"	1750	7 1/2	460	3/60	B&G 1510-2 1/2 BB WEATHERPROOFED
4	ROOF	CHILLED WATER	44°	160	85	3"x2 1/2"	1750	7 1/2	460	3/60	B&G 1510-2 1/2 BB WEATHERPROOFED
5	ROOF	EQUIP. COOLING WATER (ECW)	58°	27	81	1 1/2"x1 1/4"	1750	2	460	3/60	B&G 1531-1 1/4 BC WEATHERPROOFED
**6	ROOF	EQUIP. COOLING WATER (ECW)	58°	27	81	1 1/2"x1 1/4"	1750	2	460	3/60	B&G 1531-1 1/4 BC WEATHERPROOFED

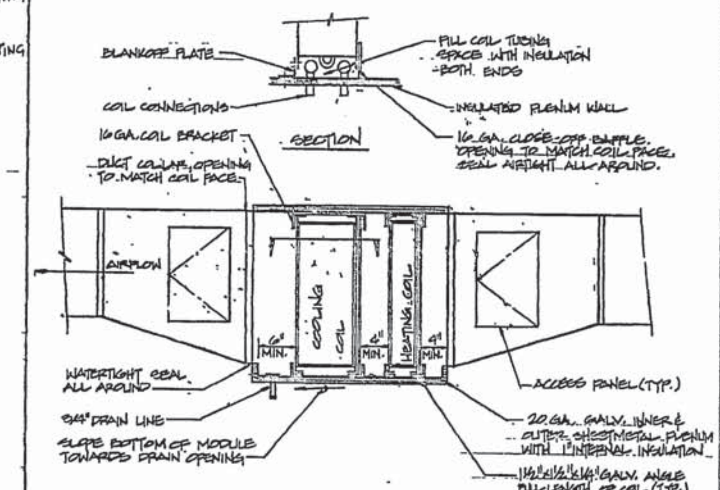
* TEFC HIGH EFFICIENCY
** STAND BY

BOILER SCHEDULE

TAG No	LOCATION	HOT WATER MBH INPUT	HOT WATER MBH OUTPUT	GAS TYPE	GAS CFH	WATER ENT °F	WATER LVG °F	WATER GPM	HEATING SURFACE SQ. FT.	OPERATING WEIGHT LBS.	MANUFACTURER AND MODEL NO.
1	ON GRADE	2700	2160	NATURAL	2700	150	180	144	322	4100	BRYAN CL-270 WEATHERPROOFED
2	ON GRADE	2700	2160	NATURAL	2700	150	180	144	322	4100	BRYAN CL-270 WEATHERPROOFED

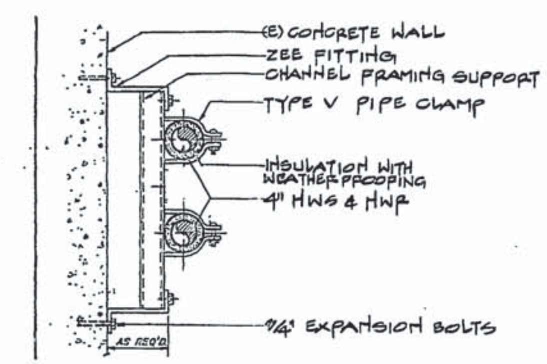
TEMPERATURE CONTROL VALVE SCHEDULE

TAG	EQUIPMENT SERVED	SERVICE	GPM	P.D. PSIG. MAX	PNEUMATIC TYPE
1.	AHU-1	HTG HOT WATER	7.6	1	2 WAY MODULATING
2.	AHU-2	HTG HOT. WATER	18.5	1	" "
3.	AHU-2.	CHILLED WATER	37.1	4	3 WAY MODULATING
4.	AHU-3	CHILLED WATER	14.1	3	"
5.	AHU-4	HTG HOT WATER	2.0	1	2 WAY
6.	AHU-4	CHILLED WATER	7.4	3	3 WAY
7	AHU-5	HTG HOT WATER	5.5	1	2 WAY
8	AHU-5	CHILLED WATER	15.5	4	3 WAY
9.	AHU-6	CHILLED WATER	15.1	4	3 WAY
10	AHU-7	HTG HOT WATER	3.5	1	2 WAY
11	AHU-7	CHILLED WATER	10.4	4	3 WAY
12	AHU-9	HTG HOT WATER	2.4	1	2 WAY
13	AHU-9	DX COIL			
14	AHU-10	HTG HOT WATER	4.3	1	2 WAY
15	AHU-10	DX COIL			
16	AHU-11	HTG HOT WATER	12.3	1	2 WAY
17	AHU-11	CHILLED WATER	20.2	4	3 WAY
18	AHU-12	HTG HOT WATER	7.6	1	2 WAY
19	AHU-13	HTG HOT WATER	21.4	1	3 WAY
20	AHU-14	HTG. HOT WATER	4.15	1	2 WAY
21	AHU-15	HTG. HOT WATER	1.9	1	2 WAY
22	AHU-16	HTG. HOT WATER	9.3	1	2 WAY
23	AHU-19	HTG. HOT WATER	4.4	1	2 WAY
24	AHU-8	HTG. HOT WATER	2.13	1	2 WAY



(1/M4.2) **COIL MODULE DETAIL**

NOT TO SCALE



(2/M4.2) **MULTIPLE PIPE WALL BRACKET**

NOT TO SCALE

SHEET NOTES:

1- FOR GENERAL NOTES SEE DRAWING M.1.1

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EBMUD LAB EXPANSION PROJECT SD-185

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EBMUD PROJECT ENG. R.P.E. NO. C 39959
EBMUD PROJECT MGR. R.P.E. NO. C 31965
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30978

REGISTERED PROFESSIONAL ENGINEER WATARU TAKAHASHI No. 11242 MECHANICAL STATE OF CALIFORNIA

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Issuances and Revisions

No.	Date	Description
△	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 4
	2-22-96	26 AUG 94 AS BUILT

Date 7/29/91

Sheet Title

SCHEDULES

Project No. 9002

M 4.2 | 0

Sheet No. 112/178 Revision

USER: RGA DATE: 2-22-96 FILE: /SD185/MECH/M4.2.DGN

GK 9/19/96

COIL MODULE SCHEDULE

TAG (CM) CC / HC	SYSTEM SERVED	TYPE	SIZE	NO ROWS / F.P.I	CFM	AIR TEMP °F ENTERING DB	ENTERING WB	LEAVING DB	LEAVING WB	TOTAL FACE S.F.	FACE VEL. FPM	MAX PD IN W.G.	WATER GPM	WATER P.D FT.	WATER ENT. °F	WATER LVG °F	TOTAL CAPACITY BTUH	REMARKS
CC-1	AHU-17	③	15×9	6/10	380	83.5	64	55	52.3	0.94	404	0.51	1.75	3.55	44	59	13150	
HC-1	AHU-17			1/10		51.5	-	80				0.07	0.78	0.11	180	150	11696	
CC-2	AHU-17		18×12	6/10	570	83.5	64	55	52.3	1.5	380	0.45	2.63	1.57	44	59	19725	2 CIRCUITS
HC-2	AHU-17			1/8		51.5	-	80	-			0.05	1.17	0.33	180	150	17545	
CC-3	AHU-17		12×6	6/8	120	83.5	64	55	52.3	0.5	220	0.15	0.51	0.27	44	59	3807	
HC-3	AHU-17			1/8		51.5	-	75	-			0.02	0.50	0.03	180	168.8	2792	
CC-4	AHU-17		24×15	6/10	1,180	83.5	64	55	52.3	2.5	472	0.66	5.49	8.86	44	59	40834	2 CIRCUITS
HC-4	AHU-17			1/8		51.5	-	75	-			0.08	2.0	1.24	180	150	29948	
CC-5	AHU-17		21×12	6/10	990	83.5	64	55	52.3	1.75	497		4.01		44	59	30106	
HC-5	AHU-17			1/8		51.5	-	80	-				2.03		180	150	30,472	
CC-6	AHU-17		12×6	6/8	120	83.5	64	55	52.3	0.5	220	0.15	0.51	0.27	44	59	3807	
HC-6	AHU-17			1/8		51.5	-	75	-			0.02	0.5	0.03	180	168.8	2792	
CC-7	AHU-17		18×12	6/10	690	83.5	64	55	52.3	1.5	460	0.59	3.18	2.38	44	59	23877	
HC-7	AHU-17			1/8		51.5	-	80	-			0.07	1.42	0.46	180	150	21238	
CC-8	AHU-17		15×9	6/10	395	83.5	64	55	52.3	0.94	420	0.54	1.83	3.80	44	59	13669	
HC-8	AHU-17			1/10		51.5	-	80	-			0.08	0.81	0.12	180	150	12158	
CC-9	AHU-13		18×12	6/8	610	80.0	63.5	59	55.2	1.5	407	0.34	1.02	2.17	44	59	15372	
HC-9	AHU-13			1/8		55	-	74	-			0.06	0.84	0.18	180	150	12517	
CC-10	AHU-13		12×6	6/8	210	80.0	63.5	55	52.5	0.5	420	0.61	.45	1.77	44	59	6813	
HC-10	AHU-13			1/8		55	-	80	-			0.06	0.5	0.03	180	157	5670	
CC-11	AHU-13		15×9	6/10	400	80.0	63.5	55	52.5	0.94	426	0.57	.06	6.06	44	59	12978	
HC-11	AHU-13			1/8		55	-	80	-			0.07	0.72	0.09	180	150	10800	
CC-12	AHU-13		30×18		1900	80.0	63.5	59	55.2	3.75	427	0.60	3.19		44	59	47880	
HC-12	AHU-13					55	-	74	-				2.6		180	150	30,386	
CC-13	AHU-13		42×18	6/8	2440	80.0	63.5	56	51.5	5.25	465	0.42	3.0	2.27	44	59	45457	
HC-13	AHU-13			1/8		55	-	74	-			0.07	3.34	0.73	180	150	50069	2 CIRCUITS
CC-14	AHU-13		15×12	4/8	600	80.0	63.5	70	60	1.25	480	0.44	.44	0.85	44	59	6694	
HC-14	AHU-13			1/8		55	-	74	-			0.08	.82	0.16	180	150	12312	
CC-15	AHU-13		24×15	6/8	1180	80.0	63.5	58	54.4	2.5	472	0.43	2.1	3.70	44	59	32284	
HC-15	AHU-13			1/8		55	-	74	-			0.08	1.61	0.85	180	150	24214	3 WAY MOD. VALVE
CC-16	AHU-14		21×12	6/8	820	91	67	64	57.7	1.75	469	0.43	3.29	2.70	44	59	24686	
HC-16	AHU-14			1/8		64	-	74	-			0.07	0.59	0.11	180	150	8856	
CC-17	AHU-15		18×12	6/10	630	91	67	55	52.7	1.5	420	0.54	3.69	3.09	44	59	27698	
HC-17	AHU-15			1/8		55	-	75	-			0.06	0.91	0.21	180	150	13608	
CC-18	AHU-19		18×12	6/8	735	91	67	58	54.7	1.5	490	0.46	3.78	3.23	44	59	28378	2 CIRCUITS
HC-18	AHU-19			1/8		55	-	75	-			0.08	1.06	0.26	180	150	15876	
CC-19	AHU-19		18×9	6/8	500	91	67	64	57.8	1.12	447	0.39	1.99	0.77	44	59	14918	2 CIRCUITS
HC-19	AHU-19			1/8		55	-	75	-			0.07	0.72	0.10	180	150	10800	
CC-20	AHU-19		36×15	6/10	1640	91	67	55	52.7	3.75	437	0.57	9.61	2.59	44	59	72103	
HC-20	AHU-19			1/8		55	-	80	-			0.07	2.95	3.12	180	150	44200	
CC-21	AHU-18		24×12	6/10	900	84	64.5	55	52.7	2.0	450	0.62	4.23	4.51	44	59	31752	
HC-21	AHU-18			1/10		49	-	83	-			0.08	2.2	1.16	180	150	33048	
CC-22	AHU-18		12×7	6/12	300	84	64.5	55	52.7	0.75	400	0.74	1.41	2.06	44	59	10584	
HC-22	AHU-18			1/12		49	-	80	-			0.11	0.67	0.05	180	150	10044	
CC-23	AHU-18		12×6	6/10	155	84	64.5	55	52.7	0.5	310	0.31	0.73	0.51	44	59	5468	
HC-23	AHU-18			1/8		49	-	76	-			0.04	0.5	0.03	180	162	[illegible]	
CC-24	AHU-18	③	15×9	6/10	400	98.5	64.5	55	52.7	0.74	429	0.6	1.05	4.80		59	12400	
HC-24	AHU-18			1/10		49	-	76	-			0.02	0.73	0.12	180	150	11,664	
CC-25	AHU-18		12×6	8/8	240	84	64.5	[illegible]	[illegible]	0.5	180	[illegible]	1.13	1.49	44	59	[illegible]	
HC-25	AHU-18			1/10		61	-	[illegible]	-			0.09	[illegible]	0.03	180	157	6998	
CC-26	AHU-18		12×9	6/10	280	84	64.5	55	52.7	0.75	373	0.45	1.32	1.95	44	59	9878	
				-		-	-	-	-			-		-	-	-	-	
CC-27	AHU-18		18×9	6/8	306	84	64.5	55	52.7	1.12	438	0.48	2.31	6.25	44	59	17287	
HC-27	AHU-18			1/10		49	-	80	-			0.08	1.12	0.21	180	150	16,740	3-WAY MOD. VALVE
CC-28	AHU-18		24×15	6/10	1265	84	64.5	55	52.7	2.5	502	0.74	5.9	10.20	44	59	44776	
HC-28	AHU-18			1/8		49	-	76	-			0.08	2.49	1.76	180	150	36596	
CC-29	AHU-18		24×12	6/10	900	84	64.5	55	52.7	2	450	0.62	4.23	4.51	44	59	31752	
HC-29	AHU-18			1/8		49	-	78	-			0.07	1.88	0.86	180	150	28188	
CC-30	AHU-18		12×9	6/10	280	84	64.5	55	52.7	0.75	373	0.45	1.32	1.95	44	59	9878	
HC-30	AHU-18			1/10		49	-	78	-			0.06	0.59	0.06	180	150	8770	
CC-31	AHU-18		12×9	6/8	260	84	64.5	55	52.7	0.75	347	0.33	1.22	1.71	44	59	9173	
HC-31	AHU-18			1/10		49	-	80	-			0.06	0.58	0.06	180	150	8705	3-WAY MOD. VALVE
CC-32	AHU-16		36×15	6/8	1600	91	67	55	55.3	3.75	430	0.47	7.11	2.5	44	59	72550	
HC-32	AHU-16			1/8		55	-	76	-			0.08	2.2	1.5	80	150	41000	
CC-33	AHU-16		21×12	4/8	800	91	67	65	53.1	1.75	457	0.41	3.09	2.41	44	59	23148	
HC-33	AHU-16			1/8		55	-	73	-			0.07	1.04	0.29	180	50	15552	
CC-34	AHU-16		21×12	6/10	855	91	67	55	52.7	1.75	489	0.69	5.01	5.69	44	59	37590	
HC-34	AHU-16			1/8		55	-	75	-			0.08	1.11	0.32	180	150	16621	
CC-35	AHU-16		21×12	6/10	855	91	67	55	52.7	1.75	489	0.69	5.01	5.69	44	59	37590	
HC-35	AHU-16			1/8		55	-	73	-			0.08	1.11	0.32	180	150	16021	
CC-36	AHU-16		24×12	6/8	900	91	67	59	55.3	2	450	0.40	4.93	4.29	44	59	33251	
HC-36	AHU-16			1/8		55	-	73	-			0.07	1.17	0.38	180	150	17496	
CC-37	AHU-8		18×12	6/12	650	91	67	54	51.9	1.5	433	0.67	4.0	3.55	44	59	29952	
HC-37	AHU-8			1/8		54	-	68	-			0.07	0.66	0.12	180	150	9828	
CC-38	AHU-8		21×12	6/8	830	91	67	58	54.5	1.75	474	0.43	4.33	4.40	44	59	32495	
HC-38	AHU-8			1/8		54	-	80	-			0.03	1.57	0.58	180	150	23606	
CC-39	AHU-1		42×15	6/8	1860	91	67	57.2	54.2	4.87	382	0.36	9.91	2.99	44	54	74326	
HC-39	AHU-1			1/8		55	-	75	-			0.06	2.68	2.90	180	150	40176	3-WAY MOD. VALVE
CC-40	AHU-1		21×12	6/8	800	91	67	57.2	54.2	1.75	457	0.41	4.26	4.27	44	59	31968	
HC-40	AHU-1			1/8		55	-	75	-			0.07	1.15	0.34	180	150	17280	
CC-41	AHU-1		21×15	6/8	1040	91	67	57.2	54.2	2.19	477	0.44	5.55	8.32	44	59	41600	
HC-41	AHU-1			1/8		55	-	75	-			0.08	1.5	0.71	180	150	22464	
CC-42	AHU-12		21×15	6/8	1020	91	67	58	54.5	2.19	[illegible]	0.42	5.32	7.96	44	59	39933	
HC-42	AHU-12			1/8		55	-	75	-			0.08	1.47	0.67	180	150	22032	
CC-43	AHU-12		42×15	6/8	2140	91	67	58	54.5	4.87	439	0.46	11.17	3.70	44	59	83781	
HC-43	AHU-12			1/8		55	-	75	-			0.08	3.08	3.71	180	150	46224	
CC-44	AHU-12		21×15	6/8	1050	91	67	58	54.5	2.19	479	0.44	5.48	8.58	44	59	41108	
HC-44	AHU-12			1/8		55	-	75	-			0.08	1.51	0.71	180	150	22680	

① TEMPERATURE CONTROL VALVES FOR CHILLED WATER COILS SHALL BE 3WAY PNEUMATIC MODULATING TYPE, 4PSIG MAX PRESSURE DROP.
② TEMPERATURE CONTROL VALVES FOR HEATING HOT WATER COILS SHALL BE 2WAY PNEUMATIC MODULATING TYPE (U.O.N. ON WATERFLOW DIAGRAM), 1 PSIG MAX PRESSURE DROP.
③ "PACE" TYPE CW FOR COOLING COILS & HW FOR HEATING COILS OR APPROVED EQUAL.

BUILDING (E)

PRE CHARGED EXPANSION TANK SCHEDULE

TAG	SERVICE	LOCATION	GAL.	MANUFACTURER MODEL No	SIZE DIA×L (IN)	MAX. OPER PRESS PSIG	FILL PRESSURE PSIG	OPERATING WEIGHT	REMARKS
ET-1	HEATING WATER	GRADE	44.4	B&G D-100V	16¼"⌀×69"H	30	15	570 LBS	ASME CODED TANK@125 PSIG ①
ET-2	CHILLED WATER	ROOF	33.6	B&G D-60V	16⅜"⌀×58"H	30	7	450 LBS	" " ②
ET-3	RECIRCULATING COOLING WATER	ROOF	10.9	B&G D-20	12"⌀×25⅜"L	30	7	150 LBS	

① ACCEPTANCE – 22.2 GALS. – VERTICAL TANK.
② ACCEPTANCE – 11.1 GALS. – VERTICAL TANK.
③ ACCEPTANCE – 2.5 GALS. – HORIZONTAL TANK

ABSOLUTE FILTER SCHEDULE

TAG (F)	UNIT SERVED	CFM	NO FILTERS	SIZE EACH	INIT. P.D. IN.WG	EFFICIENCY	REMARKS
1	AHU-13	14200	6 5 1	24×24×12 24×24×12 12×12×12	.98	99.97%	
2	AHU-14	1445	2	24×24×12	.65	99.97%	
3	AHU-15	1505	1	30×24×11½	.65	99.97%	

SHEET NOTES:

1- FOR GENERAL NOTES SEE DRAWING M.1.1

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EBMUD PROJECT MGR. R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

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Issuances and Revisions

No.	Date	Description
△	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 2&4
	2-27-96	AS BUILT

Date 7/29/91

Sheet Title

SCHEDULES

Project No. 9002

M 4.3 | Revision 0

Sheet No. 113/178

USER: RGA
DATE: 2-27-96
FILE: /USR2/SD185.MECH/M4.3.DGN

OK 7/17/96 King

FUME HOOD EXHAUST FAN SCHEDULE

TAG (FH)	HOOD SERVED	MANUFACTURER & MODEL #	TYPE	CFM	SP IN WG	MIN WHEEL DIA	DISCH	OUTLET VEL. FPM	FAN RPM	MOTOR HP	MOTOR V	MOTOR PH	MOTOR HZ	UNIT WEIGHT LBS	REMARKS
1	FH-1	TWIN CITY 122 BCV	BELT DRIVEN UTILITY	1250	1½"	12½"	BAU	1453	1849	¾	460	3	60	225	TYPE A CORROSION RESISTANT CONSTRUCTION
2	FH-2	TWIN CITY 122 BCV		1250	1½"	12½"	BAU	1453	1849	¾	460	3	60	225	
3	FH3 THRU FH8	TWIN CITY 300 BCV		8400	1½"	30"	BAU	1629	769	5	460	3	60	900	
4	FH-9	TWIN CITY 105 BCI		760	1½"	10½"	BAU	1188	1998	½	460	3	60	150	
5	FH-10	TWIN CITY 122 BCV		1250	1½"	12½"	BAU	1453	1849	¾	460	3	60	225	
6	FH-11, FH-12	TWIN CITY 182 BCV		2960	1½"	18½"	BAU	1542	1049	1½	460	3	60	400	
7	FH-13	TWIN CITY 135 BCV		1710	1½"	13½"	BAU	1629	1758	1	460	3	60	285	
8	FH-14	TWIN CITY 122 BCV		1000	1½"	12½"	BAU	1163	1730	½	460	3	60	225	
9	FH-15	TWIN CITY 105 BCI		760	1½"	10½"	BAU	1188	1998	½	460	3	60	150	
10	FH-16	TWIN CITY 182 BCV		1000	1½"	12½"	BAU	1163	1720	½	460	3	60	225	
11	FH-17	TWIN CITY 122 BCV		1250	1½"	12½"	BAU	1453	1849	¾	460	3	60	225	
12	FH-18 FH-20	TWIN CITY 135 BCV		1760	1½"	13½"	BAU	1676	1782	1	460	3	60	285	
13	FH-21	TWIN CITY 122 BCV		1000	1½"	12½"	BAU	1163	1730	½	460	3	60	225	
14	FH-22	TWIN CITY 182 BCV		950	1⅝"	10½"	BAU	1188	1998	¾	460	3	60	150	
15	FH-23	TWIN CITY 122 BCV		1250	1½"	12½"	BAU	1453	1849	¾	460	3	60	225	
16	FH-24	TWIN CITY 165 BCV		2500	1½"	16½"	BAU	1592	1423	1½	460	3	60	375	

① TWIN CITY MODEL HAS USED TO ESTABLISH QUALITY. SEE SPECIFICATIONS FOR ALTERNATE MANUFACTURERS.

* CANOPY HOODS (FOR INFORMATION ONLY)

TAG (CH)	LOCATION	SIZE	CFM	REMARKS
1	OVEN ROOM	25'6 x 4' DP	1750	EF-3
2	GLASS WASH	25'6 x 4' DP	1750	EF-3
3	INORGANIC CHEM.	12'6 x 3' DP	2000	EF-6
4	INORGANIC CHEM.	12'6 x 3' DP	2000	EF-7
5	MEDIA KITCHEN	13'6 x 4' DP	2000	EF-9
6	PREP. LAB	5'6 x 2'6" DP	600	EF-13
7	SPECT.	25'-6 x 4' DP	600	EF-3

* SEE ARCHITECTURAL DRAWINGS

* FUME HOOD SCHEDULE (FOR INFORMATION ONLY)

TAG (FH)	LOCATION	SIZE LENGTH FEET	TYPE	EXHAUST CFM	PRESS. DROP IN WG.	MAKE UP AIR CFM	REMARKS
1	HAZ. MAT.	6 FT	AUXILIARY AIR	1250	.375	625	FEF-1
2	CLSA	6 FT	AUXILIARY AIR	1250		600	FEF-2
3	SAMPLE. CON. & CLEAN	6 FT	AUXILIARY AIR	1250		875	FEF-3
4	SAMPLE. CON & CLEAN	8 FT		1710		1200	
5	EXTRACTION	6 FT		1250		875	
6		6 FT		1250		875	
7		6 FT		1250		875	
8		8 FT		1710		1200	
9	LIQUID INSTRUMT	4 FT	BYPASS	760		—	FEF-4
10	V.O.A	6 FT	AUXILIARY AIR	1250		875	FEF-5
11	GC	6 FT	BYPASS	1250		—	FEF-6
12	LC. MS.	8 FT		1710		—	FEF-6
13	GLASS WASH	8 FT	AUXILIARY AIR	1710		1200	FEF-7
14	SAMPLE & RECEIVING	5 FT	BYPASS	1000		—	FEF-8
15	MICROBIO.	4 FT		760		—	FEF-9
16	CLEAN ROOM	5 FT		1000		—	FEF-10
17	MICROSCOPY	6 FT		1250		—	FEF-11
18	PREP. LAB	5 FT	AUXILIARY AIR	1000		700	FEF-12
19	PREP LAB	5FT	PERCHLORIC ACID	1900		—	SCRUBBER, SEE DETAIL
20	INSTRUMENT	4 FT	BYPASS	760		—	FEF-12
21	I.C.P.	5 FT	BYPASS	1000		—	FEF-13
22	RADIOLOGY	4 FT	BYPASS	960		—	FEF-14 WITH CARBON FILTER
23	INORG. LAB	6 FT	BYPASS	1250		—	FEF-15 AC-DIGESTION
24	INORG. LAB	12 FT	BYPASS	2500		—	FEF-16

* SEE ARCHITECTURAL SPECIFICATIONS.

REHEAT COIL SCHEDULE

TAG (RH)	EXIST. DESIGNATION	SYSTEM	MANUFACTURER & MODEL #	SIZE	NO ROWS / FPI	CFM	AIR TEMP °F ENT °F	AIR TEMP °F LVG °F	TOTAL FACE AREA S.F.	FACE VEL. F.P.M.	MAX F.P. IN. WG	① WATER GPM	WATER PD	WATER ENT °F	WATER LVG °F	TOTAL CAPACITY BTUH.	REMARKS
1	HC-19	AHU-2	EXISTING	30 x 14	1/2	4160	63.5	80	2.9	1435	0.02	0.65	0.2	180	160	64800	② REPLACE (E) TCV VALVE
2	HC-18	AHU-3	EXISTING	24 x 12	1/2	810	63.5	80	2.0	405	0.06	1.44	0.54	180	160	14484	②
3	—	AHU-3		21 x 12	1/2	880	63.5	80	1.75	474	0.08	1.5	0.55	180	160	14791	②
4	—	AHU-3		42 x 15	1/2	1990	63.5	85	4.81	409	0.01	4.62	0.13	180	160	46201	②
5	HC-15	AHU-10	EXISTING	45 x 13	1/2	3360	65	82	5.63	597	0.11	6.71	2.25	180	160	61640	② REPLACE (E) TCV VALVE
6	HC-16	AHU-10	EXISTING	12 x 12	1/2	400	65	82	1.0	400	0.06	0.73	0.12	180	160	7344	②
7	HC-17	AHU-10	EXISTING	12 x 12	1/2	400	65	82	1.0	400	0.06	0.73	0.12	180	160	7344	②
8	—	AHU-6		18 x 9	1/2	580	65	80	1.12	518	0.09	0.94	0.16	180	160	9596	②
9	—	AHU-6		42 x 18	1/2	3220	65	80	6.0	538	0.12	5.23	1.60	180	160	52326	②
10	—	AHU-6		18 x 12	1/2	810	65	80	1.5	540	0.10	1.31	0.40	180	160	13122	②

① HWS & HWR FROM EXISTING SYSTEM.
② ALL TEMPERATURE CONTROL VALVES SHALL BE 2 WAY PNEUMATIC MODULATING TYPE (U.O.N. ON WATER FLOW DIAGRAM 1 PSIG MAX. PRESS. DROP.

DAMPER SCHEDULE

SYST. NO	RET. AIR FAN	DAMPER AIR QUANTITY - CFM OSA MIN.	OSA MAX.	RET. AIR MIN.	RET. AIR MAX.	EXHAUST AIR MIN.	EXHAUST AIR MAX.
AHU-3	RF-1	780	4820	0	3540	290	3830
AHU-4	RF-2	390	2590	0	2200	50	2250
AHU-5	RF-3	660	4410	0	3750	0	3750
AHU-6	RF-4	560	4620	0	4060	0	4060
AHU-7	RF-5	600	3520	0	2920	0	2420
AHU-9	RF-8	250	2480	0	2240	0	2240
AHU-10	RF-9	500	4160	0	3660	0	3660
AHU-17	RF-6	2235	4305	0	2070	0	2070
AHU-18	RF-7	2900	5160	0	2260	0	2260

- OSA DAMPERS SIZE TO MATCH LOUVERS (U.O.N.)
- SIZE RETURN AIR & EXHAUST AIR DAMPERS FOR 1000 FPM (GROSS AREA)

MISCELLANEOUS EQUIPMENT SCHEDULE

FIME SCRUBBER S-1 : DUALL INDUSTRIES MODEL FW 300. CEILCOTE OR APPROVED EQUAL, FACTORY ASSEMBLED. VERTICAL COUNTER FLOW, PVC CONSTRUCTED, PACKED TOWER UNIT WITH BUILT IN FAN, SELF CONTAINED RECIRCULATION SYSTEM, FLANGED INLET & OUTLET.
FAN TYPE MH, 13000 CFM AT 12½" ϕ WHEEL, 4" TOTAL S.P, TEFC 5HP MOTOR - 2HP/460V/3ϕ/60HZ EQUIPPED WITH A PLASTISOL COATED WHEEL, BELT DRIVEN.

SCRUBBER SHALL RECIRCULATE 36 GPM THRU SPRAY NOZZLES WITH 5% MAKE UP PROVIDE SELF-CONTAINED 22.9 GAL. RECIRCULATION TANK & RECIRCULATION PUMP WITH ¾ HP TEFC-56, 3600 RPM MOTOR 460 V/3ϕ/60 HZ UNIT OPER. WEIGHT - 759 LBS

TEMPERATURES CONTROL AIR COMPRESSOR TCC-1: : HONEYWELL, JOHNSON SERVICE OR APPROVED EQUAL, DUPLEX TANK MOUNTED AIR COMPRESSOR COMPLETE WITH FACTORY MOUNTED PREWIRED PANEL INCLUDING STARTERS, PRESSURE SWITCHES, ALTERNATORS, DISCONNECTS, ETC., UL. LABELED 2 - ¾ HP, 460 V, 3ϕ, 60 HZ MOTORS, 30 GAL. ON HORIZONTAL ASME TANK

EXISTING HP-2 HEAT PUMP TRANE WCHO 60A: REBALANCE FOR 1000 CFM AT .15" SP.

EXISTING EXH. FAN, EF-23 AEROVENT MODEL 21G12CVB CENTRIFUGAL ROOF EXHAUSTER ¾ HP, 460V, 3ϕ MOTOR, WITH VARIABLE SPEED DRIVE.

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Project No. 9006
M 44 | 0
Sheet No. 114/178 | Revision

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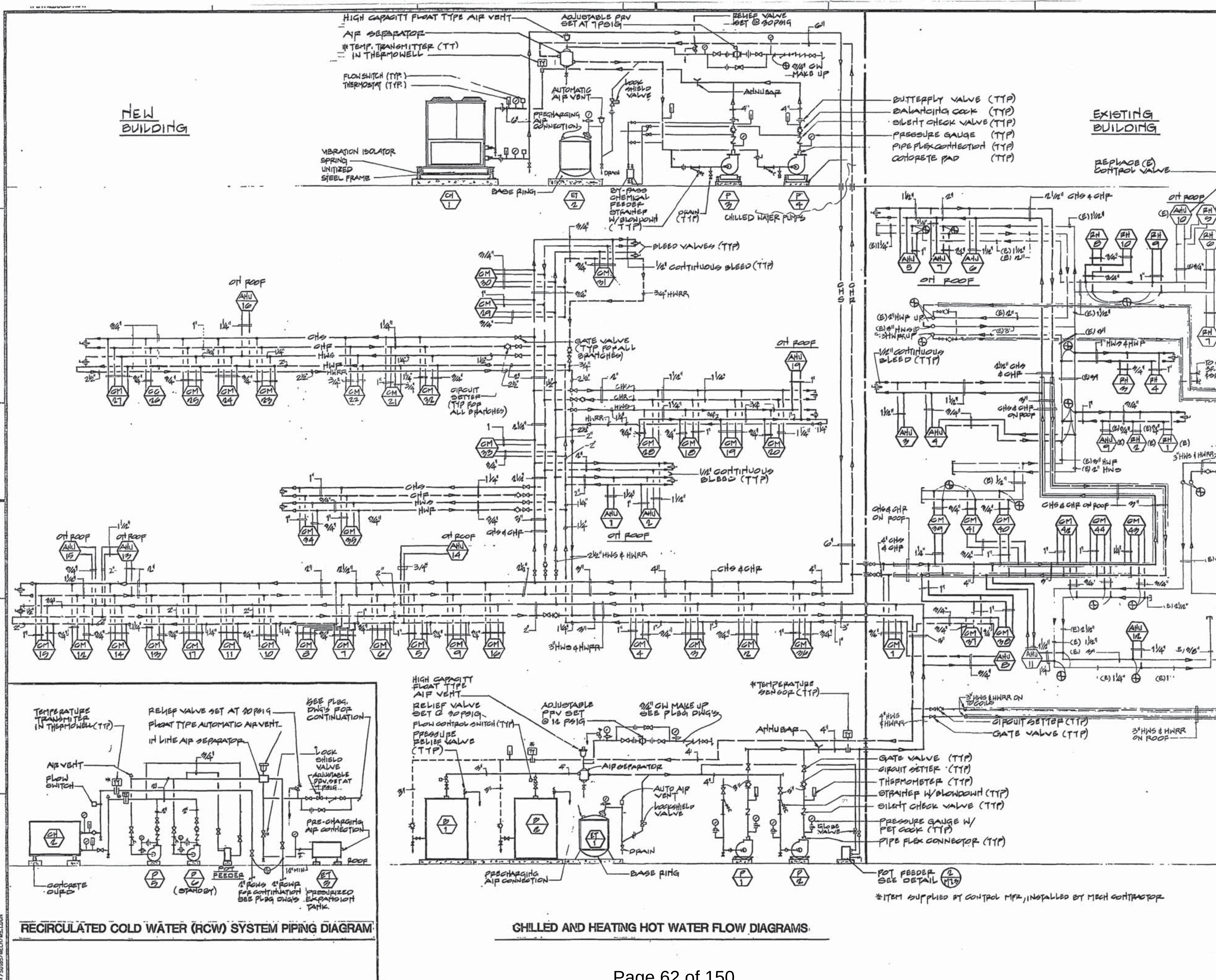
NEW BUILDING
EXISTING BUILDING
HIGH CAPACITY FLOAT TYPE AIR VENT
ADJUSTABLE PRV SET AT 7PSIG
RELIEF VALVE SET @ 30PSIG
AIR SEPARATOR
*TEMP. TRANSMITTER (TT) IN THERMOWELL
FLOW SWITCH (TYP.)
THERMOSTAT (TYP.)
AUTOMATIC AIR VENT
LOCK SHIELD VALVE
PRECHARGING AIR CONNECTION
ANNUBAR
BUTTERFLY VALVE (TYP)
BALANCING COCK (TYP)
SILENT CHECK VALVE (TYP)
PRESSURE GAUGE (TYP)
PIPE FLEX CONNECTION (TYP)
CONCRETE PAD (TYP)
VIBRATION ISOLATOR SPRING
UNITIZED STEEL FRAME
BASE RING
BY-PASS CHEMICAL FEEDER STRAINER W/BLOWDOWN (TYP)
DRAIN (TYP)
CHILLED WATER PUMPS
REPLACE (E) CONTROL VALVE
BLEED VALVES (TYP)
1/2" CONTINUOUS BLEED (TYP)
GATE VALVE (TYP FOR ALL BRANCHES)
CIRCUIT SETTER (TYP FOR ALL BRANCHES)
ON ROOF
CHS
CHR
HWS
HWR
HIGH CAPACITY FLOAT TYPE AIR VENT
RELIEF VALVE SET @ 30PSIG
FLOW CONTROL SWITCH (TYP)
PRESSURE RELIEF VALVE (TYP)
ADJUSTABLE PRV SET @ 12 PSIG
3/4" CW MAKE UP SEE PLBG DWG'S
*TEMPERATURE SENSOR (TYP)
AIR SEPARATOR
AUTO AIR VENT
LOCKSHIELD VALVE
GATE VALVE (TYP)
CIRCUIT SETTER (TYP)
THERMOMETER (TYP)
STRAINER W/BLOWDOWN (TYP)
SILENT CHECK VALVE (TYP)
PRESSURE GAUGE W/ PET COCK (TYP)
PIPE FLEX CONNECTOR (TYP)
PRECHARGING AIR CONNECTION
POT FEEDER SEE DETAIL
*ITEM SUPPLIED BY CONTROL MFR, INSTALLED BY MECH CONTRACTOR
TEMPERATURE TRANSMITTER IN THERMOWELL (TYP)
RELIEF VALVE SET AT 30 PSIG
FLOAT TYPE AUTOMATIC AIR VENT
IN LINE AIR SEPARATOR
SEE PLBG. DWG'S FOR CONTINUATION
AIR VENT
FLOW SWITCH
LOCK SHIELD VALVE
ADJUSTABLE PRV SET AT 7PSIG
PRE-CHARGING AIR CONNECTION
ROOF
CONCRETE CURB
(STANDBY)
POT FEEDER
PRESSURIZED EXPANSION TANK
RECIRCULATED COLD WATER (RCW) SYSTEM PIPING DIAGRAM
CHILLED AND HEATING HOT WATER FLOW DIAGRAMS

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4	1-25-92	ISSUED FOR CONSTRUCTION ADDENDUM 4
	2-29-96	AS BUILT

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Sheet Title

FLOW DIAGRAMS

Project No. 9002

M 5.1 | 0

Sheet No 115/178 Revision

USER: RGA
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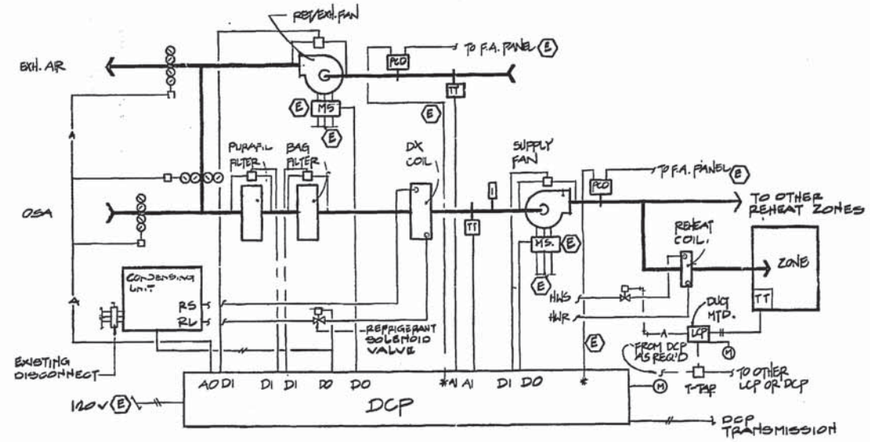
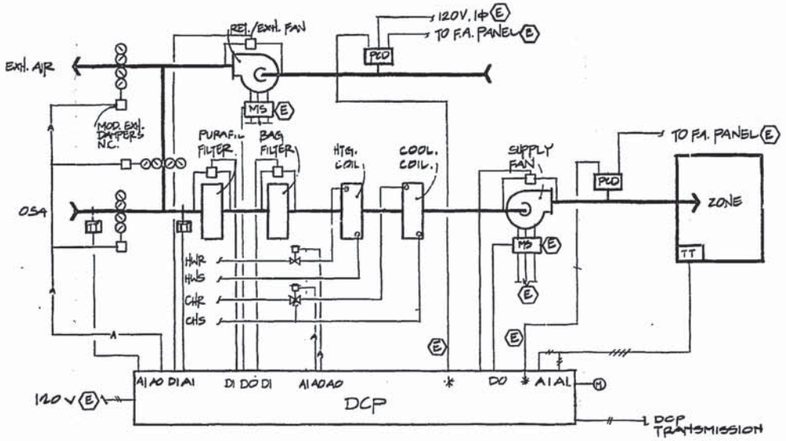


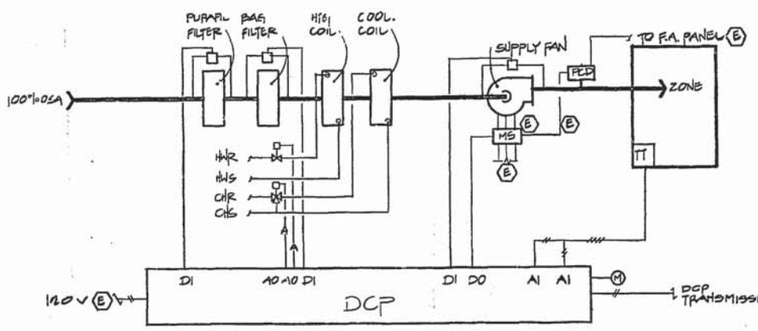
1 M6.1 **AIR FLOW & TEMPERATURE CONTROL DIAGRAM**

NOT TO SCALE — TYP. FOR AHU- 10



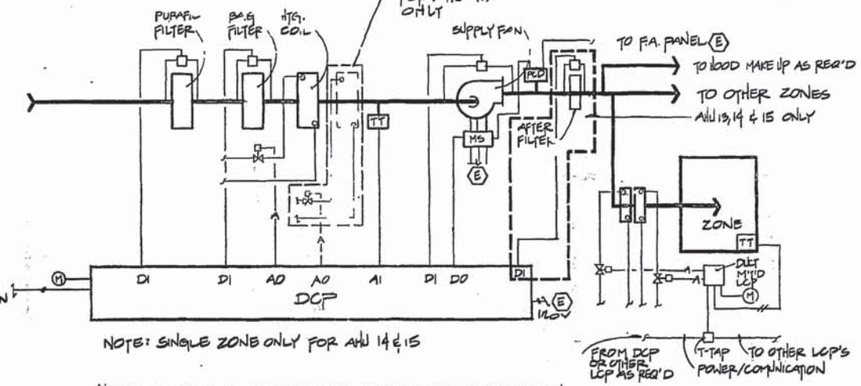
2 M6.1 **AIR FLOW & TEMPERATURE CONTROL DIAGRAM**

NOT TO SCALE — TYP. FOR AHU- 4, 5, 7



3 M6.1 **AIR FLOW & TEMPERATURE CONTROL DIAGRAM**

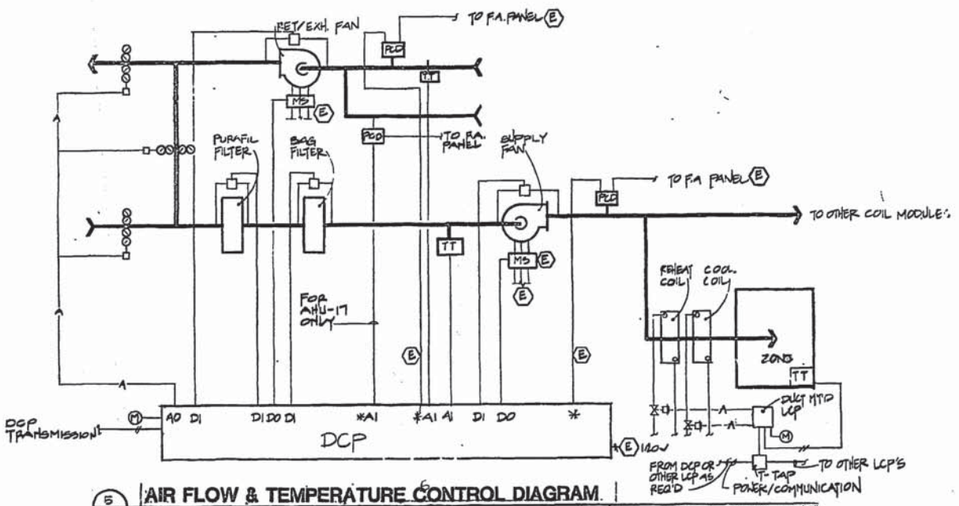
NOT TO SCALE! — TYP. FOR AHU- 2, 11



4 M6.1 **AIR FLOW & TEMPERATURE CONTROL DIAGRAM**

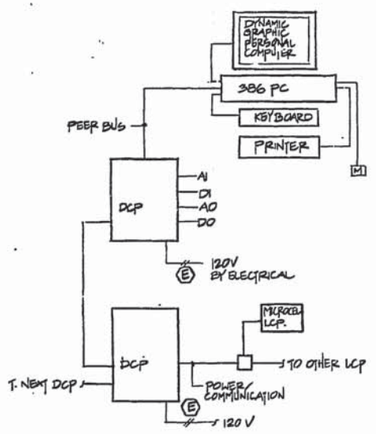
NOT TO SCALE

TYP. FOR AHU-13, 14, 15
AHU-1, 8, 12, 16, 19 SIMILAR EXCEPT NO AFTER FILTER



5 M6.1 **AIR FLOW & TEMPERATURE CONTROL DIAGRAM**

NOT TO SCALE. — TYP. FOR AHU-17,18



6 M6.1 **BMS GRAPHIC CENTRAL ARCHITECTURE FOR CONTROLS**

NOT TO SCALE

(M) CONTROL AIR SUPPLY
(E) UNDER ELECTRICAL WORK, ALL OTHER WIRING UNDER MECH.
(*) SUPPLY FAN SMOKE DETECTOR SHALL SHUT DOWN BOTH SUPPLY & RETURN FANS ON ALARM. RETURN FAN SMOKE DETECTOR SHALL OPEN OA, EA DAMPER AND CLOSE THE RETURN AIR DAMPER.

	CLEAP 405	DIFFERENTIAL PRESSURE AIR FLOW SWITCH
TCV	VSOI WITH MP 953	PNEUMATIC MODULATING CONTROL VALVE
TT	T 7006	DUCT TEMPERATURE SENSOR
TT	T 7515D	ROOM TEMPERATURE SENSOR WITH PUSH BUTTON, LED, AND SETPOINT ADJUSTMENT.
	D6415D	SMOKE CONTROL DAMPER FOR OA, RA, EA DAMPERS
	MP 918	PNEUMATIC DAMPER ACTUATOR
	04 50	DUCT SMOKE DETECTOR, 120V
MS		MOTOR STARTER BY ELECTRICAL SEE M5.1 FOR OTHER CONTROL DEVICES.
	DCP	DIGITAL CONTROL PANEL
	LCP	LOCAL CONTROL PANEL
		CONTROL AIR
	F.A.	FIRE ALARM PANEL

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CONTROL DIAGRAMS

Project No. 9002

M 6.1 — Sheet No. 116/176 — 0 Revision

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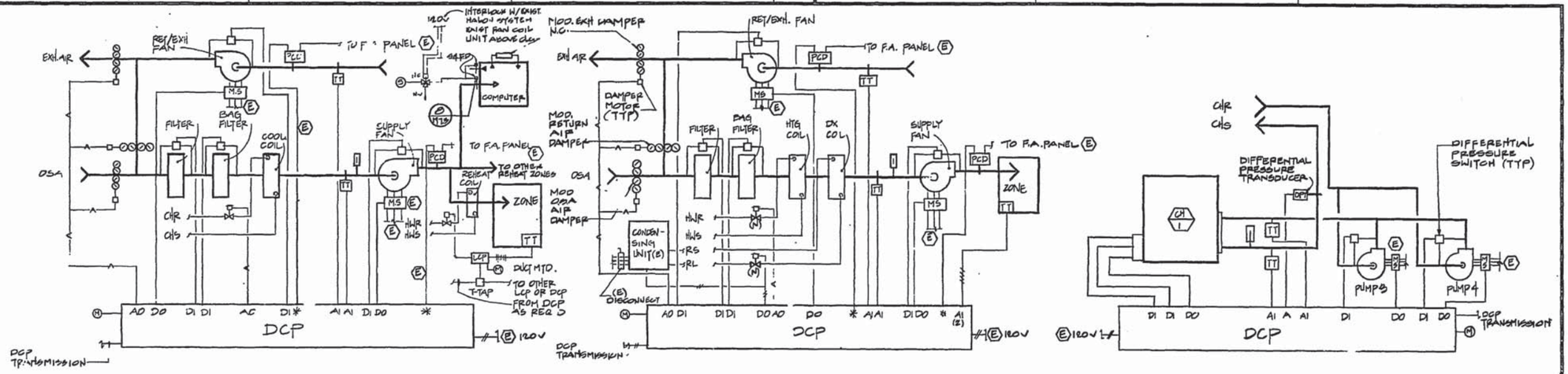
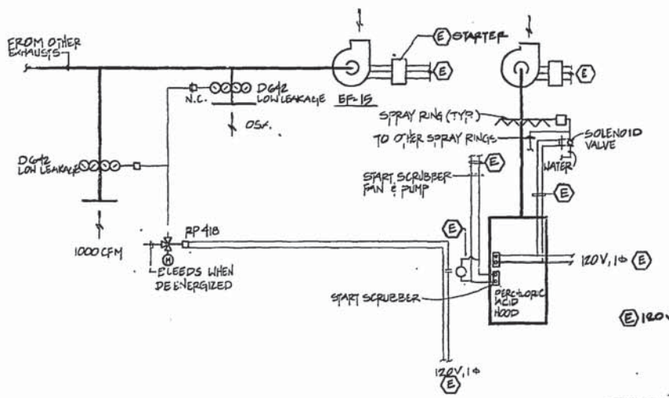


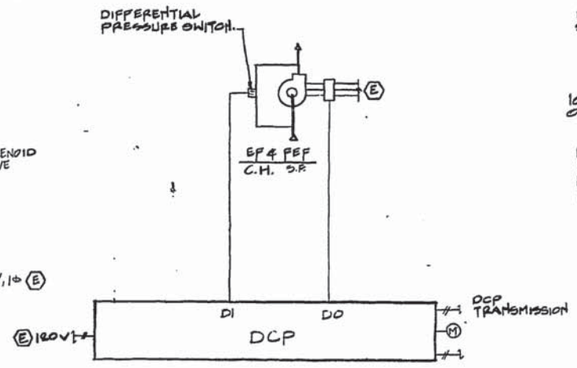
1 M6.2 **AIRFLOW & TEMPERATURE CONTROL DIAGRAM**
TYP. FOR AHU- 3, 6

2 M6.2 **AIRFLOW & TEMPERATURE CONTROL DIAGRAM**
TYP. FOR AHU- 9

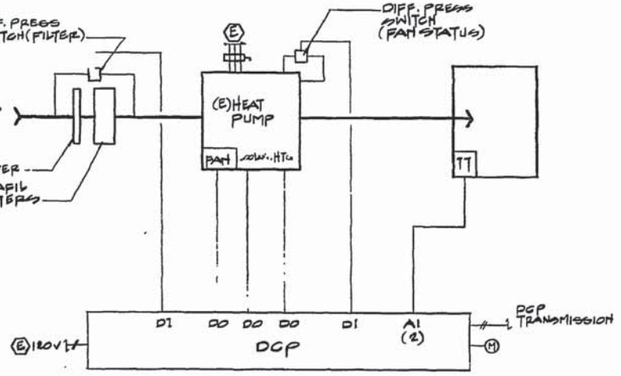
4 M6.2 **CHILLED WATER TEMPERATURE CONTROL DIAGRAM**
FOR CH-1 SIMILAR FOR CH-2



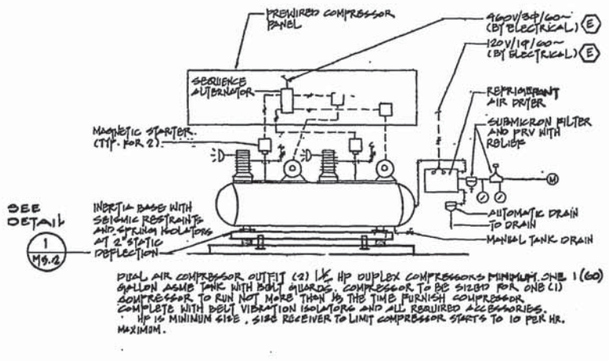
4 M6.2 **DAMPER CONTROL FOR EF-15 SYSTEM**



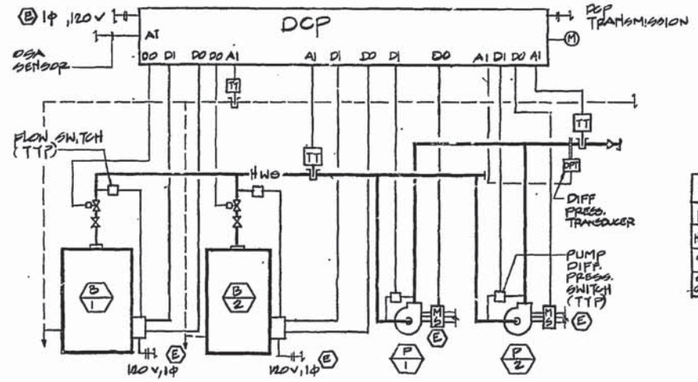
5 M6.2 **EXHAUST FAN CONTROL DIAGRAM**
STATUS ONLY FOR FEF AND C.H. FANS AND EXISTING SF-1 SF-2 & SF-4



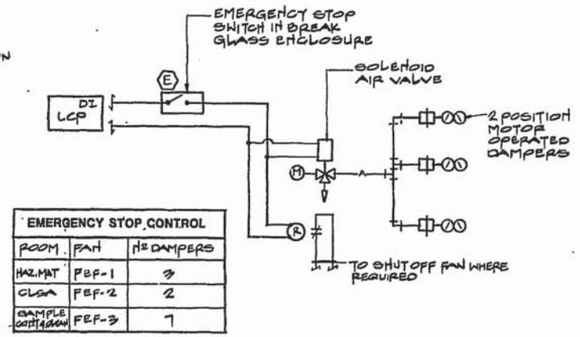
6 M6.2 **AIR FLOW AND TEMPERATURE CONTROL DIAGRAM**
EXIST. HEAT PUMP HP-2



7 M6.2 **TEMPERATURE CONTROL AIR COMPRESSOR**



8 M6.2 **HOT WATER TEMPERATURE CONTROL DIAGRAM**



EMERGENCY STOP CONTROL		
ROOM	FAN	MD DAMPERS
HAZ.MAT	FEF-1	3
CLSA	FEF-2	2
SAMPLE CONTAINER	FEF-3	1

9 M6.2 **EMERGENCY STOP CONTROL**

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No.	Date	Description
1	1-25-96	ISSUED FOR CONSTRUCTION ADDENDUM 4 & 5
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Date 7/29/91

Sheet Title

CONTROL DIAGRAMS

Project No. 90012

M 6.2 | 0

Sheet No. 117/178 | Revision

USER: RGA
DATED: 3-4-96
FILE: /SD185/MECH/M6.2.DGN

OK 9/19/96 BRUCE

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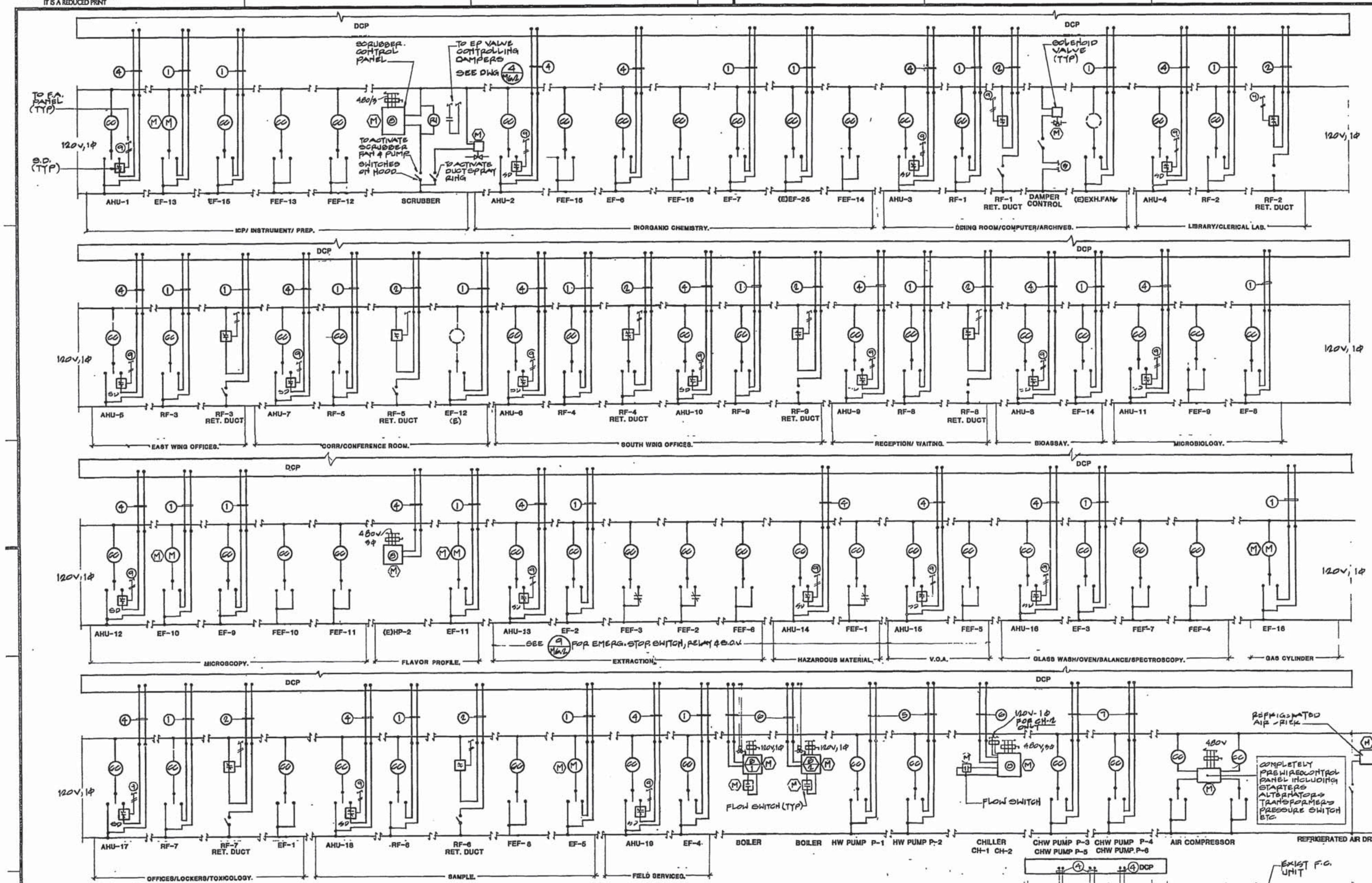

SHEET NOTES

1. INTERLOCK WITH SUPPLY FAN. (M)
2. TO SET DAMPER FOR VENTILATION CYCLE. (M)
3. INTERLOCK WITH HALON SYSTEM.
4. SS – START / STOP. (M)
5. INTERLOCK W/OSA STAT, FLOW SWITCH. (M)
6. INTERLOCK W/ PUMPS. (M)
7. INTERLOCK W/OSA STAT/ & FLOW SWITCH. (M)
8. PREWIRED CONTROL PANEL INCLUDING STARTERS, TRANSFORMERS, CONTROLS ETC. (M)
9. TO FIRE ALARM PANEL
10. ALL WIRE & CONDUIT BETWEEN STARTER OR ELECTRICAL PANEL & DCP SHALL BE INSTALLED UNDER MECHANICAL WORK

S.O.V SOLENOID AIR VALVE
— ~~ALL WIRING~~ INCLUDING CONDUIT BETWEEN DCP & CONTROLLING POINTS TO BE PROVIDED UNDER MECH. WORK.

(M) MOTOR SINGLE PHASE
PB PUSH BUTTON
SD SMOKE DETECTOR, FURNISHED AND WIRED UNDER ELECTRICAL WORK. INSTALL DUCT UNDER MECHANICAL WORK.
(cc) DENOTES STARTER W/CONTROL TRANSFORMER FURNISHED & INSTALLED UNDER ELECTRICAL WORK.
(M) ITEM PROVIDED & INSTALLED UNDER MECHANICAL WORK, U.O.N, ITEMS SUCH AS H-O-A SWITCHES, PUSH BUTTON RELAYS, DISCONNECTS, ETC. CONDUITS & WIRING FROM THIS DEVICES TO MOTORS FURNISHED & INSTALLED UNDER ELECTRICAL WORK.
FOR EMERGENCY STOP SWITCHES IN HAZARDOUS MATERIALS, CLEAN & SAMPLE CON. & CLEAN & EXTRACTION ROOMS.

NOTE: ALL WIRING & CONDUIT BETWEEN MCC & DCP TO BE PROVIDED & INSTALLED UNDER TEMPERATURE CONTROL WORK.

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EAST BAY MUNICIPAL UTILITY DISTRICT Oakland, CA

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EBMUD PROJECT MGR. R.P.E. NO. C 31566
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ELECTRIC INTERLOCK DIAGRAM

Project No. 9002

M6.3 | 0
Sheet No. 118/118 Revision

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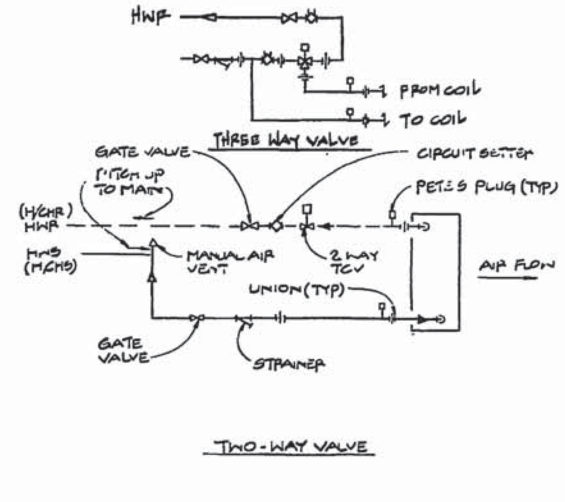
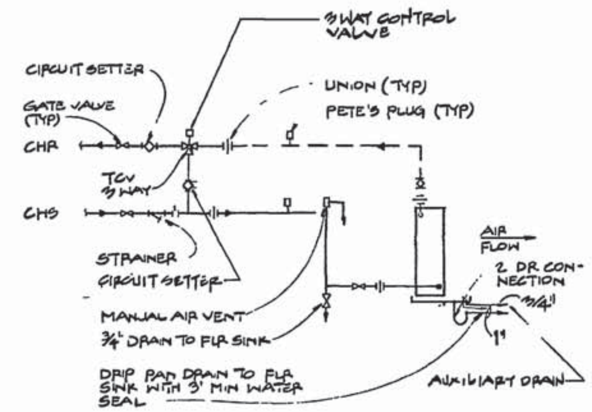
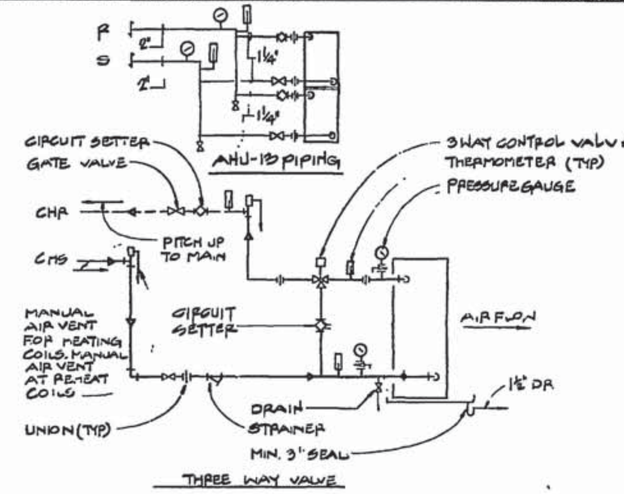


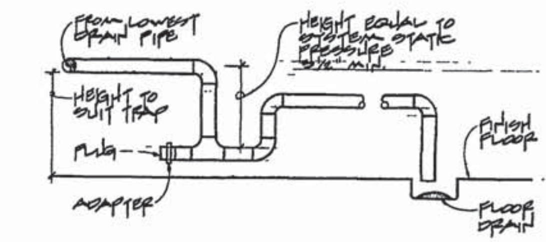
1 / M7.1 **REHEAT COIL PIPING DIAGRAM**
(TYPICAL FOR FAN COIL UNITS- H/CHS & H/CHR)



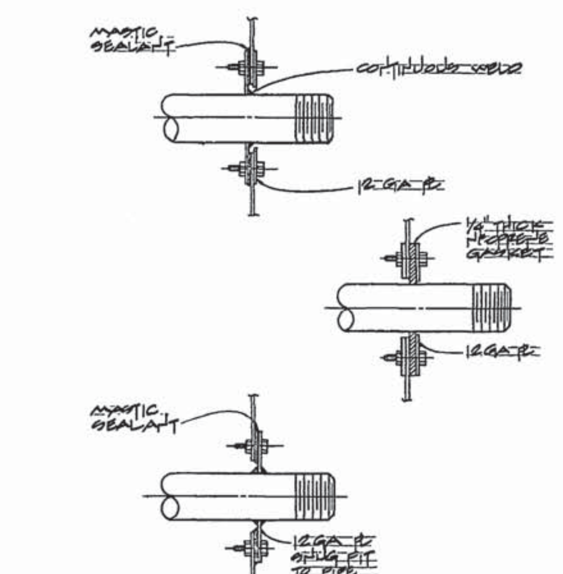
2 / M7.1 **CHILLED WATER COIL PIPING DIAGRAM**
AT COIL MODULES



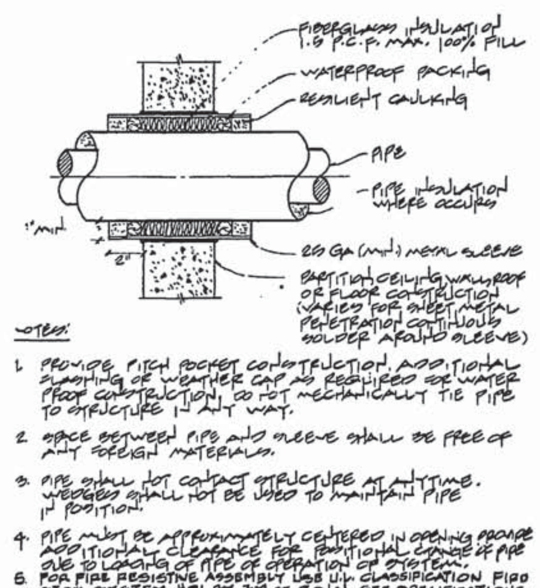
3 / M7.1 **COOLING COIL PIPING DIAGRAM**
AT AHU UNITS



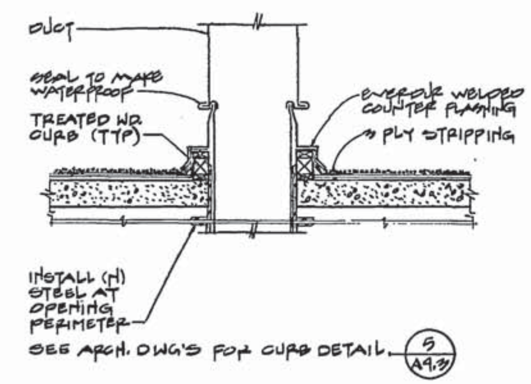
4 / M7.1 **COOLING COIL TRAP DETAIL**



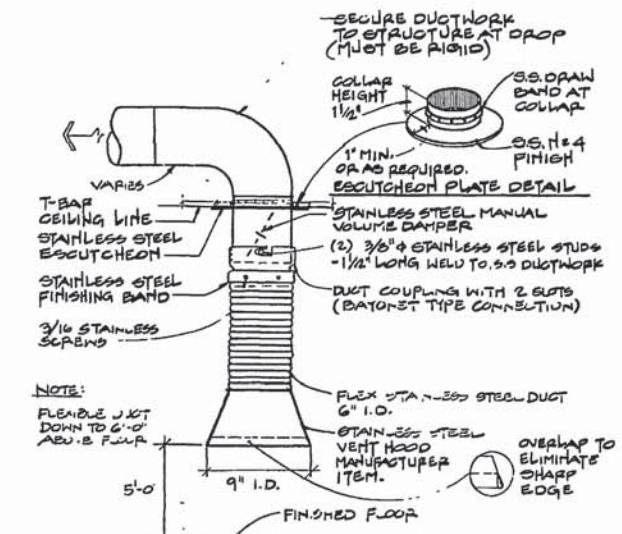
5 / M7.1 **PIPE PENETRATION OF CASINGS DETAIL**



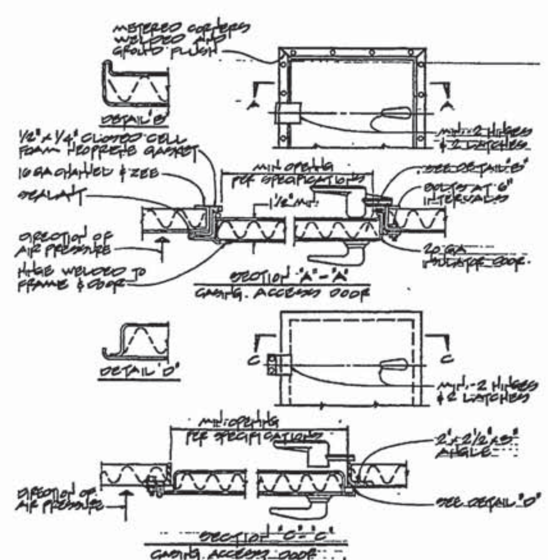
6 / M7.1 **ISOLATED PIPE PENETRATION DETAIL**



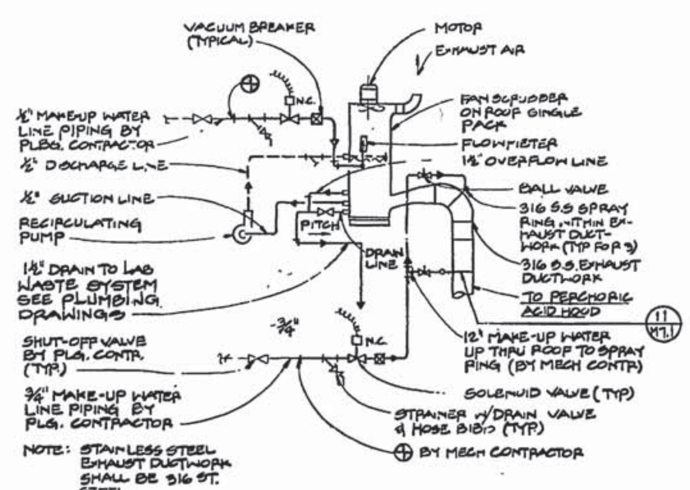
7 / M7.1 **DUCT THRU ROOF DETAIL**



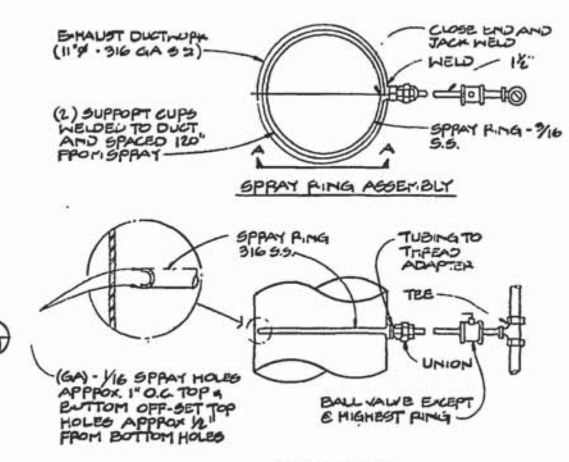
8 / M7.1 **ELEPHANT TRUNK DETAIL**



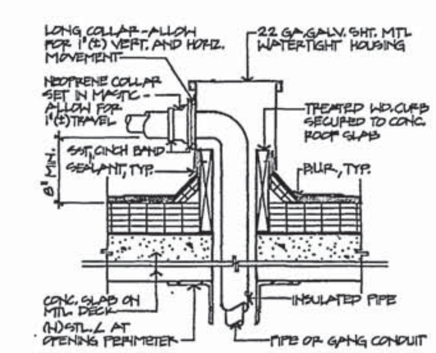
9 / M7.1 **CASING ACCESS DOOR DETAIL**



10 / M7.1 **PERCHLORIC ACID FUME SCRUBBER PIPING SCHEMATIC DETAIL**



11 / M7.1 **SPRAY RING DETAIL**



12 / M7.1 **PIPE ROOF PENETRATION**

NOT TO SCALE

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DETAILS

Project No. 9002
M 7.1 | 0
Sheet No. 110/178 Revision

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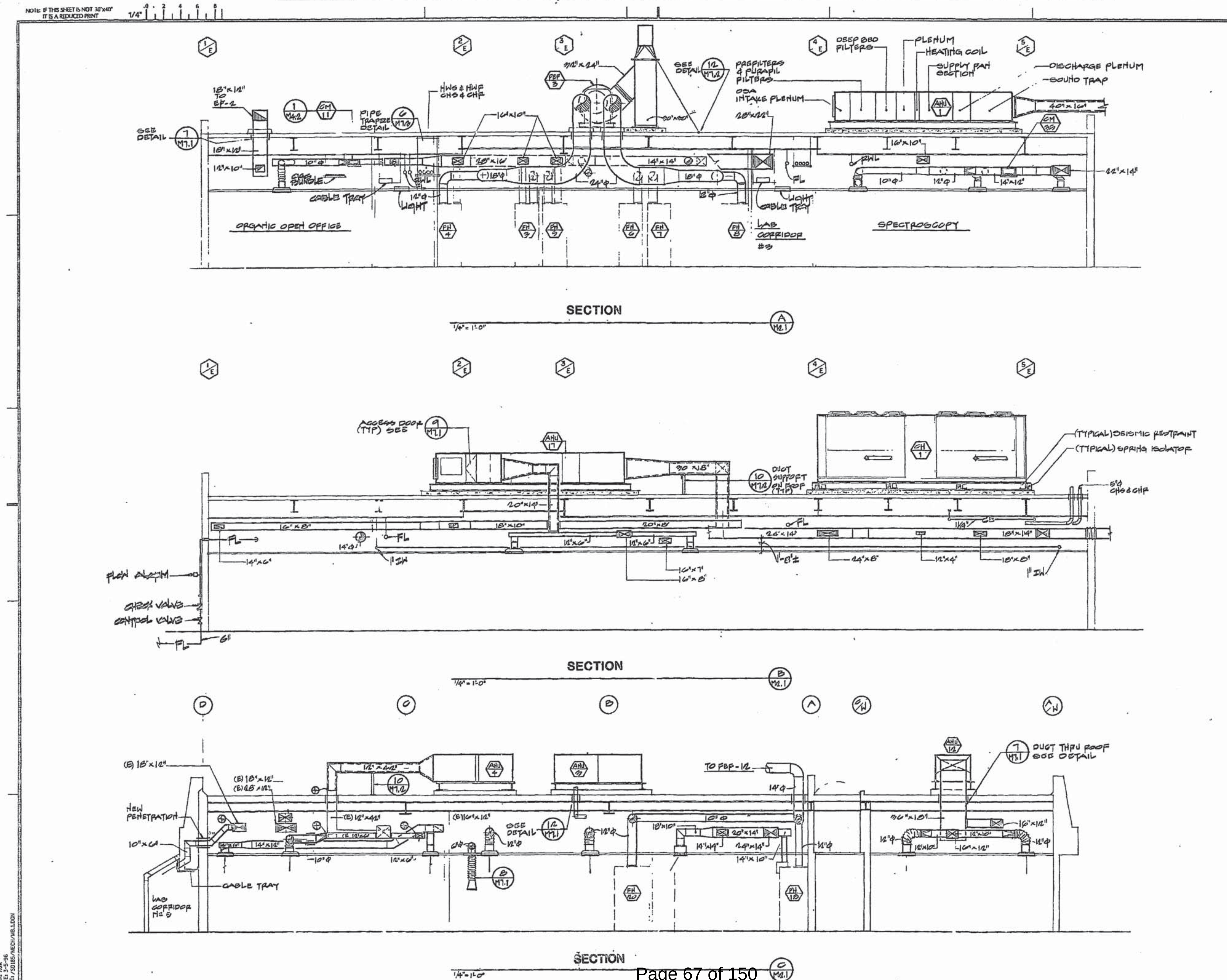
DATE: 3-4-96

GK 9/19/96 Baks



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BUILDING SECTIONS

1/4" = 1'-0"

Project No. 9002

M 8.1

Revision 0

Sheet No. 122/178

LEGEND

AHU =	AIR HANDLING UNIT
CM =	COIL MODULE
RH =	REHEAT COIL
RF =	RECIRC. FAN
EF =	EXHAUST FAN
FEF =	FUME EXHAUST FAN
CH =	CANOPY HOOD
FH =	FUME HOOD

AHU SCHEDULE

TAG	MANUFACTURER MODEL #	CFM	REMARKS
AHU-1	PACE A-15 B1	5400	
AHU-2	PACE A-16 B1	6300	
AHU-3	PACE A-15 B1	4320	
AHU-4	PACE A-12 B1	2600	
AHU-5	PACE A-15 B1	4410	REFURBISHED
AHU-6	PACE A-15 B1	4620	REFURBISHED
AHU-7	PACE A-13 B1	3500	REFURBISHED
AHU-8	PACE A-12 B1-SWS1	1480	
AHU-9	TRANE	2480	
AHU-10	TRANE	4160	
AHU-11	PACE A-13 B1	3870	50% REFURBISHED
AHU-12	PACE A-15 B1	5210	50% REFURBISHED
AHU-13	PACE A-24 AF	14200	
AHU-14	PACE A-12 B1-N	1445	
AHU-15	PACE A-12 B1-SWS1	1505	
AHU-16	PACE A-16 B1	6220	REFURBISHED
AHU-17	PACE A-15 B1	4445	
AHU-18	PACE A-16 B1	5230	REFURBISHED
AHU-19	PACE A-12 B1	2875	REFURBISHED

PUMP SCHEDULE

TAG	SERVICE	GPM	HP
3	CHILL WATER	160	7.5
4	CHILL WATER	160	7.5
5	EQUIP COOLING WATER	27	2
6	EQUIP COOLING WATER	27	2

PRE CHARGED EXPANSION TANK SCHEDULE

TAG	SERVICE	GAL
ET-2	CHILL WATER	33.6
ET-3	COOLING WATER	10.9

CHILLER SCHEDULE

TAG	CAPACITY (TONS)
1	200
2	11

FAN SCHEDULE

TAG	CFM
RF-1	3910
RF-2	2590
RF-3	3750
RF-4	4060
RF-5	2920
RF-6	2830
RF-7	2100
RF-8	2240
RF-9	3660
EF-1	2150
EF-2	1180
EF-3	4300
EF-4	2750
EF-5	300
EF-6	2000
EF-7	2000
EF-8	2820
EF-9	2000
EF-10	750
EF-11	1050
EF-13	600
EF-14	1300
EF-15	2550
EF-16	1000

FUME HOOD EXHAUST FAN SCHEDULE

TAG	CFM
FEF-1	1250
FEF-2	1250
FEF-3	8420
FEF-4	8420
FEF-5	8420
FEF-6	8420
FEF-7	8420
FEF-8	8420
FEF-9	760
FEF-10	1250
FEF-11	2960
FEF-12	2960
FEF-13	1710
FEF-14	1000
FEF-15	760
FEF-16	1000
FEF-17	1250
FEF-18	1760
FEF-19	1760
FEF-20	1760
FEF-21	1000
FEF-22	950
FEF-23	1250
FEF-24	2500

MISC. EQUIP

TAG	REMARKS
COLD ROOM CONDENSOR	COOLS WALK IN FREEZER
CONDENSING UNIT 1	SERVES MICROSCOPY ROOM
CONDENSING UNIT 2	SERVES AHU 10
UN-TAGGED MINI SPLIT	SERVES AB/LAB SERVER ROOM
UN-TAGGED MINI SPLIT	SERVES NEW DCS ROOM
HEAT PUMP 2	SERVES PREPERATION ROOM

ROOM SCHEDULE

ROOM NO.	ROOM NAME	AHU	CM	RH	RF	EF	FEF	FH	CH
100	FIELD SERVICES	19	20	-	-	4	-	-	-
100a	MEN'S LOCKER/RESTROOM	19	19	-	-	4	-	-	-
100b	WOMEN'S LOCKER/RESTROOM	19	19	-	-	4	-	-	-
101	D.I.	19	18	-	-	4	-	-	-
102	SHIPPING/RECEIVING AREA	19	18	-	-	4	-	-	-
103	SAMPLE NIGHT DROP	18	31	-	-	5	-	-	-
104	STORE ROOM	18	28	-	6	-	-	-	-
105	SAMPLE RECEIVING	18	29	-	6	-	8	14	-
105A	INORG SUPERVISOR	18	30	-	6	-	-	-	-
105B	MICRO ASSISTANT	18	24	-	6	-	-	-	-
106	COLD ROOM	-	-	-	-	-	-	-	-
107	LAB MANAGER	18	27	-	6	-	-	-	-
108	INORG. ASST SUPERVISOR	18	25	-	6	-	-	-	-
109	ELECTRICAL ROOM	18	26	-	-	-	-	-	-
110	INORG. ASST SUPERVISOR	18	25	-	6	-	-	-	-
111	INSTRUMENT REPAIR SHOP	18	23	-	6	-	-	-	-
112	SHARED OFFICE	18	22	-	6	-	-	-	-
200	GAS CYLINDER STORAGE ROOM	-	-	-	-	16	-	-	-
201	GENERAL CHEMISTRY	13	15	-	-	-	6	11	-
202	L.C./M.S. & G.C./M.S.	13	12	-	-	2	6	12	-
203	GLASS WASH	16	32	-	-	3	7	13	2
204	V.O.A.	15	17	-	-	2	5	10	-
205	OVEN ROOM	16	33	-	-	3	-	-	1
205A	BALANCE	16	34	-	-	3	-	-	-
206	ORGANIC OPEN OFFICE	13	11	-	-	2	-	-	-
207	ORGANIC RES. OFFICE	13	10	-	-	2	-	-	-
208	CSAMPLE CON. & CLEAN	13	13	-	-	-	3	3,4,5,6,7,8	-
208A	CLSA	13	9	-	-	-	2	2	-
208B	HAZARDOUS MATERIALS	14	16	-	-	-	1	1	-
209	SPECTROSCOPY	16	35	-	-	3	-	-	7
210	LIQUID INSTRUMENT	16	36	-	-	3	4	9	-
300	SUPERVISOR'S OFFICE	17	8	-	7	-	-	-	-
301	SUPERVISOR'S OFFICE	17	7	-	7	-	-	-	-
302	SUPERVISOR'S OFFICE	17	6	-	7	-	-	-	-
303	SUPERVISOR'S OFFICE	17	7	-	7	-	-	-	-
304	MEN'S RESTROOM	17	5	-	-	1	-	-	-
305	WOMEN'S RESTROOM	17	5	-	-	1	-	-	-
306	TOXICOLOGY	17	4	-	-	1	-	-	-
306A	AQUATIC TOXICOLOGY	17	2	-	7	-	-	-	-
307	SUPERVISOR'S OFFICE	17	3	-	7	-	-	-	-

ROOM SCHEDULE CONT.

ROOM NO.	ROOM NAME	AHU	CM	RH	RF	EF	FEF	FH	CH
308	MICROBIOLOGY SUPERVISOR'S OFFICE	17	2	-	7	-	-	-	-
309	MICROBIOLOGY OPEN OFFICE	17	1	-	7	-	-	-	-
310	MICROBIOLOGY	11	-	-	-	8	9	15	-
311	MEDIA KITCHEN	12	42	-	-	9	-	-	-
312	CLEAN ROOM	12	44	-	-	-	10	16	5
313	MICROSCOPY	12	43	-	-	10	11	17	-
314	E.M. (FLAVOR PROFILE)	HP 2	-	-	-	11	-	-	-
314A	E.M. (FLAVOR PROFILE)	HP 2	-	-	-	11	-	-	-
400	INORG. CHEM. LAB	2	-	-	-	6,7,25	15,16	23,24	3,4
400A	RADIOLOGICAL LAB	2	-	-	-	-	14	22	-
400B	INORG. OPEN OFFICE	4	-	-	2	-	-	-	-
400C	INSTRUMENT LAB	1	40	-	-	15	12	20	-
401	BIOASSAY (ANTE ROOM)	8	37	-	-	14	-	-	-
402	BIOASSAY (MAIN ROOM)	8	38	-	-	14	-	-	-
403	ICP ICP/MS	1	39	-	-	15	13,6	21	-
404	PREPARATION LAB	1	41	-	-	13,15	12	18,19	6
405	CLERICAL LAB	4	-	-	2	-	-	-	-
405A	STORAGE (CLERICAL)	4	-	-	2	-	-	-	-
405B	COPY (CLERICAL)	4	-	-	2	-	-	-	-
406	LIBRARY	4	-	-	2	-	-	-	-
407	ARCHIVES/STORAGE	3	-	1	1	-	-	-	-
408	COMPUTER ROOM	3	-	-	1	-	-	-	-
409	MAIL/FAX	9	-	-	8	-	-	-	-
410	ELECTRICAL ROOM	9	-	-	8	-	-	-	-
411	RECEPTION/WAITING	9	-	-	8	-	-	-	-
411A	STORAGE (AT RECEPTION/WAITING AREA)	9	-	-	-	-	-	-	-
412	LUNCH ROOM	3	-	2,4	1	-	-	-	-
413	CONFERENCE ROOM (COMMON)	3	-	3	1	-	-	-	-
500	CONFERENCE ROOM (EAST OFFICE WING)	7	-	-	5	-	-	-	-
501	OPEN OFFICE (EAST WING)	5	-	-	3	-	-	-	-
501A	FIELD SERVICES SUPERVISOR	5	-	-	3	-	-	-	-
501B	WWT. MANAGER	5	-	-	3	-	-	-	-
502	MEN'S RESTROOM	7	-	-	-	12	-	-	-
503	WOMEN'S RESTROOM	-	-	-	-	12	-	-	-
504	VAULT	-	-	-	-	-	-	-	-
505	JANITOR	-	-	-	-	12	-	-	-
506	LOUNGE	7	-	-	-	-	-	-	-
600	FIELD OFFICES	6,10	-	5,9	4	-	-	-	-
600A	CONFERENCE ROOM (SOUTH OFFICE WING)	6	-	10	9,4	-	-	-	-
600B	MCP SUPERVISOR	6	-	8	9,4	-	-	-	-
600C	SUPV CONSTRUCTION INSPECTION	10	-	7	9	-	-	-	-
600D	PE. WCP	10	-	6	9	-	-	-	-

SYSTEMS OVERVIEW, FEATURES, GENERAL OBSERVATIONS AND RECOMMENDATIONS

Fire Protection Systems Evaluation For Key Areas of SD-1

Prepared for:

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Table of Contents

Executive Summary

The purpose of this report is to present the results of a limited study of the existing fire protection provided for the East Bay Municipal Utility District (EBMUD) Special District-1 (SD-1) Administration Building Lab Computer Room, the Administration Building Penthouse Phone and Communication Room, and the Ops Center Control Room and Computer Room.

The study scope included the identification of the fire protection features observed within the individual spaces; a review of their effectiveness and compliance with relevant Building and Fire Code requirements; and recommendations for alternative methods of protection as necessary and appropriate.

Neither the SD-1 Administration Building nor the Ops Center Building are protected by automatic fire sprinkler systems. The Administration Building Lab Computer Room is currently protected by a Fenwal Halon 1301 total flooding fire suppression system, actuated by a manual releasing station, and signals from cross-zoned photo-electric and ionization smoke detectors. Similarly, both the Ops Center Control Room and Computer Room are also protected by separate, individual Fenwal Halon 1301 total flooding fire suppression systems, each actuated by manual releasing stations, and signals from cross-zoned photo-electric and ionization smoke detectors. Automatic fire suppression is not provided for the Administration Building Penthouse Phone and Communication Room. Automatic smoke detectors, signaling to the Building's fire alarm control unit/system provide protection for this space.

At the time of the construction of these Buildings, automatic fire sprinkler protection was not required by the Code of Record. Automatic fire sprinklers would provide an excellent level of fire protection for these spaces, and preaction fire sprinklers are currently used to protect of several similar purpose and critical areas at the District's Administration Building in Downtown Oakland.

Key findings and recommendations are listed below:

- The District should consider discontinuing the use of the existing Halon 1301 fire suppression systems provided for the Administration Building Lab Computer Room and the Ops Center Control Room and Computer Room for several reasons:
    - Halon is no longer manufactured for use in fire suppression systems;
    - Halon is more suitable for free flaming fires, not smoldering fires which is more likely to occur in the subject spaces based on the observed contents;
    - Halon is most effective for rooms that are relatively air tight (the observed spaces will likely need to be modified to become effectively air tight).

- Emergency power and HVAC shutdown are essential to prevent damage to computer servers, associated electrical equipment during fire events, to maintain the fire suppression agent in the protected space(s), and to prevent the spread of smoke and/or fire in a fire situation. An approved manual and automatic means for electrical power shutdown, and an automatic means of HVAC shutdown/isolation, should be provided for the protected spaces.

- The District should determine which spaces are considered critical to operations and provide protection for those spaces, only.

- The District should consider the installation of preaction fire sprinkler or Vortex® fire suppression systems, actuated by a fire alarm system using smoke detection, for spaces considered critical. This approach provides a higher level of fire protection for these spaces, continued compliance with the CBC and reduces the risk of water damage resulting from accidental suppression system discharge.

A. Introduction

This report presents the results of a limited study of the fire protection features provided for various spaces within the Administration Building and the Ops Center at the East Bay Municipal Utility District (EBMUD) Special District-1 (SD-1), located at 2020 Wake Avenue in Oakland, California. Specifically the Administration Building Lab Computer Room, the Administration Building Penthouse Phone and Communication Room, and the Ops Center Control Room and Computer Room.

HYT Corporation performed a brief site visit on May 22nd, 2014 for the purposes of making observations regarding the individual spaces, the operations and storage taking place within each of the subject spaces, and for collecting relevant information relating to the fire protection systems provided for the individual spaces. Aiding in the development of this limited study, HYT Corporation met with District staff who were familiar with these subject areas and utilized record drawings provided by EBMUD indicating several of the various fire protection features provided for these spaces.

The primary focus of the Study is the identification of the fire protection features observed within the individual spaces, their effectiveness, compliance with relevant Building and Fire Code requirements, and recommendations for protection as necessary and appropriate. In addition, observations which may not necessarily have Code compliance implications, but which may constitute "good engineering practice," were considered and recommendations made as appropriate.

As the study is limited to the items identified above, this report does not provide a complete listing of all possible Code requirements or recommended best practices.

B. Relevant Codes and Standards

This information provided in this report was developed using consensus codes and standards, such as those promulgated by the National Fire Protection Association (NFPA); and model Codes, such as the International Building Code (as amended and adopted by the state of California). Specifically, the following codes and standards were utilized in the assessment of the facilities:

- Title 24 of the California Code of Regulations, Part 2, 2013 California Building Code (CBC),
- Title 24 of the California Code of Regulations, Part 9, 2013 California Fire Code (CFC),
- NFPA 13 Standard for the Installation of Sprinkler Systems, as amended and adopted by the State of California CBC and CFC,
- NFPA 72 National Fire Alarm and Signaling Code, as amended and adopted by the State of California CBC and CFC,
- NFPA 750 Water Mist Fire Protection Systems, as amended and adopted by the State of California CBC and CFC,

- NFPA 2001 Clean Agent Systems, as amended and adopted by the State of California CBC and CFC,
- NFPA 25 Water- Based Fire Suppression Systems (California Edition),
- NFPA 75 Standard for the Protection of Information Technology Equipment, representing a standard of recommended and/or good practice (i.e. not adopted by the State of California.

C. General Components of a Fire Protection System

Fire protection systems are typically installed for protection of a building or a specific space for a variety of reasons, the primary of which is compliance to the adopted codes and standards applicable to the jurisdiction in which the protected premises is located. Other considerations for the installation of a fire protection system include mitigation of specific hazards (such as flammable liquids), limitation or reduction of property loss exposure, limitation or reduction of data loss exposure, and protection of sensitive equipment. Of course, the installation of a properly designed and installed fire protection system also enhances the life safety features for the occupants of the building or space.

A fire protection system can consist of a fire detection and/or fire alarm system, a fire suppression system, or a system comprised of a fire detection system for operation of a fire suppression system (such as the Halon 1301 fire suppression systems provided for protection of designated spaces at SD-1). Often, fire protection systems also interface with building systems, such as HVAC fan units, interruption of power sources, operation of dampers, operation of door closures, etc. These ancillary functions are typically present to prevent the fire suppressing agent from causing damage to sensitive equipment, to maintain a concentration of fire suppressing agent in a space, and to prevent the spread of smoke and/or fire in a fire situation.

A brief discussion of common and typical fire protection system components follows.

C1. Fire Detection and Alarm Systems

The design, installation, operation, maintenance, and testing of fire detection and alarm systems is governed by NFPA 72 National Fire Alarm and Signaling Code, as amended and adopted by the State of California CBC and CFC.

The two basic types of fire alarm systems are conventional systems and multiplexed/addressable systems. The difference between these two types of system is their intelligence. A conventional system does not use a microprocessor, so it does not provide alarm address specific information. The alarm initiating devices are “zoned” by circuit, limiting their ability to specifically identify the location of an alarm condition to the size of the zone circuit on which the device in alarm is located. As there is no programming involved, alarm functions (such as operating a Halon 1301 system) and ancillary functions (such as closing dampers) is typically accomplished using switch settings and relays.

A multiplexed/addressable fire alarm system uses a microprocessor, programmed to perform a variety of functions such as operation of fire suppression systems, control of building equipment, etc. Each of the alarm initiating devices is located on a signaling line circuit (SLC), rather than a “zone,” Regardless of the type of system considered, a fire alarm system generally consists of the following components or features:

a) Fire Alarm Control Unit

The fire alarm control unit is the heart and brain of the fire alarm system. It typically contains the power supply necessary for operation of the fire detection devices and the occupant notification appliances. Depending upon the type of system (conventional or addressable), the control receives alarm initiating signals from the various fire detection devices on the system, monitors fire suppression systems, and performs other ancillary functions as designated by the designer. The fire alarm control supervises itself and the circuits associated with the fire alarm system so that ground faults, open circuits, missing devices and appliances, loss of power, microprocessor faults, etc. are alarmed at the control unit. In most cases, the fire alarm control unit also signals alarm, trouble and supervisory signals to a remote monitoring location to cause for fire department response (on alarm conditions) or for maintenance or servicing (trouble and supervisory signals). Fire alarm control units are Listed/Approved for specific applications by Underwriters' Laboratories and are also listed by the California State Fire Marshal's Office in the CSFM Building Equipment Listing.

b) Alarm Initiating Devices

Alarm initiating devices are the eyes and ears of the fire alarm system. They typically consist of manual fire alarm pull stations, heat detectors, smoke detectors, fire sprinkler waterflow switches, and fire suppression system actuation indication (such as pressure switches). Alarm initiating devices may also include valve positions supervisory switches (such as those on fire sprinkler control valves) and ancillary equipment such as gas cabinet detectors, carbon monoxide detectors, etc. On a conventional system, the types of devices and their locations are typically provided on a zone basis (i.e. one circuit for manual fire alarm pull stations, one circuit for elevator smoke detectors, one circuit for valve supervisory switches, etc.) as different types of alarm conditions may necessitate different responses or actions. In an addressable system, the various types of alarm initiating devices may be located on the same SLC as the control unit maintains programming to cause for the different responses to different types of alarm signals. Alarm initiating devices are Listed/Approved for specific applications, and for specific fire alarm control units, by Underwriters' Laboratories and are also listed by the California State Fire Marshal's Office in the CSFM Building Equipment Listing.

c) Occupant Notification Appliances

Occupant notification appliances provide the warning mechanism of a possible fire condition. They are the mouth of the fire alarm system. Appliances typically consist of audible appliances, visual appliances, and/or combination audible/visual appliances. Audible alarms may consist of horns, speakers (for voice alarm systems-such as required for high-rise buildings), bells or chimes. Bells and chimes are typically only permitted in a limited number of Occupancies or circumstances. In California, audible alarms must consist of the temporal Code 3 pattern (as designated in the requirements of NFPA 72), repeated until the alarm signal is silenced at the control unit or until the alarm condition has cleared at the control unit and the control unit has been reset. In voice alarm systems, the temporal Code 3 pattern is repeated multiple times, followed by a prerecorded voice message. Audible fire alarm warning is required to be a minimum of 15dbA above the ambient sound conditions in the space. Audible alarm requirements for residential occupancies and sleeping areas (i.e. hotel rooms) are different, but not relevant to the conditions at SD-1. Visual alarms consist of strobes, located behind a clear

lens. NFPA 72 contains specific requirements for the placement of visual occupant notification appliances to provide coverage of the specific space. In general, strobes are required in public accessible areas. NFPA 72 also requires that strobes within spaces be synchronized to prevent epileptic seizures of photo sensitive individuals. Occupant notification appliances are Listed/Approved for specific applications, and for specific fire alarm control units, by Underwriters' Laboratories and are also listed by the California State Fire Marshal's Office in the CSFM Building Equipment Listing.

C2. Fire Suppression Systems

The design, installation, operation, maintenance, and testing of fire suppression systems is governed by several different NFPA Standards, depending upon the type of fire suppression system installed. The typical standards applied include NFPA 13 Standard for the Installation of Sprinkler Systems, NFPA 750 Water Mist Fire Protection Systems, NFPA 2001 Clean Agent Systems, and NFPA 25 Water- Based Fire Suppression Systems. In many cases, the State of California has amended various requirements within each of these Standards and adopted them with the State amendments in the CBC and CFC. Additionally, the State of California enforces the requirements of Title 19 for the maintenance and servicing of fire suppression systems (specifically fire sprinkler systems). Title 19 is basically an amended version of NFPA 25 Water- Based Fire Suppression Systems.

While there are a variety of types of fire suppression systems and agents available (i.e. firefighting foams, carbon dioxide, water-spray deluge, etc.), the three primary types of fire suppression systems commonly found are fire sprinkler systems, gaseous fire suppression systems, and water mist fire suppression systems. A fourth type of suppression system, Vortex, is relatively new and utilizes a combination of gaseous agent and water mist. The difference between these various types of system is the agent used to suppress or control a fire. A basic description of these types of fire suppression systems follows:

a) Fire Sprinkler Systems

Fire sprinkler systems are the most common type of fire suppression systems. There are a variety of types of fire sprinkler systems, but their basic components are the same and include an adequate water supply/source, a service connection, backflow prevention (which various from jurisdiction to jurisdiction), control valve(s), fire sprinkler piping, and fire sprinklers. Fire sprinklers are Listed/Approved by various agencies for specific types of installations, areas of coverage, discharge densities, pressure ratings, temperature ratings, response time index, etc.

A wet-pipe fire sprinkler system is the most common type of fire sprinkler system. The fire sprinkler piping is filled by water and remains static until flow is initiated by operation of a fire sprinkler, as a result of sufficient heat at the sprinkler to cause for its operation. The only real alarm initiating interfaces between a fire alarm system and a wet-pipe fire sprinkler system are waterflow switches to signal flow conditions and valve position supervisory switches to signal valve closures.

Preaction fire sprinkler systems contain the same basic components as a wet-pipe fire sprinkler system, but additional equipment and fire alarm system interfaces are necessary. In a preaction fire sprinkler system, the fire sprinkler piping is filled with air, rather than water. Air is used to supervise the integrity of the fire sprinkler piping. As a result, an appropriate air supply must be provided for all preaction fire sprinkler systems, which also results in additional fire alarm system

interfaces to monitor the air pressure on the piping network. Water fills the fire sprinkler piping only when specific conditions are satisfied. Preaction fire sprinkler systems are typically used in spaces where there is a concern for have a source of water continuously present, overhead.

The two most common types of preaction fire sprinkler systems are the single-interlock preaction fire sprinkler system and the double-interlock preaction fire sprinkler system. In a single-interlock system, water fills the fire sprinkler piping only when there is insufficient air pressure in the fire sprinkler piping to maintain the valve closed. Loss of this volume of air is assumed to be as a result of the operation of one or more of the fire sprinklers on the system (i.e. the air escapes the piping network via the orifice of the fire sprinkler). Water is then discharged from the operated fire sprinkler(s). Only one criterion needs to be satisfied for system operation, loss of air in the piping network (assumed to be as a result of the operation of one or more of the fire sprinklers).

In a double-interlock system, two conditions have to be satisfied before water fills the fire sprinkler piping. One of these conditions is the loss of air pressure in the piping network (similar to the single-interlock system). The second condition that must be satisfied to cause for water to enter the piping network is a signal from a fire alarm control unit (Listed/Approved for releasing service). This signal is typically provided by smoke detection in the space protected by the double-interlock fire sprinkler system. Upon detection of smoke (assumed to be prior to sufficient heat at the fire sprinkler to cause for its operation to release air pressure in the piping network) and the loss of air pressure, the preaction fire sprinkler valve is opened to cause for water to fill the piping network and discharge from operated fire sprinklers. Both criteria must be satisfied for system operation. A double-interlock system therefore, requires additional fire alarm interfaces for the smoke detection and releasing of the system valve. The District currently protects critical assets in the District's Administration Building in Downtown Oakland using double interlock preaction fire sprinklers.

b) Clean Agent Fire Suppression Systems

Clean agent fire suppression system use a firefighting agent (gas) that chemically interacts with the combustion process to suppress or control a fire. The Halon 1301 fire suppression system protecting spaces at SD-1 are clean agent systems. There are a variety of clean agent currently Listed/Approved for total flooding fire suppression systems. Clean agent systems are designed to fill a volume (the protected space) to a pre-determined concentration (which varies from agent to agent) and to maintain that concentration for a designated period of time (typically 10-minutes). This application is called "total flooding" as the agent is intended to completely fill the volume of the protected space. Maintaining the concentration for a specified period of time is called "holding time." Clean agent systems require a fire detection system to detect the products of combustion and a fire alarm control unit/releasing unit to monitor/supervise the system and to control the system. Upon the appropriate smoke detection signal from the detector(s), the control unit causes for operation of the clean agent system, typically through the use of a control head on the agent container.

The basic components of a clean agent system are the agent container (typically an ASME vessel as the agent is stored under pressure), a control head to initiate operation upon fire alarm signals, agent distribution piping, and discharge nozzles.

c) Water Mist Fire Suppression Systems

Water mist fire suppression systems typically use a water storage vessel (or a pump), gas/air (or a pressure vessel), and water. Very fine water droplets represent the agent in this type of system. Gas, or a pump, is used to pressurize the water at a discharge nozzle to cause for discharge of microscopic sized water droplets. The design of the discharge nozzle represents one of the key factors for system performance. The design intent is to provide such a fine mist that it is capable of controlling or suppressing the fire without resulting in a large volume of water. Water mist systems are typically approved for use in enclosed spaces as their design is dependent upon the volume of the space being protected. There are a variety of water mist systems (and a variety of design concepts for these types of systems) currently Listed/Approved for fire suppression systems. The Listings/Approvals for these types of system is usually very specific in regard to the hazard and size/volume. Water mist systems are designed to fill a volume (the protected space) and to maintain that concentration for a designated period of time.

Water mist systems require a fire detection system to detect the products of combustion and a fire alarm control unit/releasing unit to monitor/supervise the system and to control the system. Upon the appropriate smoke detection signal from the detector(s), the control unit causes for operation of the water mist system.

d) Vortex Fire Suppression Systems

A Vortex suppression system is a combination of a clean agent fire suppression system and a water mist fire suppression system. The Vortex system utilizes nitrogen and water mist to suppress and control fires within a confined space. The primary operation and components are similar to those described above for both the water mist and clean agent systems. The system consists of a smoke detection system, electrically actuated valves, dry nitrogen piping, dry water piping, and water mist nozzles. Under normal conditions, the fire protection piping is dry (empty of water and nitrogen). The basic system operation uses a smoke detection system to detect products of combustion. Upon smoke alarm, a fire alarm control unit causes for a signal to be sent to the Vortex valves causing them to open and for a very small quantity of water to fill the system piping. Water is mixed with nitrogen at the nozzle to create a nitrogen and fine water mist for fire suppression and control. Unlike the clean agent fire suppression system, Vortex systems do not require a “tight” enclosure.

C3. Related Building Systems

Fire alarm and fire suppression systems typically are required to interact with a variety of building systems, such as HVAC fan units, HVAC dampers, and door closures. In computer space, data centers, or other electronically sensitive areas protected by fire sprinklers, fire alarm signals are typically transmitted to cause for the cessation of power, to prevent damage to equipment caused by water intrusion on energized equipment. Also, in the instances involving computer equipment, the energized electrical source is commonly the source of the fire. Cutting power often results in stopping the fire. These signals are usually generated by smoke detection and/or waterflow switches. When spaces are protected by fire

suppression systems requiring tight enclosures (i.e. clean agent fire suppression systems), means must be provided to ensure that air changes do not take place to cause for the dilution of the agent to a concentration below the design concentration. This results in the required closure of doors and HVAC openings (or the shutdown of the appropriate HVAC unit). Similarly, doors and other openings must be closed (and appropriately sealed) to prevent loss of the agent. These functions are most usually performed by a fire alarm system.

D. Facilities Evaluated, Existing Fire Protection, and Findings

D1. Administration Building Lab Computer Room

The Administration Building Lab Computer room currently is protected by a Halon 1301 fire suppression system and occupies an area of approximately 120 ft2. The spaces house computer servers, shelving, and storage. (See partial plan below).

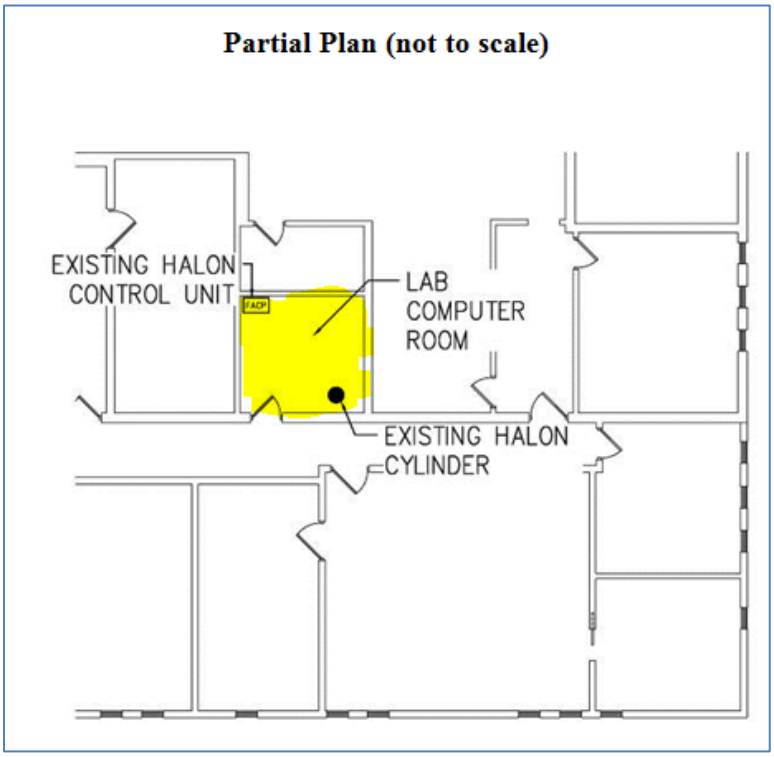


Figure 1. SD1 Administration Building Lab Computer Room

Automatic fire sprinkler protection is not provided for the Building, or for the Administration Building Lab Computer Room. At the time of construction, automatic fire sprinklers were not required.

An automatic, engineered Halon 1301 fire suppression system is provided for the Administration Lab Computer Room. The system was manufactured by Fenwal and consists of a single Halon 1301 storage cylinder (located above the dropped ceiling), control head, system distribution piping and nozzle. The controls for, and actuation of, the system are provided by a Fenwal control unit.

The Fenwal fire alarm control unit (FACU) is provided for the Halon system protecting the space. This FACU serves the Halon system for the space, only, and receives alarm-initiating signals from the following devices:

- Halon manual releasing pull station
- Halon abort station ("dead-man" type)
- Spot-type smoke detectors (a single photoelectric smoke detector and single ionization smoke detector, cross zoned)

Figure 2. Fenwal Control Unit

Figure 3. Detector and Notification Equipment

Figure 4. Halon Cylinder

Figure 5. Halon Manual Release and Abort

The Halon FACU is designed to signal trouble and alarm conditions to the Building's Notifier 4800 FACU, as required by NFPA 72, National Fire Alarm and Signaling Code.

The Fenwal FACU is Listed/Approved for releasing the Fenwal Halon 1301 fire suppression system. Spot-type smoke detectors are provided for protection of the space. The spot-type smoke detectors are cross zoned (i.e. two zones of detection are provided for the space), with reportedly one zone consists of a photoelectric detector and one zone consists of an ionization detector. Both of these zones signal to the

Fenwal FACU. An alarm from a single smoke detection zone or detector causes for a local alarm, signals to the Building's Notifier FACU, and lights the appropriate annunciator at the Fenwal FACU. A cross-zoned signal (i.e. a smoke alarm signal from both detection zones or detectors) causes for a local alarm, signals to the Building's Notifier FACU, lights the appropriate annunciator at the Fenwal FACU, and initiates a 30 second time delay for Halon discharge. If the system abort switch is not operated, the Halon discharges at the termination of the 30 second time delay. The Fenwal FACU initiates immediate (within 5 seconds) Halon discharge upon operation of the Halon system manual releasing pull station. HVAC fan controls or damper controls were not observed.

A variety of occupant alarm notification appliances are provided for the Halon fire suppression system, which signal the pre-discharge and discharge alarms, are supervised by the Fenwal FACU, and are powered from the Fenwal FACU. Warning signs are also posted.

At the time of the site visit, the system appeared to be functioning properly and all devices and appliances appeared to be suitably maintained.

A single Halon cylinder provides the agent for the system protecting this space and is located above the dropped ceiling, within the space protected.

The housekeeping practices observed are not considered appropriate or adequate. The space contains miscellaneous combustible materials including printing/copying supplies, paper, un-used office equipment, etc. The amount of combustible materials observed present an unnecessary fire hazard and is not being maintained in accordance with relevant Standards.

Figure 6. Storage in Computer Room

Figure 7. Storage in Computer Room

Figure 8. Sub-floor Debris and Cabling

The power supply arrangement for the room is confusing and does not appear to be consistent with general good engineering practices for essential facilities. The space originally had a clean power supply unit (located in the Penthouse) to provide the electrical supply and distribution to the computer equipment. This supply was provided with an Emergency Power Off (EPO) switch, which could be used in the event of an emergency. This power supply no longer powers the electrical distribution in the room.

Additional power supply and distribution to the room was also provided with circuits powered by the Building's emergency generator (provided with red outlets in the room). These circuits have since been removed from the electrical distribution for the room.

Figure 9. Emergency Generator Power Circuit (Red outlets)

A third power supply originally provided consisted of an Uninterruptable Power Supply (UPS) system with the power supplies located in the Penthouse. These circuits do not have EPO capability. Lastly, the room is provided with electrical power and distribution from the Building's normal power distribution. Once again, these circuits do not have EPO capability.

Figure 10. Emergency Power Off/Disconnect

Observations made at the time of the site visit indicated that energized electrical equipment sensitive to water intrusion (and assumed to be essential to the District's operations) are present. Manual electrical power disconnect switches were observed, but are no longer functional. In addition to the loss of operations concerns caused by potential power outages (i.e. the existing electrical arrangement provided for the room), emergency power shutdown is essential to prevent damage to the servers and associated electrical equipment during fire events, or given a failure of other building systems resulting in potential water exposure to the energized equipment.

The HVAC arrangement for the room does not provide automatic shutdown or damper closure for the containment of the Halon 1301 agent following discharge. The HVAC system has been modified to provide ventilation via the Building's HVAC system, in addition to its own self-contained HVAC supply, and no automatic shutdown or dampers are provided. The door providing access to the space does not appear to be air tight and penetrations in the walls and ceilings do not appear to be sealed to be air tight. It is necessary to maintain the Halon concentration for a 10 minute time period following discharge for effective suppression. Discontinuing the HVAC supply to a protected space, ensuring all openings and penetrations are sealed is necessary to maintain the Halon concentration for effective suppression.

D2. AB Penthouse Phone and Communication Room

The Administration Building Penthouse Phone and Communication Room currently has no automatic fire suppression protection. The space occupies an area of approximately 280 ft2 and houses communications equipment. (See partial plan below).

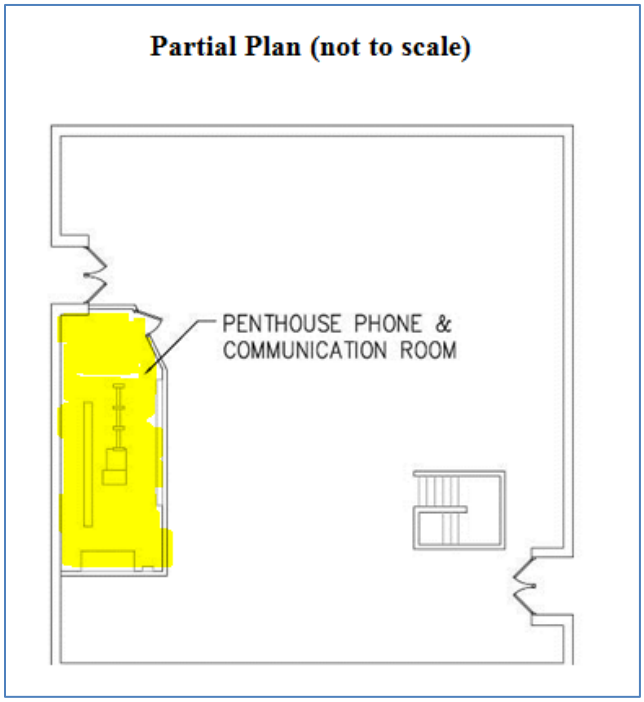


Figure 11. SD1 Admin Penthouse Phone and Communication Room

The Administration Building Penthouse Phone and Communication Room currently has no automatic fire

suppression protection. The space occupies an area of approximately 280 ft2 and houses communications equipment.

Automatic fire sprinkler protection is not provided for the Building, or for the Administration Building Penthouse Phone and Communication Room. At the time of construction, automatic fire sprinklers were not required.

Automatic smoke detection is provided for the space. The smoke detectors communicate alarm and trouble conditions to the Building's Notifier 4800 FACU.

The housekeeping practices observed are not considered adequate or appropriate. The spaces contain miscellaneous combustible materials including printing/copying supplies, paper, un-used office equipment, etc. The amount of combustible materials observed present an unnecessary fire hazard and is not being maintained in accordance with relevant Standards.

Figure 12. Miscellaneous Debris and Storage

D3. Ops Center Control Room and Computer Room

The Ops Center Control Room and Computer Room are currently protected by a Halon 1301 fire suppression systems and occupy areas of approximately 715 ft2 and 150 ft2, respectively. The Control Room houses computer work stations and desk space for the Plant Operations. The Computer Room houses servers and desks. Halon protection is provided for each of the rooms (a separate Halon system is provided for each space). (See partial plan below).

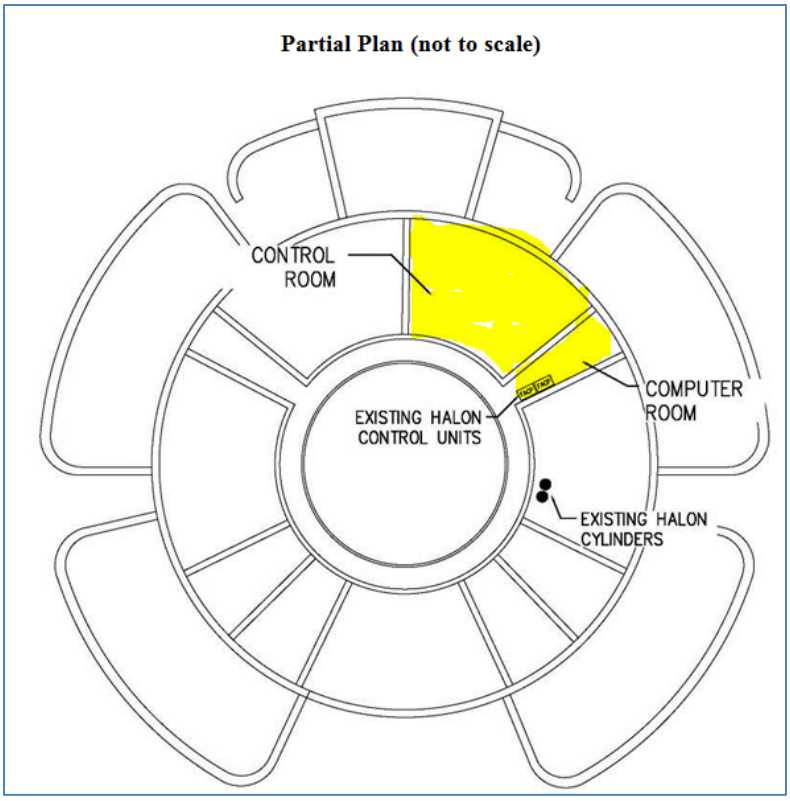


Figure 13. Operations (Ops) Center Control and Communication Room

The Ops Center Control Room and Computer Room are currently protected by a Halon 1301 fire suppression systems and occupy areas of approximately 715 ft2 and 150 ft2, respectively. The Control Room houses computer work stations and desk space for the Plant Operations. The Computer Room houses servers and desks. Halon protection is provided for each of the rooms (a separate Halon system is provided for each space). (See partial plan below).

Automatic fire sprinkler protections not provided for the Building, or for the Ops Center Control Room and Computer Room. At the time of construction, automatic fire sprinklers were not required.

An automatic, engineered Halon 1301 fire suppression system is provided for the Ops Center Control Room, and the Computer Room (separate systems for each space). Each of the systems were manufactured by Fenwal and each system consists of a single Halon 1301 storage cylinder (located in a mechanical room adjacent to the Computer Room), control head, system distribution piping and nozzle. The controls for, and actuation of, each of the systems is provided by a Fenwal control unit (one control unit for each space).

The Fenwal fire alarm control units (FACU) are provided for the Halon system protecting each space. Each FACU serves the Halon system for the space only, and receives alarm-initiating signals from the following devices:

- Halon manual releasing pull station
- Halon abort station (“dead-man” type)

- Spot-type smoke detectors (photoelectric smoke detectors and ionization smoke detectors, cross zoned).

Figure 14. Smoke Detection

Figure 15. Emergency Power Off (typical for both Ops Control and Computer Rooms)

Each of the Fenwal FACU are Listed/Approved for releasing the Fenwal Halon 1301 fire suppression systems. Spot-type smoke detectors are provided for protection of the room. The spot-type smoke detectors are cross zoned (i.e. two zones of detection are provided for the room), with one zone of photoelectric detectors and one zone of ionization detectors. These zones signal to the Fenwal FACU. An alarm from a single smoke detection zone causes for a local alarm and lights the appropriate annunciator at the Fenwal FACU. A cross-zoned signal (i.e. a smoke alarm signal from both detection zones) causes for a local alarm, lights the appropriate annunciator at the Fenwal FACU, and initiates a 30 second time delay for Halon discharge. If the system abort switch is not operated, the Halon discharges at the termination of the 30 second time delay. The Fenwal FACU initiates immediate (within 5 seconds) Halon discharge upon operation of the Halon system manual releasing pull station. HVAC fan controls or damper controls were not observed.

Figure 16. Fenwal Control Units for both Ops Control and Computer Rooms (located in Computer Room)

A variety of occupant alarm notification appliances are provided for the Halon fire suppression system, which signal the pre-discharge and discharge alarms, are supervised by each of the Fenwal FACU, and are powered from each of the Fenwal FACU. Warning signs are also posted.

Figure 17. Notification Appliances

At the time of the site visit, the systems appeared to be functioning properly and all devices and appliances appeared to be suitably maintained (by Global Fire & Safety of Oakland, California).

Two Halon cylinders (a single Halon cylinder for each space) are located in the Mechanical Room adjacent to the Computer Room and provide the agent for each of their respective systems.

Figure 18. Separate Halon Cylinders for Ops Control and Computer Rooms

Figure 19. Halon Manual Release and Abort
(typical for both Ops Control and Computer Rooms)

It was not determined if automatic power shutdown capabilities are provided for the Ops Center Control Room and Computer Room (manual EPO switches were observed for both spaces and were reported to be

operational). The air tight capabilities of the spaces were not verified. The ventilation system should be confirmed to cause for shutdown during Halon discharge. Penetrations and door openings should also be confirmed to be adequately sealed.

E. Fire Protection Systems for Consideration at SD1

The fire protection systems considered for installation to protect the subject spaces at SD1 are discussed in the following paragraphs. Additionally, typical design and estimated construction costs are included in the tables of this section. As with any engineering budget estimate, these estimates reflect a probable construction and installation costs using commercially available resources and list pricing from various manufacturers. This estimate may be used for budgeting purposes, but it may not reflect actual cost figures for the work as contracting conditions, the presence of asbestos or other hazardous materials, or other hidden conditions have not been considered.

In preparing this estimate of probable construction costs, the following resources were considered:

- Means Construction Cost Data
- Marshal & Swift Construction Cost Data
- Fire alarm equipment manufacturer's published price lists
- Bidding cost data from fire alarm system distributors

The Project Drawings were utilized in developing the estimate of probable costs for the installations. Judgment was applied in regard to possible Contractor routing, conduit routing, extent of work to provide raceways in concealed areas, etc.

E1. Fire Detection and Alarm

The existing fire detection provided for the spaces under consideration in this evaluation consist of standard response photoelectric and ionization smoke detectors. Photoelectric principle smoked detectors utilize a photoelectric light source aimed at a light sensitive receiver inside a collection chamber in the detector. Particles of combustion (i.e. smoke) enter the chamber and interrupt the light to cause for the detector to go into alarm. Ionization detectors utilize a small (and safe) radioactive source inside the collection chamber of the detector. Particles of combustion (i.e. smoke) enter the chamber and the radioactive source "ionizes" them to cause for a small current flow to cause for the detector to go into alarm. These detectors are typical to what would normally be found in business, assembly, light manufacturing, and similar occupancies. Typically, the manufacturer of smoke detector used in these types of installations must be Listed/Approved for use with the fire alarm control unit to which it is connected to, powered by, and communicating with. While suitable for most applications, more sensitive detection is sometimes warranted for protection of high value installations, or installations where business or operations interruption is a concern.

In locations where greater smoke detection sensitivity is desired or warranted, high sensitivity air sampling smoke detection (HSSD) systems are typically used. The most prevalent manufactures and types of systems are Fenwal's Analaser and Xxtralis's VESDA. These systems utilize a sample pipe network (which can be of almost any material such as copper, CPVC, steel, conduit, etc.) within the protected space. The sample piping (which is typically no larger than 1-inch in diameter) contains drilled sample ports, spaced at intervals in accordance with NFPA 72 for smoke detector spacing. The sample

piping is routed back to the detector. A small fan in the detector draws air from the protected space(s) via the sample ports and sample piping, back to a very sensitive detector and detection chamber. The detector can be programmed for a variety of sensitivities (subject to the detector's Listings and Approvals). These detectors are capable of detecting very small fires in their very early stages, and can be programmed for a variety of actions, based upon responses to predetermined alarm ranges. Most of these detectors have three or more pre-set alarm ranges which can provide different actions based upon different levels of alarm. An early Alarm warning can be used to cause for investigations, while the highest level of alarm can be used to actuate fire suppression systems. HSSD systems are typically programmed to provide HVAC shut down, emergency power shut down, and similar functions prior to the action of operating a fire suppression system. Unlike the typical smoke detectors described above, HSSD detectors can interface with almost any fire alarm control unit as the detector is provided with relay contacts for alarm, trouble, and supervisory, outputs.

The existing fire alarm control unit arrangement for the protected spaces under consideration in this evaluation are Listed/Approved for releasing fire suppression systems (i.e. Halon 1301 fire suppression systems) and use conventional alarm technology. Additionally, they communicate alarm and trouble conditions to the Building's fire alarm control unit. The existing units are older generation, but may still have some useful life span. Newer control units that may be considered for the spaces would likely be multiplexed, addressable technology, and could perform similar functions as the existing control units (i.e. fire detection, control of suppression systems, alarm signaling and communications with the existing Building fire alarm control unit).

Table 1. Typical Design and Costs for Fire Detection and Alarm Components

System Component	Typical Installation	Estimated Cost	Comments
Spot Type Smoke Detector, Control Module, Monitor Module	Conduit to each device, back box, cabling, etc.	$700/Ea.	Does not include conduit. May be possible to reuse (E) conduit.
HSSD Detector	1" CPVC piping from detector to each hazard.	$3,000/Ea.	Does not include CPVC Piping
CPVC Piping	1" in size	$2.50/Ft.	
CPVC Pipe installation	Above ceiling with capillary drops	$6.00/Ft.	Labor Only
Releasing Fire Alarm Control Unit	Battery back-up, 2-zones minimum releasing capability, multiplexed, addressable.	$3,000/Ea.	
Manual Releases, Abort Switches, Notification Appliances	Conduit to each device, back box, cabling, etc.	$400/Ea.	Does not include conduit. May be possible to reuse (E) conduit.
Door Holder	Conduit to each device, back box, cabling, etc.	$375/Ea.	Does not include conduit. May be possible to reuse (E) conduit.

E2. Fire Suppression Systems

The most common form of fire suppression that could be considered as a replacement for the Halon agent being used in the subject space would normally be fire sprinkler protection, specifically, a preaction fire sprinkler system. Fire sprinkler systems are typically supplied from dedicated service, not from taps into domestic water lines serving the building. As a result, new fire service water connections would be required. Preaction fire sprinklers, in addition to an HSSD system, are currently used at the District's Administrative Building in Downtown Oakland to protect the main "fish bowl" Control, Server/Computer, Records Storage, and Communication rooms.

Table 2. Typical Design and Costs for Sprinkler Suppression Components

System Component	Typical Installation	Estimated Cost	Comments
Building Fire Sprinkler Service Connection	4- to 6-inch service connection	Unknown	Service connection fees subject to local water jurisdiction.
Valve Assembly	Preaction valve for each hazard.	$8,500/Each	Pre-trimmed valve assembly. Provide a single valve for the two Ops Rooms.
Sprinkler Piping	Varying in size from 4" to 1"	$2.30/Ft. – $9.65/Ft/	
Sprinkler Pipe Installation	Above ceiling with drops	$9.00/Ft.	Labor Only

If the District elects not to provide preaction fire sprinkler protection for these critical spaces, a replacement extinguishing agent would need to be considered. The two systems worth consideration are a replacement gaseous fire suppression system and a hybrid gaseous/water mist fire suppression system.

Replacement gaseous fire suppression agents are commercially available. Some of these agents include FM-200® (manufactured by Great Lakes Chemical), FE-13™ (manufactured by DuPont Chemical), and PFC410 (manufactured by 3M Company). For the purposes of this study, and the areas protected by the gaseous systems, carbon dioxide has not been considered due to the life safety concerns the discharge of the agent would present.

Replacement gaseous system installations typically cannot utilize the existing Halon agent containers or nozzles. The system piping also typically has to be reconfigured or replaced. The storage cylinders for these agents also typically occupy a larger foot print (i.e. take up more space). In order for a gaseous fire suppression system to be effective, the enclosure or space into which the agent is discharged must be relatively air tight (i.e. not permit the agent to escape the enclosure or space. The agent must also have a sufficient time (or "holding time") to effectively suppress or extinguish the fire. This holding time is typically 10 minutes.

Gaseous systems may also present moderate hazards to occupants of the space or enclosure into which they are discharged. Gaseous systems typically require or recommend that the spaces be evacuated prior to discharge (similar to the Halon system). This is in part due to undesirable exposure to the gas and the products of decomposition but also the possible physical hazard presented by the high pressure discharge of the gas itself (very sudden and loud noise, reduced visibility, airborne debris, etc.). Lastly, upon discharge of the agent, a new quantity of agent must be purchased and the agent container(s) refilled by factory trained technicians. The cost of these agents is relatively expensive.

A hybrid gaseous/water mist fire suppression system (Vortex suppression system) utilizes nitrogen and water mist to suppress and control fires within a confined space. The system consists of electrically actuated valves, dry nitrogen piping, dry water piping, and water mist nozzles. Under normal conditions, the fire protection piping is dry (empty of water and nitrogen). The basic system operation uses a smoke detection system to detect products of combustion. Upon smoke alarm, a fire alarm control unit causes for a signal to be sent to the Vortex valves causing them to open and for a very small quantity of water to fill the system piping. Water is mixed with nitrogen at the nozzle to create a nitrogen and fine water mist for fire suppression and control. Vortex systems do not require a "tight" enclosure, permitting most existing construction features to remain unchanged. The water supply (a small quantity of water) is typically accomplished with a small, refillable tank and the nitrogen is supplied in standard commercially available nitrogen cylinders. These systems can also be arranged so that one system can provide protection of multiple spaces (i.e. one system, with separate piping, could be provided for protection of both spaces in the Ops Center Building. Refilling the system requires the recharge of water into the storage tank and replacement/refill of the nitrogen cylinders.

Table 3. Typical Design and Costs for Gaseous Suppression System Components

System Component	Typical Installation	Estimated Cost	Comments
Gaseous Suppression Agent	ASME Cylinders	$7,250 (Ops Control Room) $1,300 (Admin. Lab)	Does not include agent containers, valves, actuators, etc.
Gaseous Suppression Containers, valves, actuators, etc.	Rack and frame in a dedicated location	$8,750 (Ops Control Room) $3,200 (Admin. Lab)	Does not include system piping & nozzles (existing piping likely cannot be used).
Gaseous Suppression Piping	Varying in size from 3" to 1"	$2.30/Ft. – $9.65/Ft/	
Gaseous Suppression Pipe installation	Above ceiling with drops	$9.00/Ft.	Labor Only

Table 4. Typical Design and Costs for Vortex Suppression System Components

System Component	Typical Installation	Estimated Cost	Comments
Vortex Suppression System	Water tank, zone control panel, nitrogen cylinders	$46,550 (Ops Control Room) $23,200 (Admin. Lab)	Does not include system piping & nozzles (existing piping likely cannot be used).
Vortex Suppression System Piping	Varying in size from 4" to 1"	$2.30/Ft. – $13.80/Ft/	
Vortex Suppression System Pipe installation	Above ceiling with drops	$9.00/Ft.	Labor Only

F. Discussion & Recommendations

F1. General Discussion (1): Housekeeping

EBMUD has conveyed that the operations taking place in the spaces considered for this assessment are essential to District operations. This indicated level of the facility's operational importance necessitates that the appropriate measures be taken in regard to housekeeping practices, such as the control of combustible and miscellaneous materials in the spaces, as well as general debris accumulations.

The housekeeping practices observed in some of these identified essential spaces are not considered adequate or appropriate. In many instances, the spaces contain miscellaneous combustible materials including printing/copying supplies, paper, un-used office equipment, etc. The amount of combustible materials observed to be present in the Lab Computer Room and the Phone and Communication Room present an unnecessary fire hazard and are not being maintained in accordance with relevant Standards.

GENERAL RECOMMENDATION 1:

NFPA 75, Section 6.2.1 limits the amount of records within the Room to the absolute minimum required for essential and efficient operation. The facility should develop and follow a policy of ensuring that the quantity of combustible (and other non-associated) materials located within the space be limited to only those essential to the daily operations of the operations.

F2. General Discussion (2): Personnel Training

Suppression of fires in their very early, incipient, stages in the areas protected by Halon 1301 is the most effective method to prevent damage to sensitive and essential equipment. An effective method for early suppression of witnessed fires is through the use of an emergency power shutdown (EPO) and the use of portable fire extinguishers.

GENERAL RECOMMENDATION 2:

The District may wish to consider training personnel who normally work in the areas protected by Halon 1301 fire suppression systems in the use of the EPO and in the proper use portable fire extinguishers.

F3. General Discussion (3): Power Supplies

The power supply arrangement for the Administration Building Lab Computer Room is confusing and does not appear to be consistent with general good engineering practices for essential facilities. The space originally had a clean power supply unit (located in the Penthouse) to provide the electrical supply and distribution to the computer equipment. This supply was provided with an Emergency Power Off (EPO) switch, which could be used in the event of an emergency. This power supply no longer powers the electrical distribution in the room.

Additional power supply and distribution to the room was also provided with circuits powered by the Building's emergency generator (provided with red outlets in the room). These circuits have since been removed from the electrical distribution for the room.

A third power supply originally provided for the Lab Computer Room consisted of an Uninterruptable Power Supply (UPS) system with the power supplies located in the Penthouse. These circuits do not have EPO capability. Lastly, the room is provided with electrical power and distribution from the Building's normal power distribution. Once again, these circuits do not have EPO capability.

Observations made at the time of the site visit indicated that energized electrical equipment sensitive to water intrusion (and assumed to be essential to the District's operations) are present in the Administration Lab Computer Room. Manual electrical power disconnect switches were observed, but are no longer functional. In addition to the loss of operations concerns caused by potential power outages (i.e. the existing electrical arrangement provided for the room), emergency power shutdown is essential to prevent damage to the servers and associated electrical equipment during fire events, or given a failure of other building systems resulting in potential water exposure to the energized equipment. It was not determined if automatic power shutdown capabilities are provided for the Ops Center Control Room and Computer Room (manual EPO switches were observed for both spaces and were reported to be operational). Automatic and/or manual power shutdown capabilities are not provided for the Administration Building Penthouse Phone and Communication Room.

GENERAL RECOMMENDATION 3:

NFPA 75, Section 10.4.8 identifies requirements for power disconnect capabilities for these types of facilities. The District should investigate the existing arrangement to identify the features provided. An approved manual and automatic means should be provided to disconnect power to all electronic equipment in these spaces. The control for these disconnecting means should be grouped and identified and shall be readily accessible at the principal exit doors. Recommendations regarding potential automatic operation of these disconnects in concert with

the fire alarm system will be further and separately addressed later in this report.

F4. General Discussion (4): HVAC Control

The HVAC arrangement for the Administration Lab Computer Room is not arranged for automatic shutdown or dampers for the containment of the Halon 1301, other gaseous agents, or Vortex suppression systems agent following discharge. The HVAC system has been modified to provide ventilation via the Building's HVAC system, in addition to its own self-contained HVAC supply, and no automatic shutdown or dampers are provided. The HVAC arrangement for the Ops Center Control Room and Computer Room could not be verified. Discontinuing the HVAC supply to a protected space is necessary to maintain the Halon concentration for a 10 minute time period for effective suppression.

GENERAL RECOMMENDATION 4:

The District should investigate the existing arrangement to identify the features provided. An approved means to disconnect the dedicated HVAC systems serving these spaces and to cause all required fire/smoke dampers to close should be provided.

F5. General Discussion (5): Inadequate Enclosure(s)

The construction of the Administration Building Lab Computer Room does not appear to be adequate for containment of the Halon 1301, other gaseous agents, or Vortex suppression systems agent once discharged into the space. Gaps exist around the entry door to the room and it also appears that there are penetrations in the subfloor space which are not adequately sealed to prevent Halon from escaping. In order to be effective, the Halon concentration must be maintained within the room for a 10 minute period of time.

GENERAL RECOMMENDATION 5:

The configuration for the Ops Control and Computer Room should be confirmed to be air-tight. The existing arrangement should be modified as necessary and appropriate to provide a relatively air-tight enclosure.

F6. Discussion (6): Continued Use of Halon

Halon is no longer manufactured for use in fire suppression systems as it was identified as an ozone depleting material. While recycled quantities of Halon may still be available, they are usually reserved for critical industrial, explosive, or similar occupancies, and typically at a significantly elevated cost. The District does not have reserve capacity to refill/replace the existing Halon cylinders at these installations in the event it was to be discharged.

Halon 1301 suppresses fire by interrupting the chemical chain reaction taking place in the fire. It is best suitable for free flaming fires (i.e. those fires with visible flame, not a smoldering fire). The spaces protected by Halon 1301 appear to have ordinary combustibles, which typically exhibit characteristics more representative of a smoldering fire (i.e. "deep seated" fire) than a free flaming fire. This is

especially true during the incipient stages of a fire, when the Halon 1301 fire suppression systems are designed to actuate.

Fires in energized electrical equipment, representative of all of the protected spaces present a unique challenge. Water intrusion on energized electrical equipment can result in the loss of data or the equipment itself. Current, and recommended, industry practice is to de-energize this type of equipment early in a fire scenario. De-energizing the equipment may result in cessation of the fire itself, and may also reduce the risk of lost data and equipment due to water exposure on energized equipment.

In the event that the District continues to utilize the Halon fire suppression systems providing protection of these subject spaces, the District should consider the following recommendations:

RECOMMENDATIONS:

- The District should consider implementation of the measures identified in General Recommendations 1 through 5, above.

- The District should consider the implementation of the requirements and guidance within NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems to confirm that each of the spaces can achieve the minimum level of air tight encapsulation necessary to contain the agent for a sufficient time frame. The District should conduct room pressure testing for each space in accordance with the guidance within NFPA 2001 and develop the inspection and management of change controls identified within NFPA 2001. This would include an inspection once per year to confirm that modifications to the barriers (i.e. walls, ceilings, etc.) have not taken place to compromise the air tight features of the space.

- No additional modifications would be necessary for the existing Halon 1301 fire suppression systems, fire detection systems, or control systems.

F7. Discussion (7): Fire Protection Systems Modifications

Where fire service water is available on site, automatic fire sprinklers would provide an excellent level of fire protection for these spaces. As with all fire protection system modifications, general buildings retrofit installation may be costly and disruptive to the District's operations and personnel. Below are recommendations to the District for fire protection options to these spaces *outside of the Halon system*:

RECOMMENDATIONS:

- The District should consider implementation of the measures identified in General Recommendations 1 through 5, above for all of the spaces.

- The District should consider the installation of pre action fire sprinkler protection for the critical areas, actuated by a fire alarm system using smoke detection. This approach reduces the risk to water damage resulting from accidental discharge from the fire sprinkler protection. This protection should be considered primarily for the Administration Building Lab Computer Room (1 system) and for the Ops Center Control Room and Communications Room (1 system). Approximate installation costs for the preaction sprinklers are summarized

in Table 5 below.

- If preaction fire sprinkler protection is too costly *(typically because of service connection fees)*, or not desired, the District should consider the installation of a Vortex gaseous/water mist fire suppression system, actuated by a fire alarm system using smoke detection. This approach reduces the risk to water damage resulting from accidental discharge from the fire sprinkler protection. This protection should be considered primarily for the Administration Building Lab Computer Room (1 system) and for the Ops Center Control Room and Communications Room (1 system with 2 zone control valves). Approximate installation costs for the Vortex system are summarized in Table 6 below.

- The District should consider the installation of HSSD Early detection of fires in the spaces protected by preaction fire sprinklers or Vortex fire suppression systems (identified above) and for the protection of the Administration Penthouse Phone and Communications Room. In the event that the District desires not to provide HSSD for areas protected by the fire suppression system, the existing (or new) spot type smoke detectors may also be used.

Table 5. Preaction Sprinkler System Installation Costs for Facilities Evaluated

Preaction System Installations		
Recommendation	**Estimated Cost**	**Comments**
Administration Building Lab Computer Room		
Complete General Recommendations 1 through 5	NA	NA
Install HSSD smoke detection system.	$3,425	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	$3,000	Single zone releasing control unit. Existing control unit may be used, depending upon voltages for the solenoids on the Vortex System.
Install preaction fire sprinkler system.[1]	$17,000	Includes system piping & nozzles. Service connection costs not included.
Administration Building Penthouse Phone & Communications Room		
Complete General Recommendations 1 through 4.	NA	NA
Install HSSD smoke detection system.	$3,425.00	Complete system installation.
Ops Center Control Room		
Complete General Recommendations 1 through 5	NA	NA

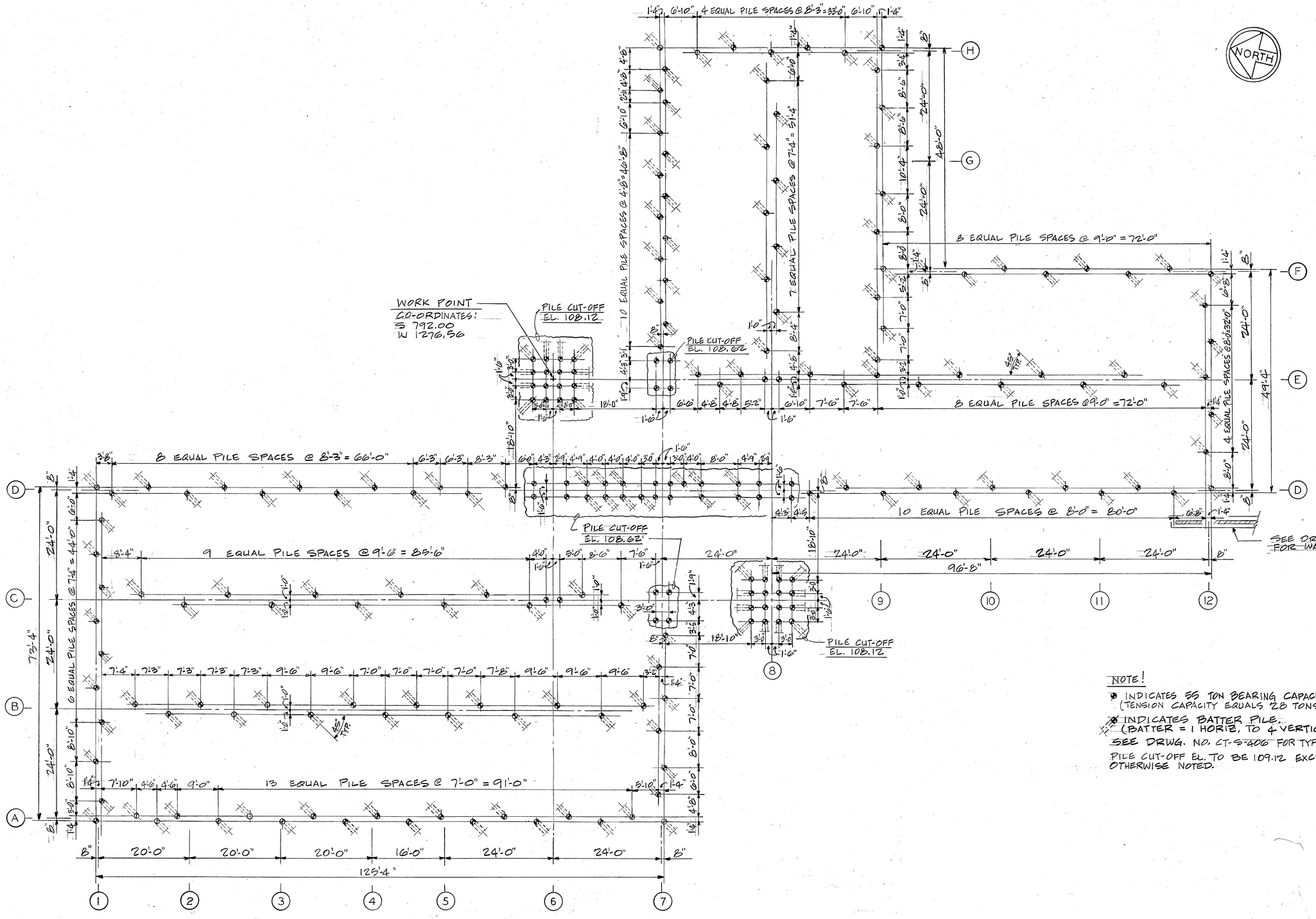
Preaction System Installations		
Recommendation	**Estimated Cost**	**Comments**
Install HSSD smoke detection system.	$3,425.00	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	$3,000	Two zone releasing control unit. Existing control unit may be used, depending upon voltages for the solenoids on the Vortex System.
Install preaction fire sprinkler system.[1]	$17,550	Includes system piping & nozzles. Service connection costs not included.
Ops Center Computer Room		
Complete General Recommendations 1 through 5	NA	NA
Install HSSD smoke detection system.	$3,425	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	NA	Use control unit installed for the Ops Center Control Room
Install preaction fire sprinkler system.[1]	$9,200	A single preaction valve will serve both spaces.

1. Assumes adequate fire water supply is located in proximity of space protected.

Table 6. Vortex System Installation Costs for Facilities Evaluated

Vortex System Installations		
Recommendation	**Estimated Cost**	**Comments**
Administration Building Lab Computer Room		
Complete General Recommendations 1 through 5	NA	NA
Install HSSD smoke detection system.	$3,425	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	$3,000	Single zone releasing control unit. Existing control unit may be used, depending upon voltages for the solenoids on the Vortex System.
Install Vortex fire suppression system.	$ 24,440	Includes system piping & nozzles.

Vortex System Installations		
Recommendation	**Estimated Cost**	**Comments**
Administration Building Penthouse Phone & Communications Room		
Complete General Recommendations 1 through 4. If District elects to install Vortex System in this room, then complete General Recommendation 5 as well.	NA	NA
Install HSSD smoke detection system.	$3,425.00	Complete system installation.
Ops Center Control Room		
Complete General Recommendations 1 through 5	NA	NA
Install HSSD smoke detection system.	$3,425	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	$3,000	Two zone releasing control unit. Existing control unit may be used, depending upon voltages for the solenoids on the Vortex System.
Install Vortex fire suppression system.	$49,450	Includes system piping & nozzles.
Ops Center Computer Room		
Complete General Recommendations 1 through 5	NA	NA
Install HSSD smoke detection system.	$3,425.00	Complete system installation. Existing smoke detectors may be used if the existing control unit remains.
Install new releasing fire alarm control unit	NA	Use control unit installed for the Ops Center Control Room
Install Vortex fire suppression system.	$3,800	The Vortex system will be a multi-zone system. The Vortex water tank, cylinders, controls, valves, etc. provided for the Ops Center Control Room will also be used for the Ops Center Computer Room. This cost includes the necessary piping.



NOTE!

● INDICATES 55 TON BEARING CAPACITY PILE (TENSION CAPACITY EQUALS 28 TONS).

⊗ INDICATES BATTER PILE. (BATTER = 1 HORIZ. TO 4 VERTICAL)

SEE DRWG. NO. CT-S-406 FOR TYP. PILE DETAILS.

PILE CUT-OFF EL. TO BE 109.12 EXCEPT AS OTHERWISE NOTED.

REGISTERED PROFESSIONAL ENGINEER — FREDERICK N. VAN KIRK — No. C13286 — CIVIL ENGINEER — STATE OF CALIFORNIA

NO	DATE	REVISIONS	BY	APPR'D
2	7/71	AS-BUILT		

CONSOER TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS — SAN JOSE, CALIFORNIA

APPROVED
CT&A — FARTHER
EBMUD — MGR. W.W.C.D.

DESIGNED W.F., E.H.
DRAWN W.F.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
PILE PLAN

DATE — SCALE 3/32"=1'-0"
DRWG. NO.
CT-S-401

71100

NOTE:

GRADE FLOOR CONSTRUCTION SHALL CONSIST OF 2½" THICK REINFORCED CONCRETE GROUT OVER 8" THICK PRECAST, PRESTRESSED STANDARD WEIGHT CONCRETE SLABS WITH LONGITUDINAL VOIDS EXCEPT AS OTHERWISE SHOWN OR NOTED.

WEIGHT OF PRECAST, PRESTRESSED CONCRETE SLABS SHALL BE APPROXIMATELY 65 LBS./SQ. FT.

PRECAST MANUFACTURER SHALL PROVIDE A NON-COMPOSITE SLAB DESIGN TO SUPPORT THE FOLLOWING SUPERIMPOSED LOADS:
LIVE LOAD -------- 100 LBS./SQ. FT.
DEAD LOAD 50 LBS./SQ. FT.
(INCLUDING WT. OF TOPPING)

SEE DRWG. NO. CT-S-406 FOR COLUMN SCHEDULE.

REGISTERED PROFESSIONAL ENGINEER — FREDERICK N. VAN KIRK — No. C13286 — CIVIL ENGINEER — STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT	YV	

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A Frederick N. Van Kirk — PARTNER
EBMUD E. E. Ross — MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
GRADE FLOOR PLAN

DATE JAN, 1974 SCALE 3/32"=1'-0" EXCEPT AS NOTED
DRWG. NO. CT-S-402

71100


HIGH ROOF PLAN 3/32"=1'-0"
TOP OF STEEL BEAMS & CHANNELS EL. 140.67
TYP. ANGLE FRAME DETAIL AT ROOF OPENINGS 1/2"=1'-0"
NOTE:
ALL BOLTED CONNECTIONS SHALL BE MADE W/ 3/4" A.S.T.M. A325 BOLTS EXCEPT AS OTHERWISE SHOWN OR NOTED. STANDARD CONNECTIONS SHALL BE CAPABLE OF SUPPORTING A.I.S.C. MAX. UNIFORM LOAD FOR INDICATED BEAM SIZE AND SPAN.
NOTE "A":
METAL DECK TO BE 1 1/2" THICK 16 GAGE STEEL (fs=20,000 P.S.I.) SHOP PAINTED RIBBED DECK. DECK SHALL HAVE A MINIMUM SECTION MODULUS OF .49 IN.3 AND SHALL BE CAPABLE OF SUPPORTING 55 LBS./SQ.FT. SUPERIMPOSED LOAD.
PROVIDE ONE 1/2"⌀ PLUG WELD IN EACH FLUTE AT SUPPORTS. WELD ALL LONGITUDINAL DECK JOINTS WITH 1 1/2" LONG SIDE SEAM WELDS AT 24" O.C. EXCEPT AS OTHERWISE NOTED ON KEY PLAN. PROVIDE MARGINAL PUDDLE WELDS AT 18" O.C. WHERE SPAN OF DECK IS PARALLEL TO SUPPORT.
KEY PLAN FOR METAL ROOF DECK WELDS 1"=60'-0"
MANSARD FRAMES SEE ARCH. DRWGS. FOR DETAILS
1 1/2" MTL. DECK (SEE NOTE "A") T/ DECK EL. 127.46
23 EQUAL SPACES @ 4'-0"=92'-0"
30 EQ. SPACES @ 4'-0"=120'-0"
17 EQUAL SPACES @ 4'-0"=68'-0"
22 EQUAL SPACES @ 4'-0"=88'-0"
11 EQUAL SPACES @ 4'-0"=44'-0"
DETAIL "W" 1/2"=1'-0"
VIEW "X" 1/2"=1'-0"
DETAIL "Y" 1"=1'-0" (TYP. BM. SEAT DET. FOR W16)
VIEW "Z" 1"=1'-0"
NOTE: ALL OTHER BM. TO COL. CONNECTIONS @ COL'S. C6 & E8 SHALL BE STD. BOLTED CONNECTIONS
REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN KIRK No. C13286 CIVIL ENGINEER STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT	YV	

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED CT&A PARTNER
EBMUD MGR. WPCD

DESIGNED W.T. DRAWN W.T. CHECKED E.H.

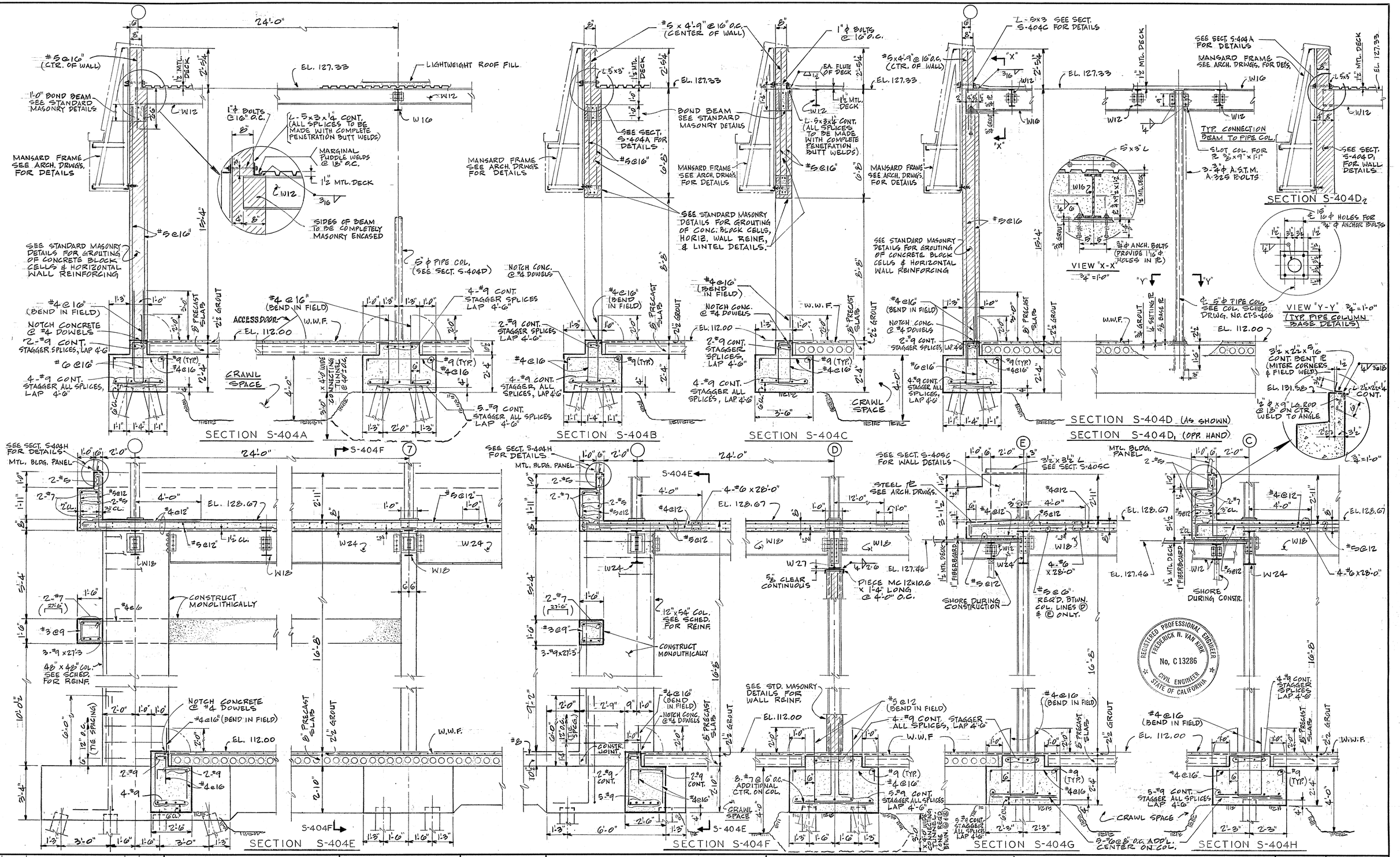
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
ROOF PLAN

DATE JAN., 1974 SCALE 3/32"=1'-0" EXCEPT AS NOTED
DRWG. NO. CT-S-403

71100



NO.	DATE	DESCRIPTION	BY	APPR'D			
2/79		AS-BUILT	SW				
REVISIONS							

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A Frederick N. Van Nirk PARTNER
EBMUD E E Rue MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
SECTIONS

DATE JAN. 1974 SCALE 3/8" = 1'-0"
DRWG. NO.
CT-S-404

71100

SECTION S-405A

SECTION S-405B

SECTION S-405C

SECTION S-405D

SECTION S-405D1

SECTION S-405E

SECTION S-405F

SECTION S-405G

SECTION S-405H

SECTION S-405H

DETAIL 'W'

DETAIL 'X'

DETAIL 'Y'

DETAIL 'Z'

VIEW 'U-U'

VIEW 'V-V'

SECTION S-405J1

PLAN AT GRADE LEVEL

PLAN AT GALLERY LEVEL

SECTION S-405J

SECTION S-405K

SECTION S-405L

STAIR EXIT "C" - PLANS AND SECTIONS

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/70	AS-BUILT	XV	

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A PARTNER
EBMUD MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

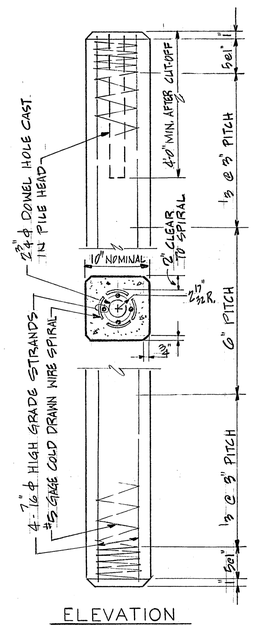
WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
PLANS, SECTIONS & DETAILS

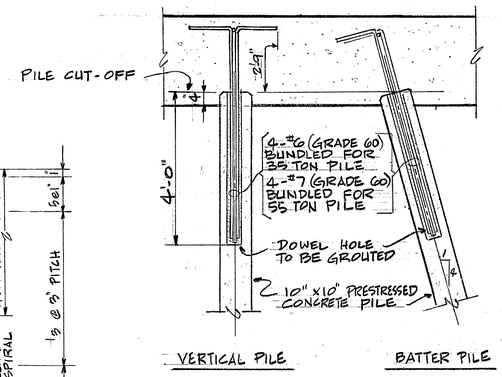
DATE JAN, 1974 SCALE AS NOTED
DRWG. NO.
CT-S-405

REGISTERED PROFESSIONAL ENGINEER
FREDERICK N. VAN KIRK
No. C 13286
CIVIL ENGINEER
STATE OF CALIFORNIA

71100



ELEVATION
1" = 1'-0"



PILE CAP DETAIL 1/2" = 1'-0"
(TYP. EXCEPT AS OTHERWISE SHOWN OR NOTED)

NOTES:

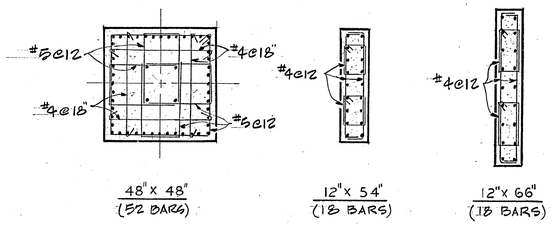
CONCRETE
CEMENT: TYPE II PRESTRESS
f'_c = 6000. P.S.I. @ 28 DAYS
f_{ci} = 3,500. P.S.I. @ TRANSFER
AGGREGATE: 1" MAX.
STEAM CURE AS PER STATE OF CALIF. STANDARD SPECS. 90-7.04

PRESTRESSING:
STRANDS 7/16" DIA. A.S.T.M. A416-68 GRADE 270
A = 0.115 SQ. IN.
MIN. BREAKING STRENGTH = 31,000#
INITIAL TENSION = 21,700# / STRAND MIN.
WORKING FORCE = 20,700#
EFFECTIVE PRESTRESS = 720 P.S.I.

TYPICAL PILE DETAILS
10" SQUARE PRESTRESSED CONCRETE PILE

COLUMN SCHEDULE

COLUMN MARK	B2, C2, B3, C3 B4, C4, B5 C5, B6, G6 E9, E10, E11	C6, E8	D7	C8, E6	C7, E7	D6, D8	F8
HIGH ROOF		COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	
COL. SIZE		W8x24	W8x28	W8x24	W8x24	W8x24	
				1" x 12½" x 1'-0½" BASE PL	1" x 12½" x 1'-0½" BASE PL	1" x 12½" x 1'-0½" BASE PL	
ROOF & PENTHOUSE FL.	COL. CUT-OFF EL. 127.25	COL. SPLICE EL. 128.75	COL. SPLICE EL. 128.75	BOTT. OF BASE PL EL. 128.67	BOTT. OF BASE PL EL. 128.67	BOTT. OF BASE PL EL. 128.67	COL. CUT-OFF EL. 127.25
COL. SIZE	5½" ϕ STD. STL. PIPE COL. (14.62 #/FT.)	W8x31	W10x60	42" x 42" 52 - #11	12" x 54" 18 - #11	12" x 66" 18 - #11	W10x21
							5/8" x 11" x 0'-11" BASE PL
GRADE FL.	5/8" x 10" x 0'-10" BASE PL	1" x 14" x 1'-2" BASE PL	1¾" x 20" x 1'-8" BASE PL				BOTT. OF BASE PL EL. 111.87
	BOTT. OF BASE PL EL. 111.87	BOTT. OF BASE PL EL. 111.87	BOTT. OF BASE PL EL. 111.81				

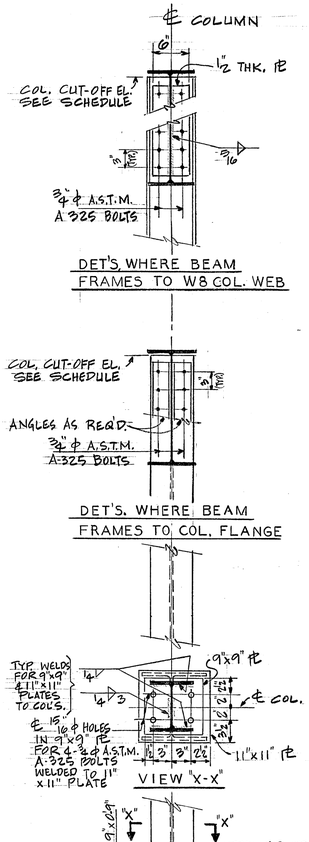


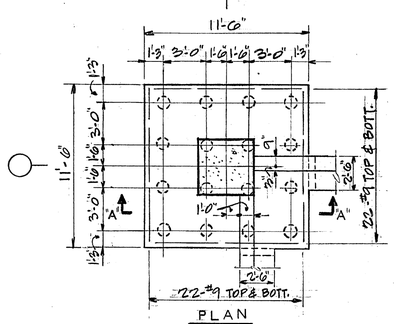
48" x 48" (52 BARS) — 12" x 54" (18 BARS) — 12" x 66" (18 BARS)

NOTE!
CONCRETE COLUMNS SHALL HAVE DOWELS FROM FOUNDATIONS OR CONSTRUCTION BELOW OF SAME SIZE & SPACING AS COL. VERTICAL STEEL.

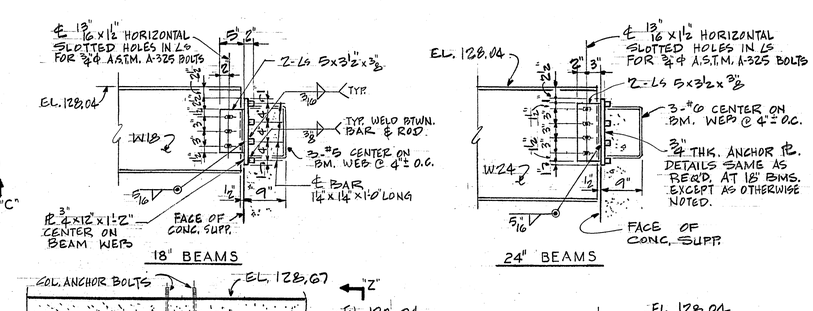
SEE SECTIONS S-404E, S-404F & FOR CONCRETE COLUMN ELEVATIONS.

TYPICAL CONCRETE COLUMN TIE DETAILS 3/8" = 1'-0"





TYPICAL PILE CAP DETAILS
3/16" = 1'-0"



TYPICAL CONNECTION DETAILS
STEEL BEAM TO CONCRETE COLUMN 3/4" = 1'-0"

NO.	DATE	DESCRIPTION	BY	APPR'D
	4/79	AS-BUILT	YW	

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS — SAN JOSE, CALIFORNIA

APPROVED
CT&A _____ PARTNER
EBMUD _____ MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

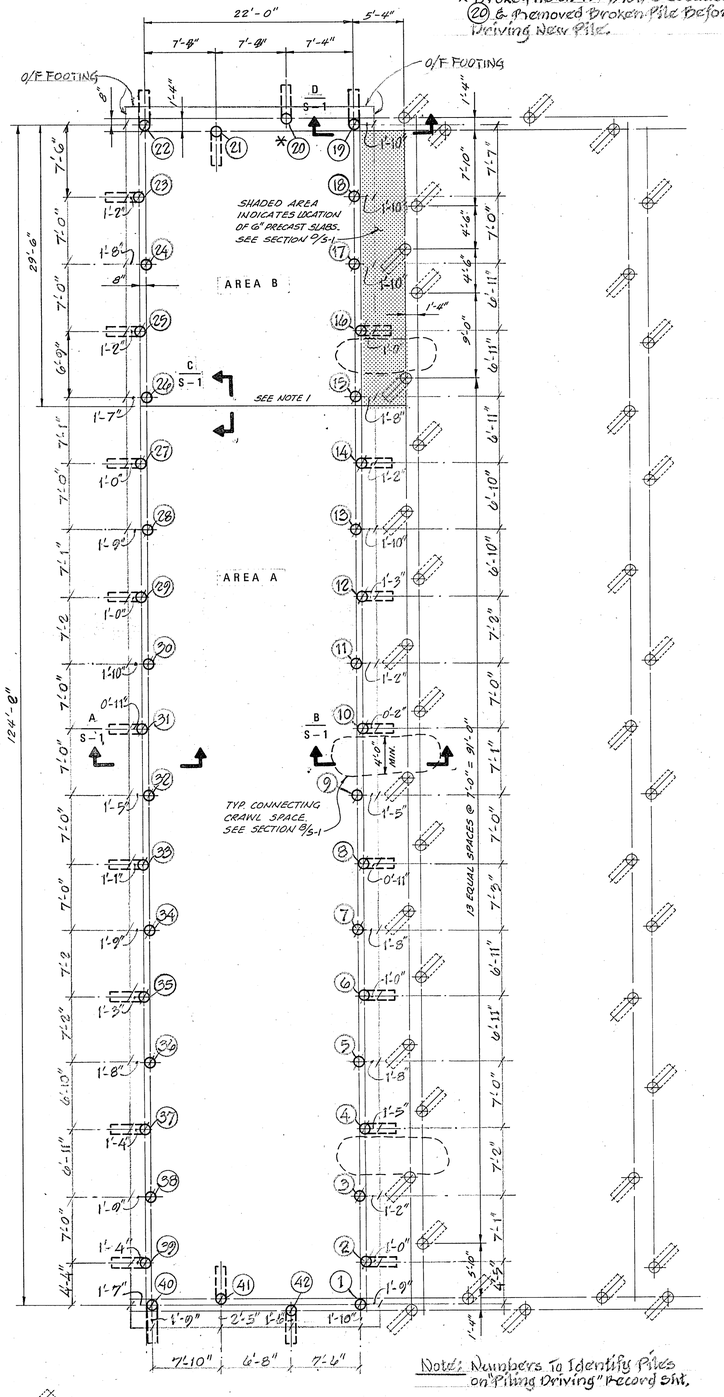
SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
COLUMN SCHEDULE & DETAILS

DATE JAN., 1974 SCALE AS NOTED
DRWG. NO.
CT-S-406

REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN VORST No. C 13286 CIVIL ENGINEER STATE OF CALIFORNIA

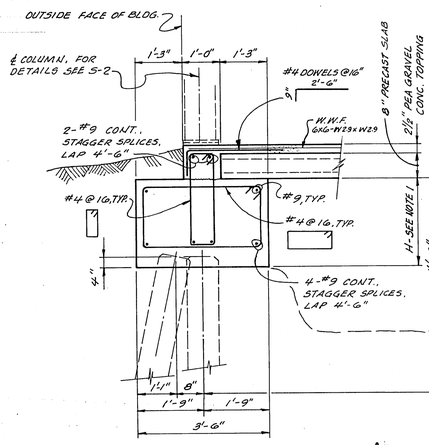
71100

* Broke Pile on 1st Blow @ Location (20) & Removed Broken Pile Before Driving New Pile.

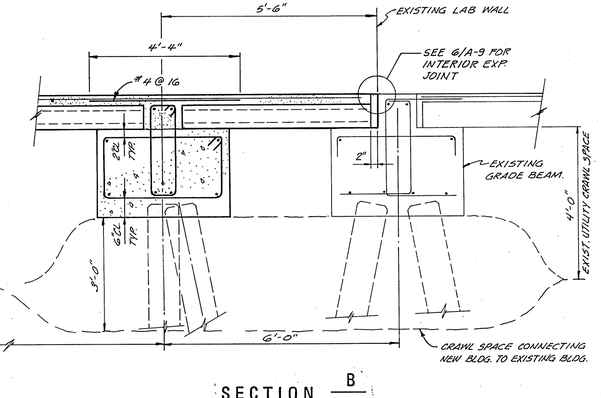


Note: Numbers To Identify Piles on "Piling Driving" Record Sht.

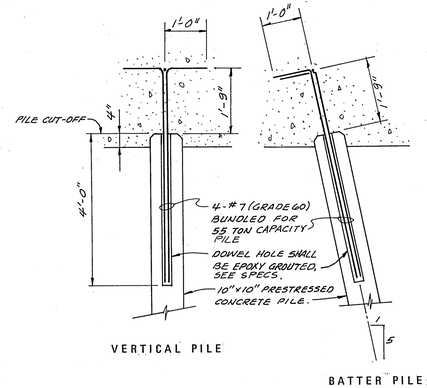
PILE PLAN
1/8" = 1'-0"



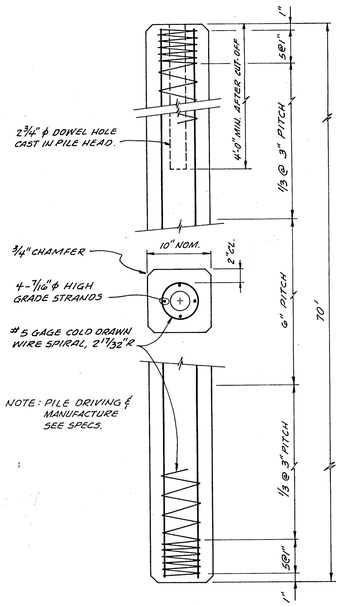
SECTION A/S-1
1/2" = 1'-0"



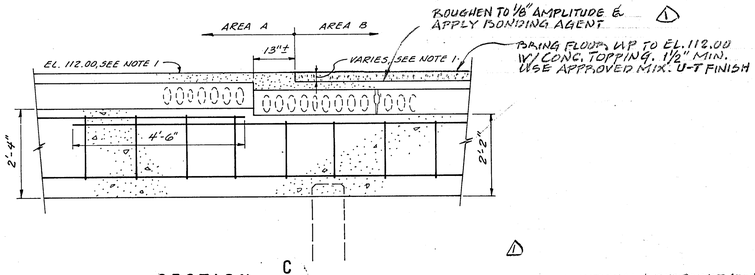
SECTION B/S-1
1/2" = 1'-0"



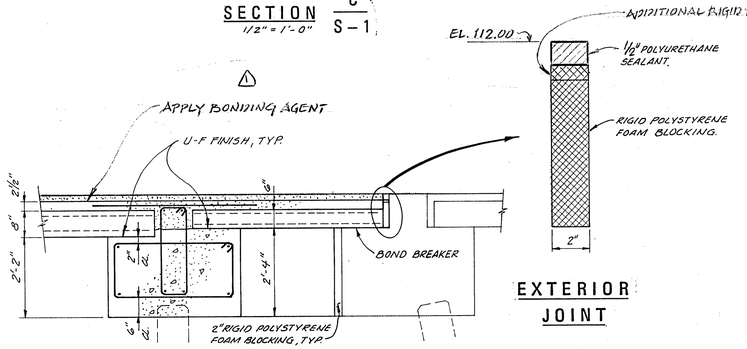
PILE CAP DETAIL
1/2" = 1'-0"



10" SQUARE PRESTRESSED CONCRETE PILE
1" = 1'-0"



SECTION C/S-1
1/2" = 1'-0"



SECTION D/S-1
1/2" = 1'-0"

EXTERIOR JOINT

NOTES

1. GRADE BEAM HEIGHT DIMENSION H SHALL BE 2'-4" IN AREA "A". AREA "B" SHALL HAVE H = 2'-2".

2. PEA GRAVEL CONCRETE TOPPING FINISHES: SEE SPECS.
   AREA A: U-F (UNFORMED, FLOAT)
   AREA B: U-TB (UNFORMED, TROWELED, HAIR BRUSH)

APPROVED Walter J. Bishop
MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED C.Way for
CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	As-Built	XX	
1	11/14/84	Revised for Storage Room	XX	DJS

DESIGN
DESIGN BY F. NESTLERODE / DJS
DESIGN CHECK BY D. Sexton
DRAWN BY T.W. BYRNE
REVIEW
PIPELINE — CORR — FNDN RJF
CIVIL — STRUCT. —
ELEC. — MECH. —
PROJ. ENG., DESIGN D. Sexton
SPVR., SPEC. PROJ. D.M. Dennis
RECOM.
MGR., DESIGN
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

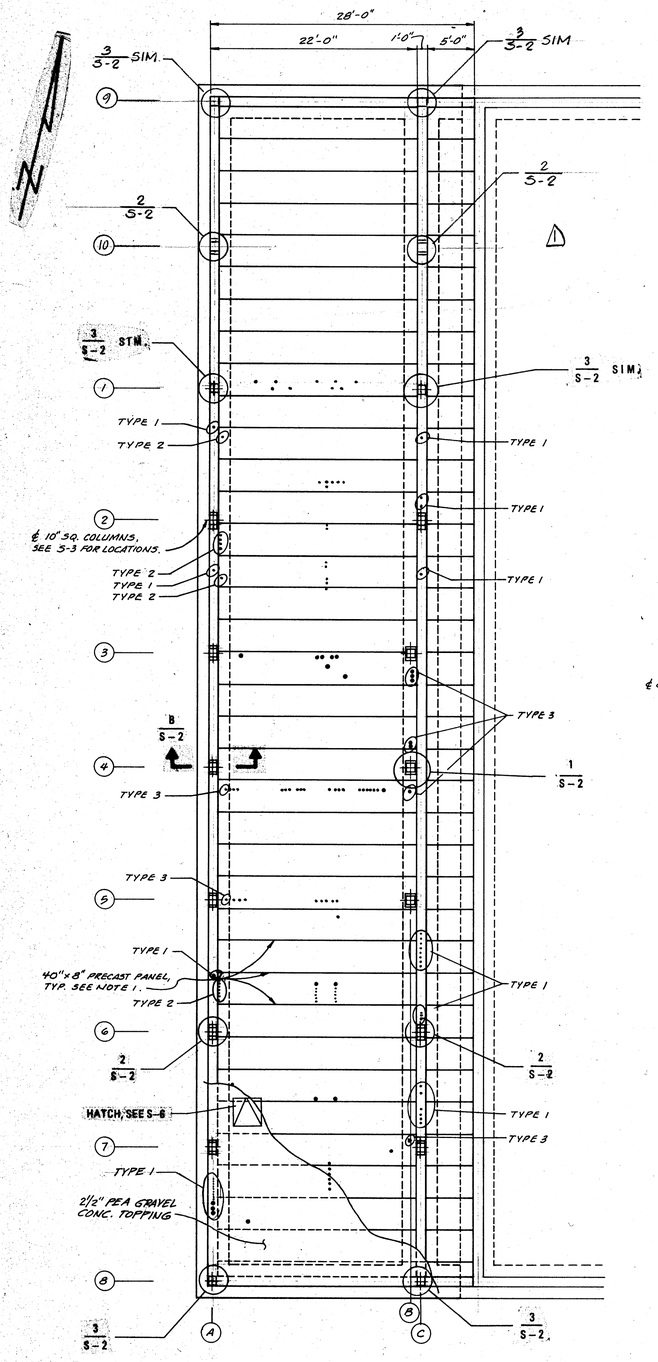
LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

PILE FOUNDATION PLAN & PILE DETAILS

STRUCTURE OR ZONE DESIGNATION
SCALE AS SHOWN
DATE 6 MARCH 84

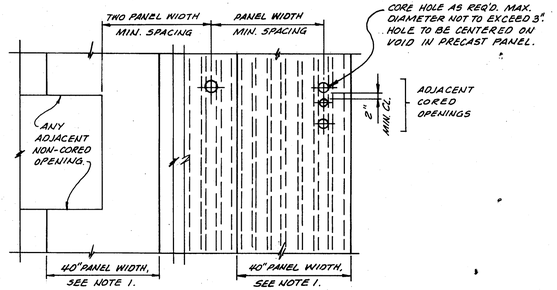
SD-S-1

E-160 • 3/82

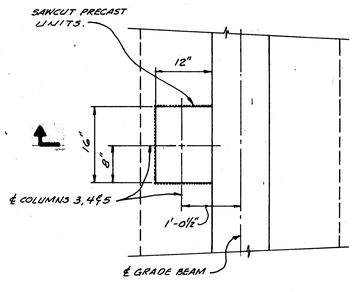


FLOOR PLAN
1/8" = 1'-0"

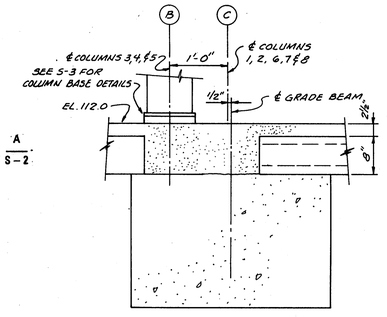
LEGEND
PIPE PENETRATIONS
HATCH



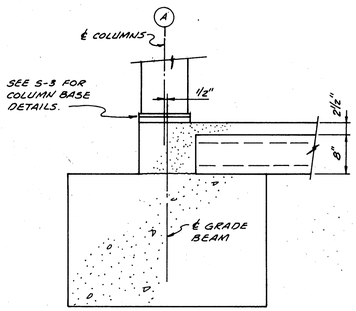
TYPICAL CORE OPENINGS IN PRECAST PANEL
NO SCALE



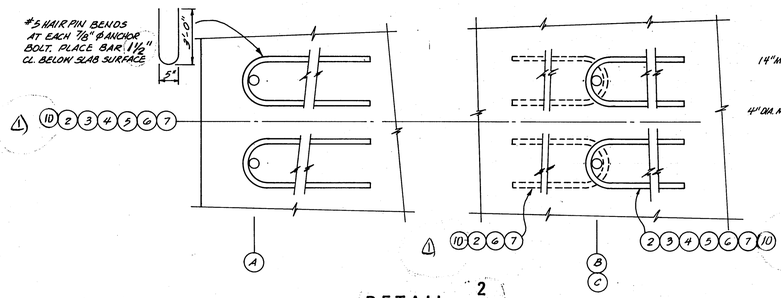
DETAIL 1/S-2
3/4" = 1'-0"



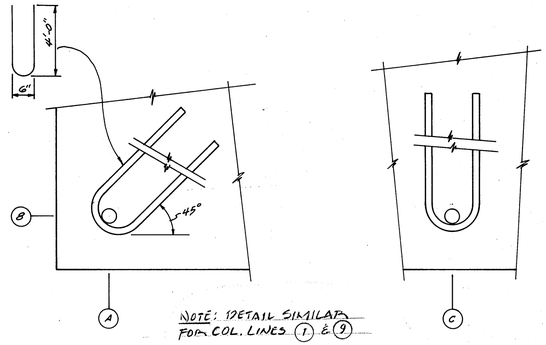
SECTION A/S-2
3/4" = 1'-0"



SECTION B/S-2
3/4" = 1'-0"

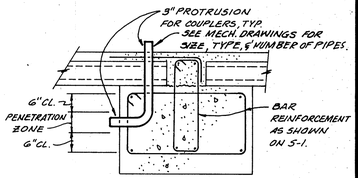


DETAIL 2/S-2
NO SCALE

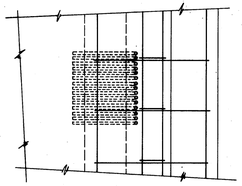


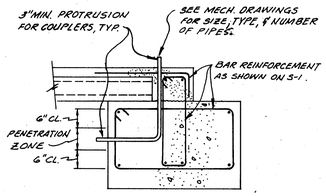
NOTE: DETAIL SIMILAR FOR COL. LINES 1 & 9

1 DETAIL 3/S-2
NO SCALE

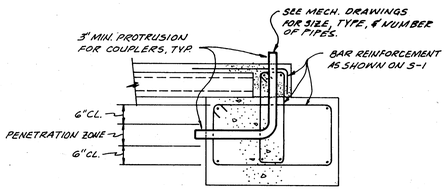


ELEVATION
TYPE 3 PIPE PENETRATIONS
1½" = 1'-0"


PLAN



ELEVATION
TYPE 2 PIPE PENETRATIONS
1½" = 1'-0"



ELEVATION
TYPE 1 PIPE PENETRATIONS
1½" = 1'-0"

NOTES

1. THE CONTRACTOR MAY SUBMIT ALTERNATIVE PRECAST CONCRETE PANEL SIZES AND DETAILS, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, SUBJECT TO THE REVIEW AND APPROVAL OF THE ENGINEER. SEE SPECIFICATIONS FOR SUBMITTAL REQUIREMENTS.
2. PRECAST CONCRETE PANEL SYSTEMS SHALL ACCOMMODATE ALL FLOOR PENETRATIONS AND OPENINGS INDICATED ON THE FLOOR PLAN AND ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.
3. REFER TO THE SPECIFICATIONS FOR PRECAST CONCRETE PANEL LOAD REQUIREMENTS.
4. ALL PENETRATIONS AND OPENINGS SHALL BE 12" MIN. CLEAR OF COLUMNS.
5. ALL PIPE PENETRATIONS ON THIS DRAWING ARE SHOWN SYMBOLICALLY. ACTUAL PENETRATION LOCATIONS, SIZES, AND NUMBER OF PENETRATIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO MANUFACTURE OF PRECAST FLOOR PANELS AND CONSTRUCTION OF GRADE BEAMS.
6. SEE CIVIL, STRUCTURAL, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR DRAINS, HATCHES, PLUMBING, PIPE, CONDUITS, AND OTHER OPENINGS WHICH PENETRATE THE FLOOR AND GRADE BEAMS. NOT ALL PENETRATIONS ARE SHOWN ON THE FLOOR PLAN.

APPROVED Walter J. Bishop
MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED C.W. Seyfo
CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	AS-BUILT	XP	
1	NOV. 14, 84	ADDED STORAGE RM.	XV	10Z

DESIGN
DESIGN BY F. NESTLERODE / DFF
DESIGN CHECK BY D. Sexton
DRAWN BY T.W. BYRNE

REVIEW
PIPELINE — CORR — FNDN. DFF
CIVIL — STRUCT. —
ELEC. — MECH. MW
PROJ. ENG., DESIGN D. Sexton
SPVR., SPEC. PROJ. D.M. Brem

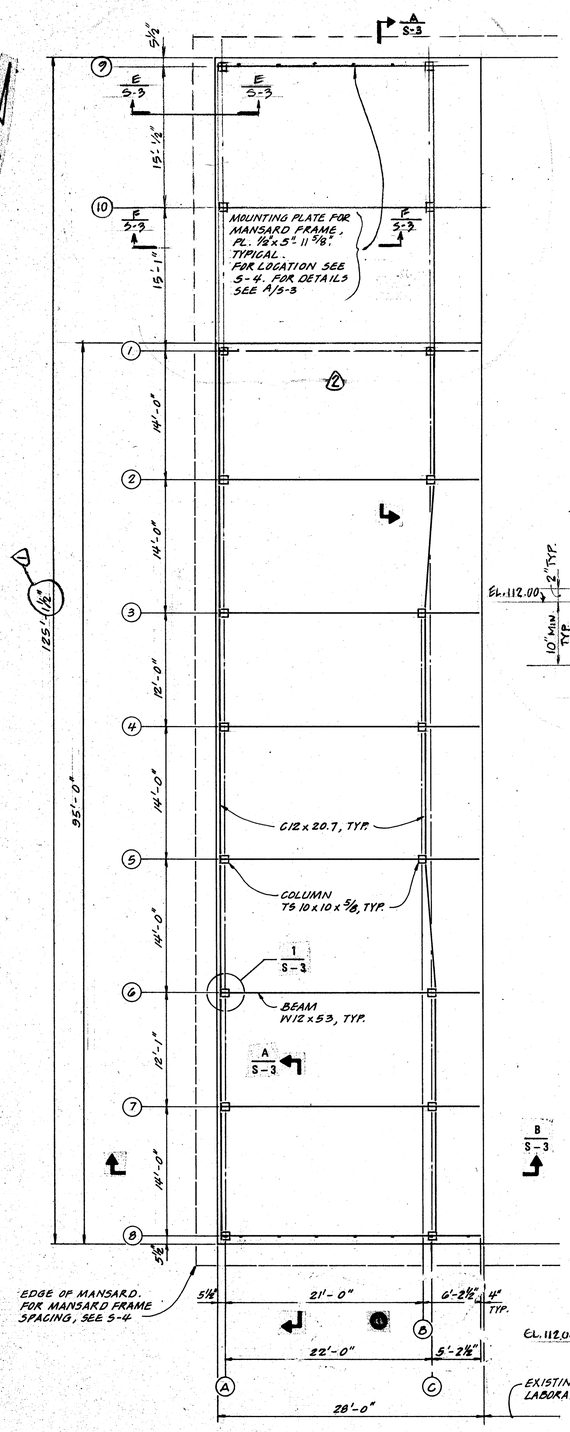
RECOM.
MGR., DESIGN
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA
LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL
FLOOR PLAN & DETAILS

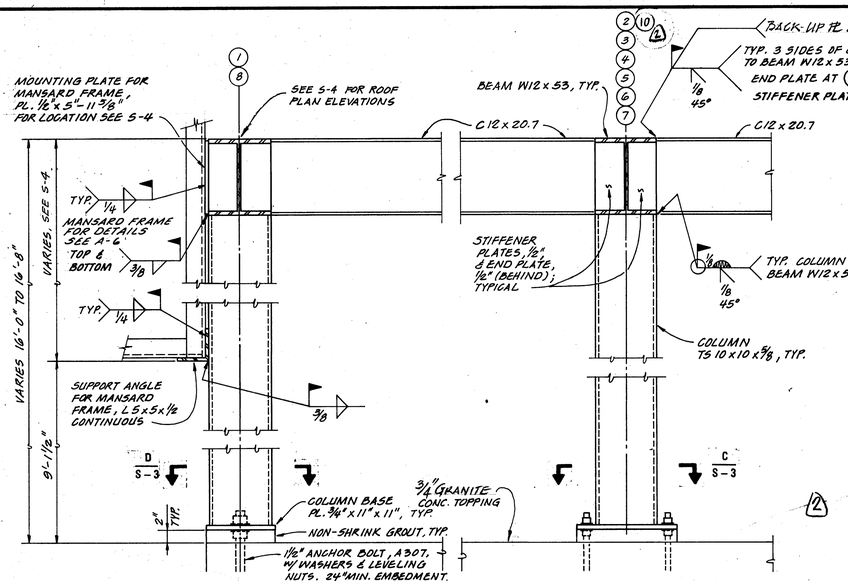
STRUCTURE OR ZONE DESIGNATION
SCALE AS SHOWN
DATE 6 MARCH 84

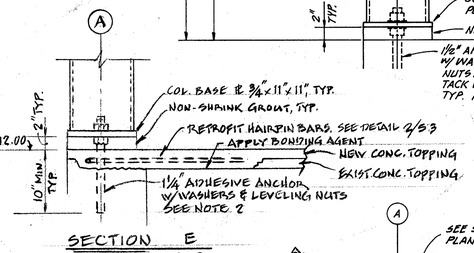
SD-S-2

E-160 • 3/82



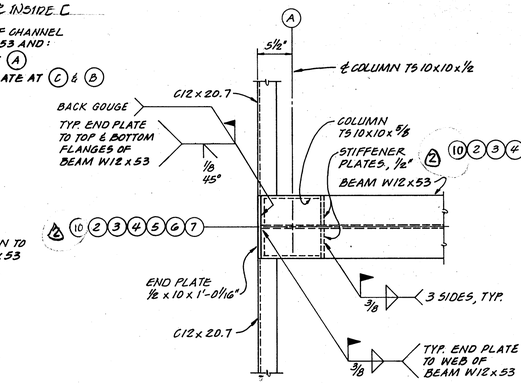
PLAN — STRUCTURAL FRAME
1/16"=1'-0"



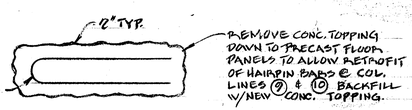


SECTION E
N.T.S. S-3

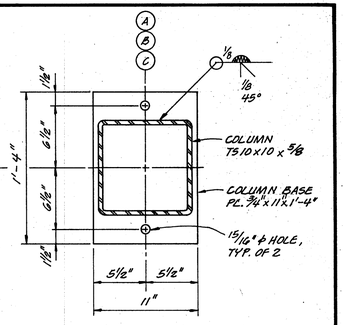
SECTION A
1"=1'-0" S-3



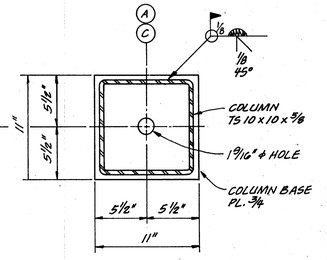
DETAIL 1
1"=1'-0" S-3



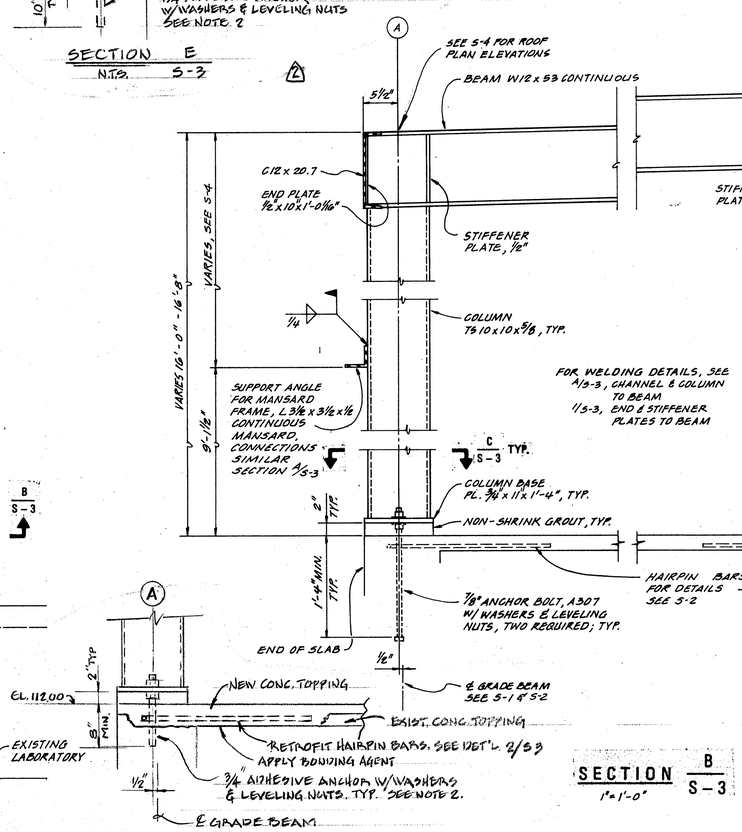
DETAIL 2
N.T.S. S-3



SECTION C
1 1/2"=1'-0" S-3



SECTION D
1 1/2"=1'-0" S-3



SECTION F
N.T.S. S-3

SECTION B
1"=1'-0" S-3

NOTES:

1. WELDING ROD SHALL BE E70XX.
2. ADHESIVE ANCHORS SHALL BE MOLLY PARABOND CAPSULE ANCHORS, HILTI HVA ADHESIVE ANCHOR, OR EQUAL. ANCHORS SHALL OTHERWISE CONFORM TO SPEC. SEC. 05070.

APPROVED: Walter J. Bishop
MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED: C Way for
CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	AS-built	XV	
2	NOV. 13, 84	ADDED STORAGE RM.	XV	DSF
1	14 AUG 84	REVISED DIMENSIONS	DSF	DSF

RECOM.

DESIGN / REVIEW

DESIGN BY	F. NESTLERODE / DSF
DESIGN CHECK BY	D. Sytsoo
DRAWN BY	E. JOW & M. FONG
PIPELINE — CORR — FNDN —	
CIVIL — STRUCT. SLL	
ELEC. — MECH. —	
PROJ. ENG., DESIGN	D. Sytsoo
SPVR., SPEC. PROJ.	D.M. Brem
MGR., DESIGN	Tom
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724	C Way

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

STRUCTURAL FRAME & DETAILS

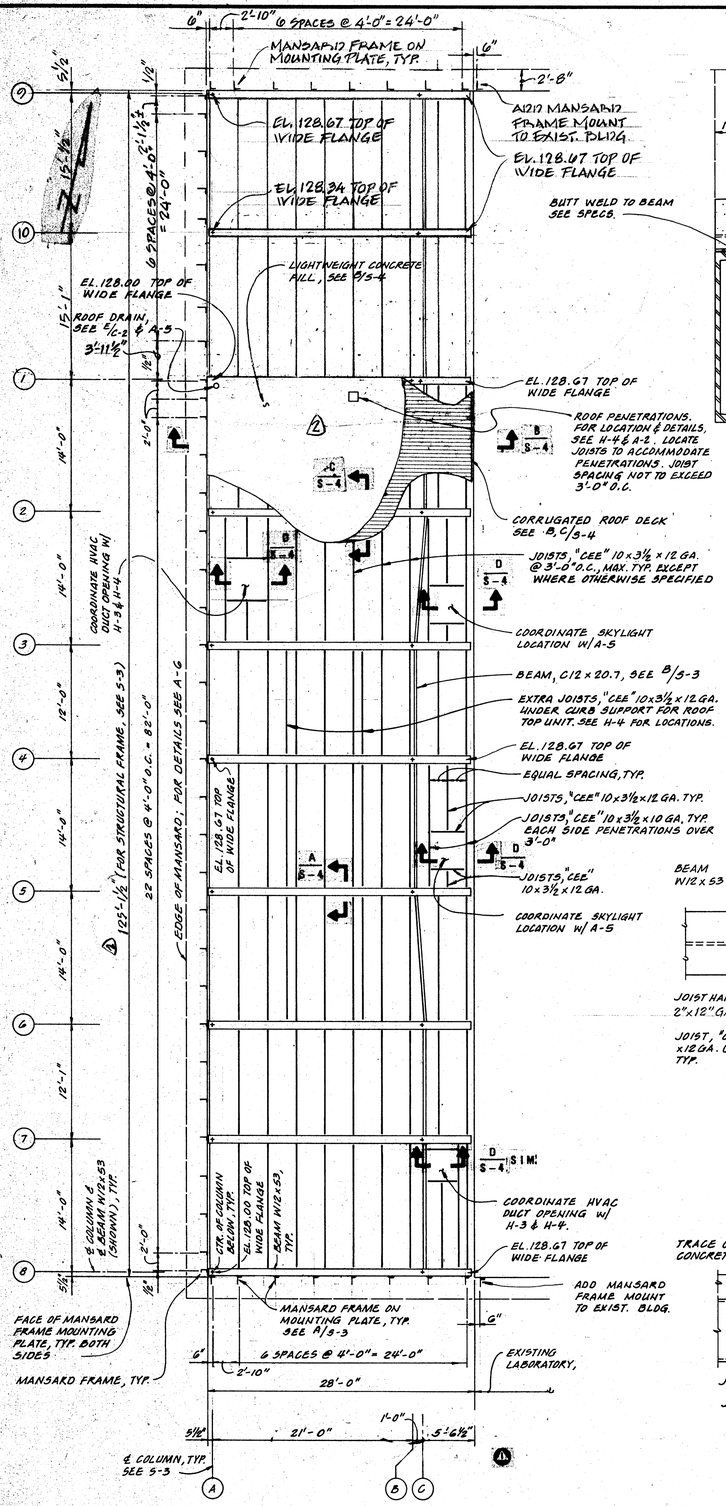
STRUCTURE OR ZONE DESIGNATION

SCALE AS SHOWN

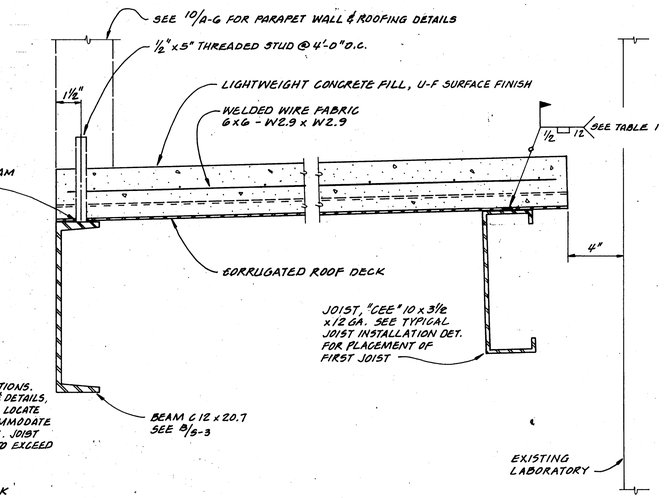
DATE G MARCH 84

SD-S-3

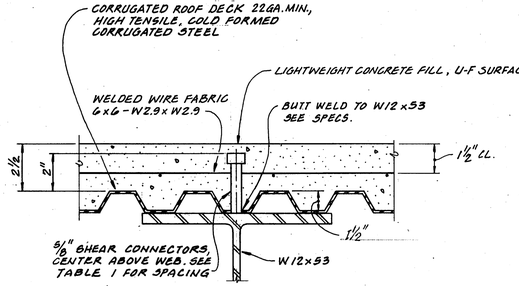
E-160 • 3/82



ROOF PLAN
1/8" = 1'-0"



SECTION B/S-4
3/16" = 0'-1"



SECTION C/S-4
3" = 1'-0"

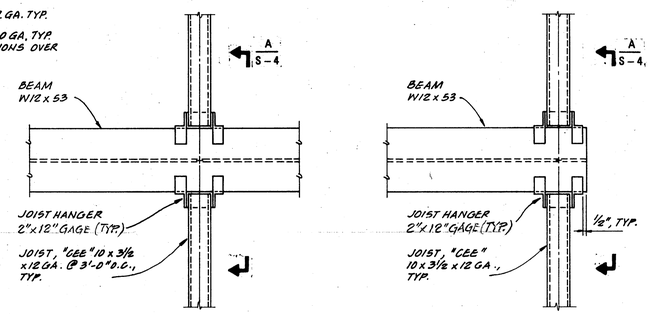
TABLE 1

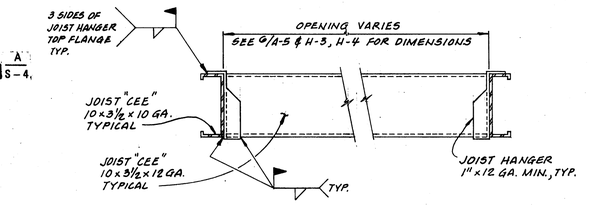
ANCHOR AND PLUG WELD SPACING SCHEDULE

SUPPORTING MEMBER	ALONG SUPPORTING MEMBER
JOIST, "CEE" 10 x 3-1/2 x 12 GA. & JOIST, "CEE" 10 x 3-1/2 x 10 GA.	1'-0" O.C., 1/2" PLUG WELDS
BEAM, W 12 x 53	1'-0" O.C. 3/4" SHEAR CONNECTORS
BEAMS, (2) C 12 x 20.7	1'-1½" O.C. 3/4" SHEAR CONNECTORS

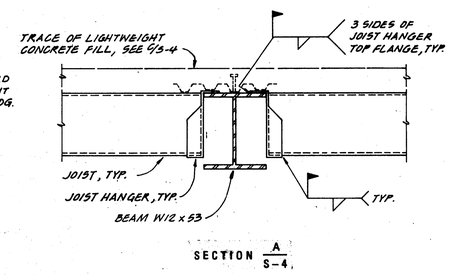
TYPICAL ROOF INSTALLATION DETAIL

THIS TYPICAL DETAIL SHOWS ATTACHMENT OF CORRUGATED ROOF DECK TO BEAM C12 x 20.7 AND JOIST. THE DECK IS ALSO ATTACHED TO BEAM W12 x 53 AS SHOWN ON A/S-4. FOR ROOF INSULATION, BUILT-UP ROOFING AND FLASHINGS NOT SHOWN, SEE A-5 AND A-6.





SECTION D/S-4
1" = 1'-0"



SECTION A/S-4

TYPICAL JOIST INSTALLATION DETAIL
1" = 1'-0"

NOTES

1. SLOPE OF ROOF SHALL BE CONSTANT BETWEEN SPOT ELEVATIONS GIVEN.

APPROVED _____ MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED _____ CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	As-Built		
2	NOV. 14, 84	ADDED STORAGE RM.		
1	14 AUG 84	REVISED DIMENSIONS		

DESIGN
DESIGN BY F. WESTLERODE/DSS
DESIGN CHECK BY D. Sotto
DRAWN BY E. JOW & M. PONG

REVIEW
PIPELINE — CORR — FNDN —
CIVIL — STRUCT. SLL
ELEC. — MECH. —
PROJ. ENG., DESIGN D. Sotto
SPVR., SPEC. PROJ. D.M. Dreier

RECOM.
MGR., DESIGN
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724

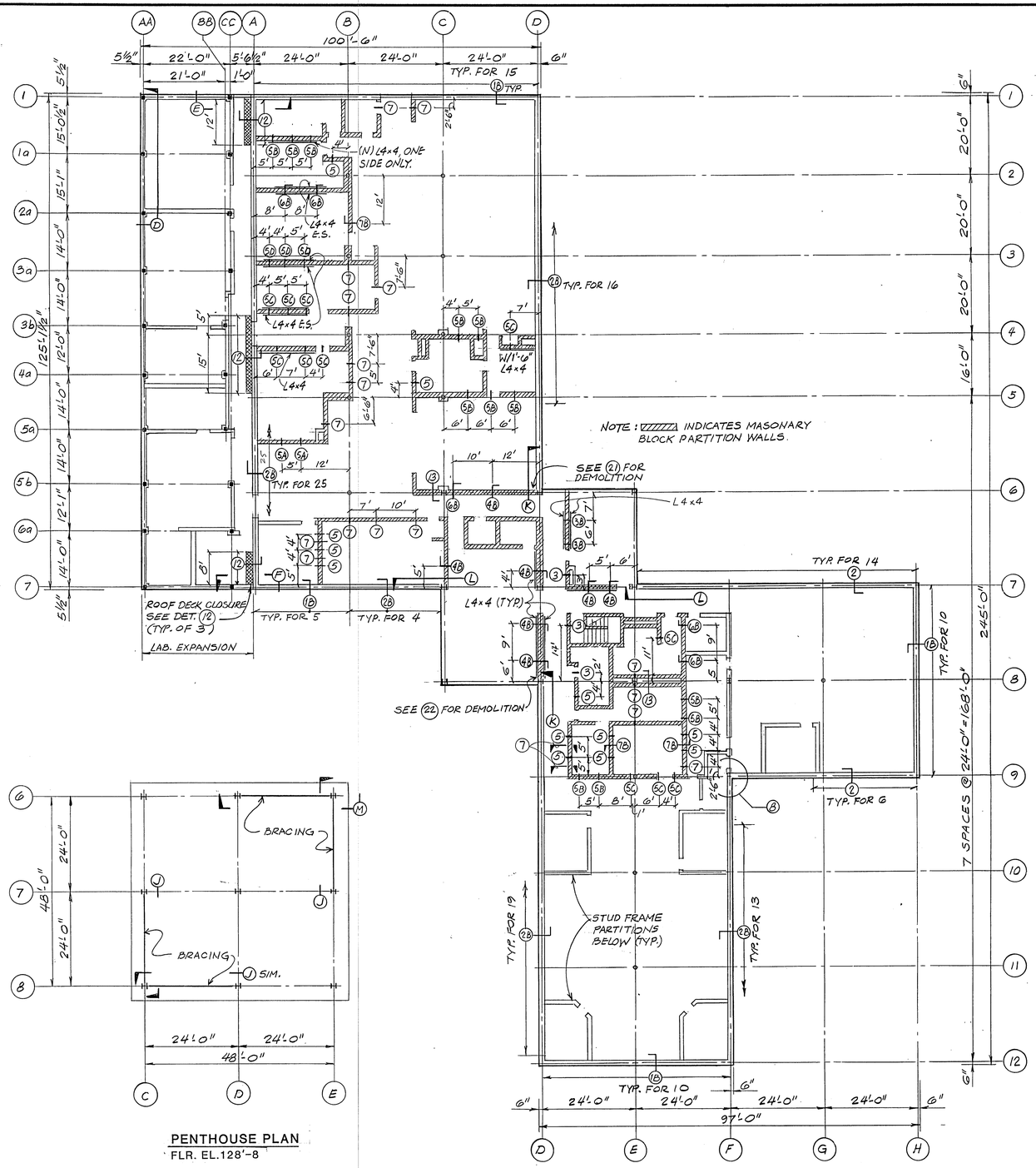
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

ROOF PLAN & DETAILS

STRUCTURE OR ZONE DESIGNATION
SCALE AS SHOWN
DATE 6 MARCH 84

SD-S-4



PENTHOUSE PLAN
FLR. EL.128'-8

ADMINISTRATION BUILDING | T.O.S. EL.127'-4"

KEY PLAN
SCALE: 1/16"=1'-0"

LIST OF DRAWINGS

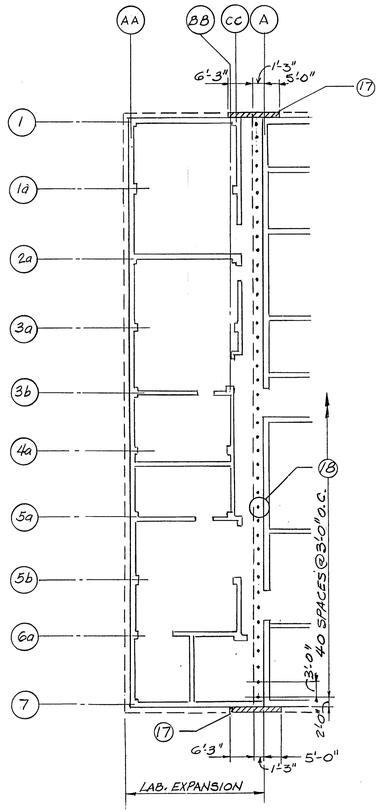
SHEET NO.	DRAWING NO.	DESCRIPTION
1	VG-1505	LOCATION MAP, VICINITY MAP, KEY PLANS AND LIST OF DRAWINGS
2	VG-1506	SECTIONS AND DETAILS SHEET 1 OF 3
3	VG-1507	SECTIONS AND DETAILS SHEET 2 OF 3
4	VG-1508	SECTIONS AND DETAILS SHEET 3 OF 3
5	VG-1509	ARCHITECTURAL DETAILS AND TYPICAL DETAILS

NOTE:

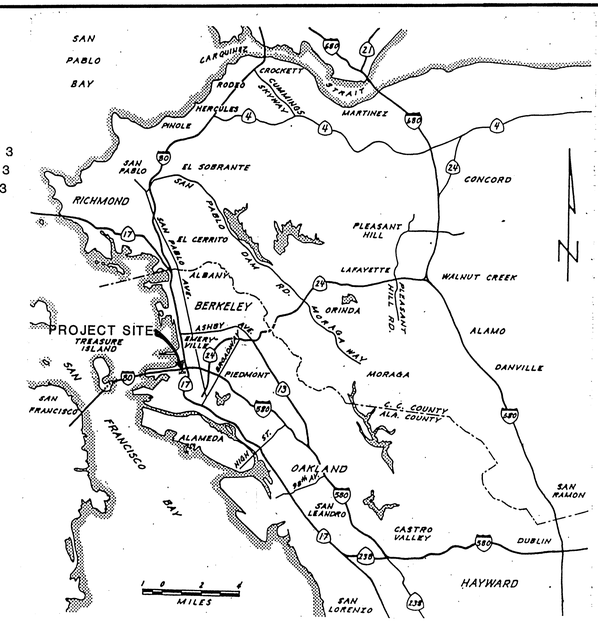
(1) (A) = Section A
(3) = Detail 3

(2) For Sections (A), (B) & (C) see Drawing VG-1506
For Sections (D) thru (H) see Drawing VG-1507
For Sections (J) thru (M) see Drawing VG-1508

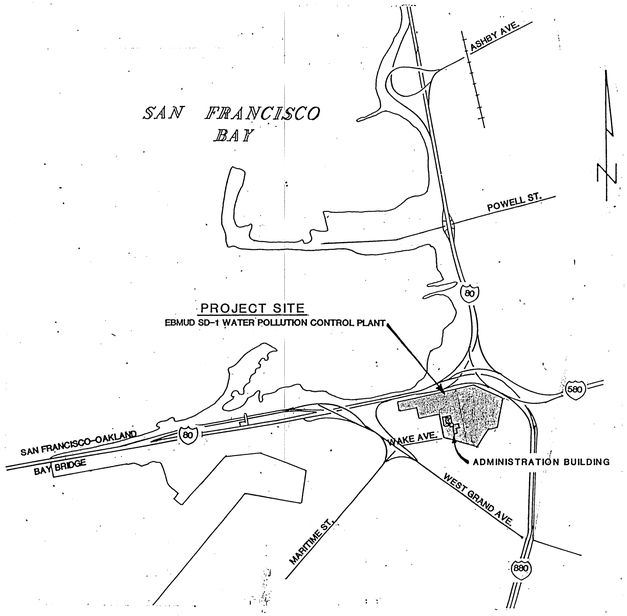
(3) For Details (1) thru (8) see Drawing VG-1506
For Details (9) thru (13) see Drawing VG-1507
For Details (14) thru (22) see Drawing VG-1508



PARTIAL FOUNDATION KEY PLAN
FLR. EL.112'-0"



LOCATION MAP



VICINITY MAP
N.T.S.

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 AS BUILT INSP. J.Farrell	RYE		

H. J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952
Degenkolb

JOB # 86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K. B. Haunschild
PROJECT MGR, R.P.E. No. C33317 E. H. McDermid
MGR. OF SUPPORT SERVICES R.P.E. No. C29111: Dennis M. Diemi
MANAGER OF WASTEWATER R.P.E. NO. C26855 Walter J. Bishop

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
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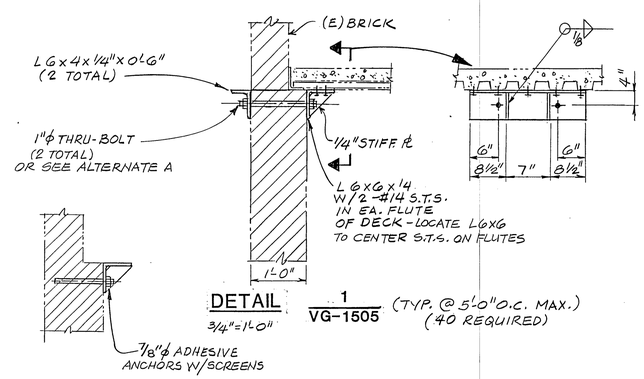
SD-176

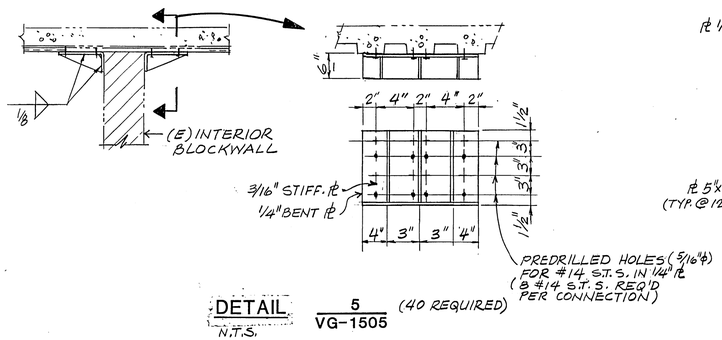
LOCATION MAP, VICINITY MAP, KEY PLANS AND LIST OF DRAWINGS

DRAWN BY R. M. EBY
SCALE AS SHOWN
DATE MAY 17, 1988
DRAWING No. VG-1505
SHEET 1 OF 5

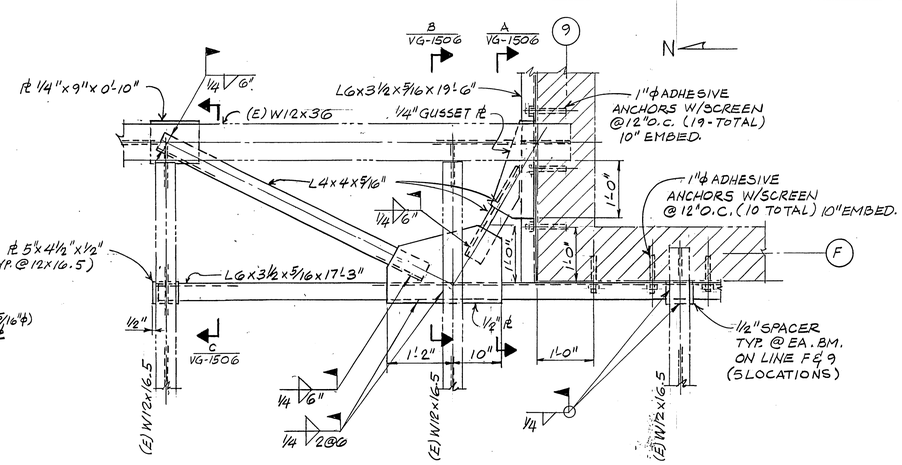
SD-167.1 10/87



DETAIL 1 / VG-1505 (TYP. @ 5'-0" O.C. MAX.) (40 REQUIRED)
3/4"=1'-0"

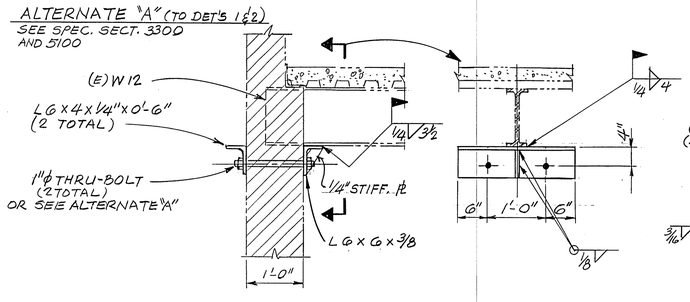


DETAIL 5 / VG-1505 (40 REQUIRED)
N.T.S.

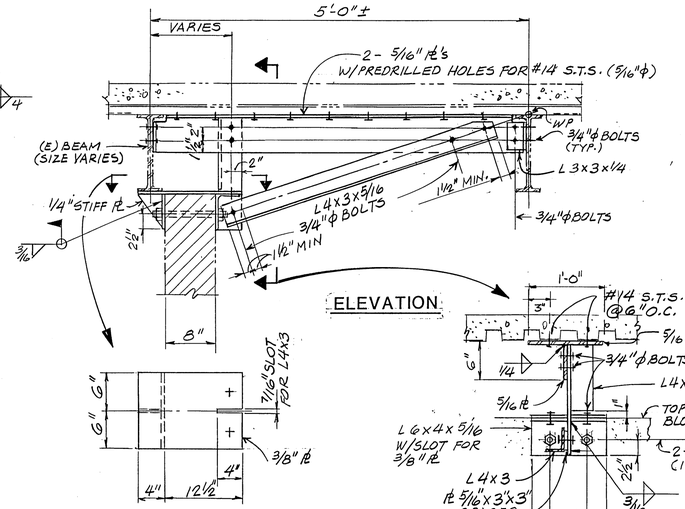


PLAN
DETAIL 8 / VG-1505
3/4"=1'-0"

ALTERNATE "A" (TO DET'S 1 & 2)
SEE SPEC. SECT. 3300 AND 5100

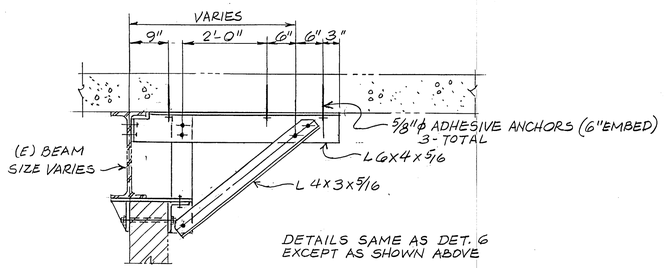


DETAIL 2 / VG-1505 (TYP. @ EA. BEAM) (97 REQUIRED)
3/4"=1'-0"



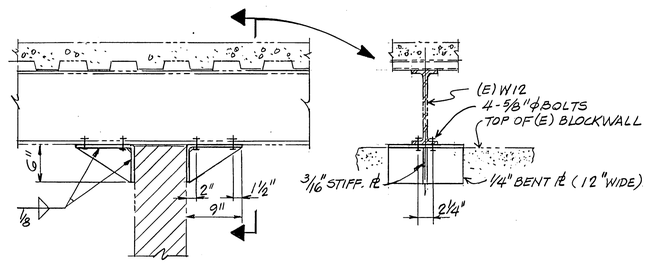
DETAIL 6 / VG-1505 (5 REQUIRED)
1"=1'-0"

DETAIL 3 / VG-1505 (5 REQUIRED)
3/4"=1'-0"

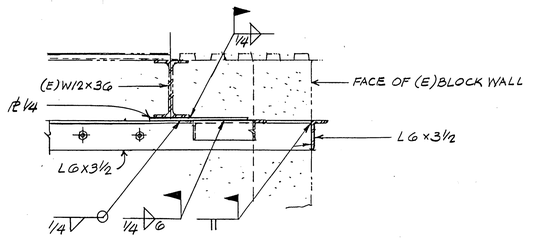


DETAILS SAME AS DET. 6 EXCEPT AS SHOWN ABOVE

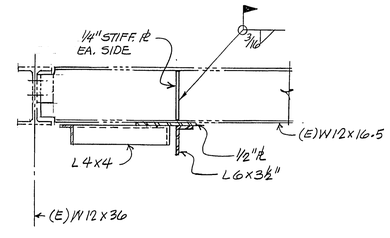
DETAIL 4 / VG-1505 (8 REQUIRED)
3/4"=1'-0"



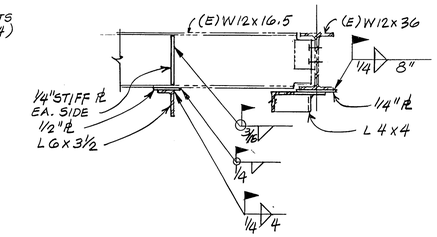
DETAIL 7 / VG-1505 (15 REQUIRED)
1"=1'-0"



SECTION A / VG-1506
3/4"=1'-0"



SECTION B / VG-1506
3/4"=1'-0"



SECTION C / VG-1506
3/4"=1'-0"

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

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	13DEC89	24MAR89 IN SERVICE AS BUILT INSP J. Farrell	RJE		

H. J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952
Degenkolb
JOB # 86042.02

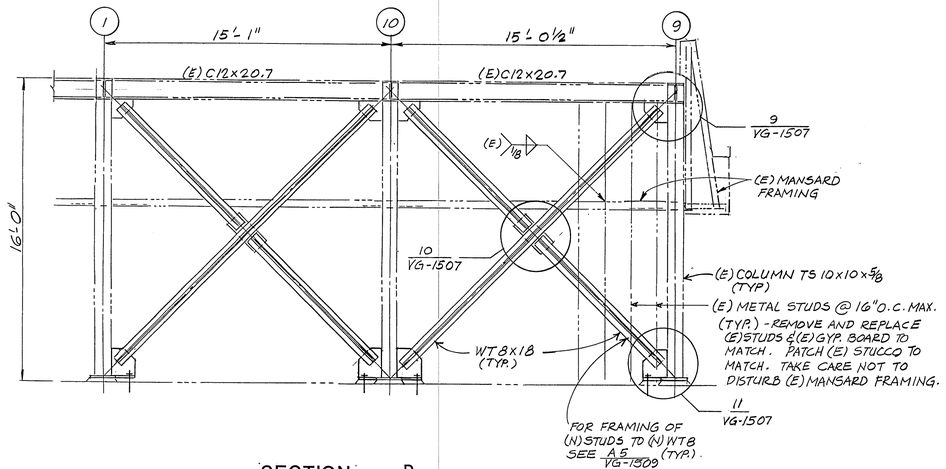
DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K. B. Hannaschild
PROJECT MGR. R.P.E. No. C 33317 E. H. McDermid
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111 Dennis M. Diemi
MANAGER OF WASTEWATER R.P.E. NO. C 36853 Walter J. Bishop

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176
SECTIONS AND DETAILS
SHEET 1 OF 3

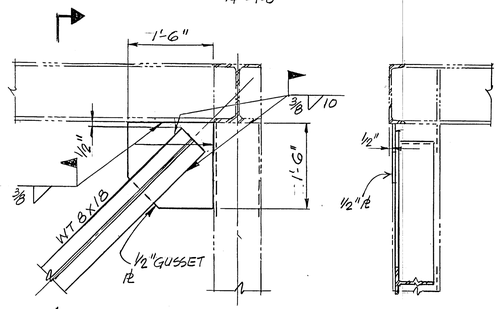
DRAWN BY R. M. EBY
SCALE AS SHOWN
DATE MAY 17,1988
DRAWING No. VG-1506
SHEET 2 OF 5

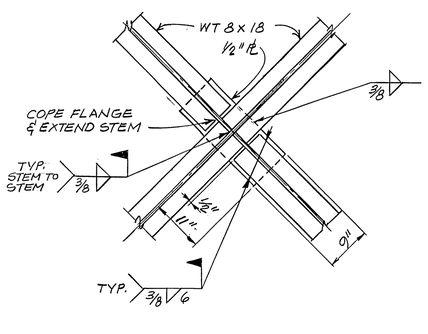
SD-167.1 10/87



SECTION D / VG-1505

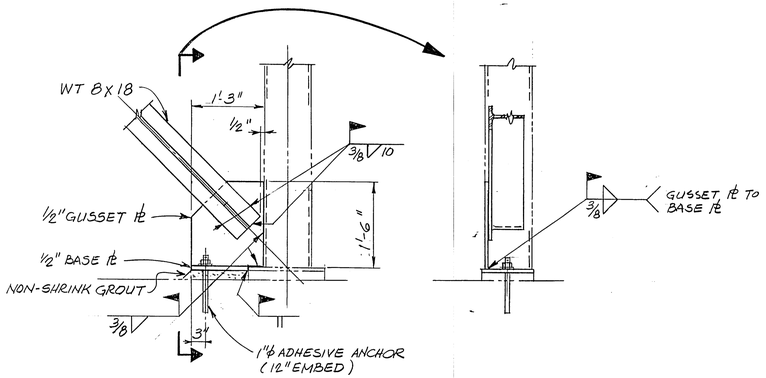
1/4" = 1'-0"



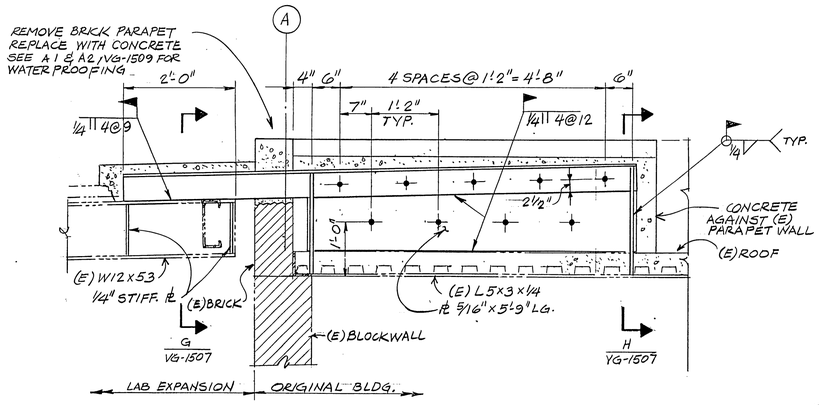


DETAIL 9 / VG-1507

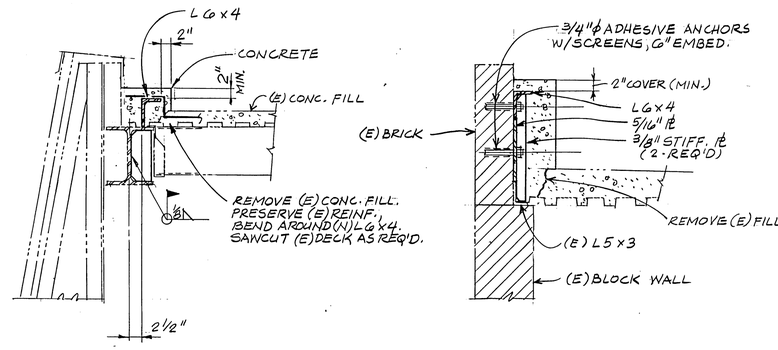
DETAIL 10 / VG-1507



DETAIL 11 / VG-1507

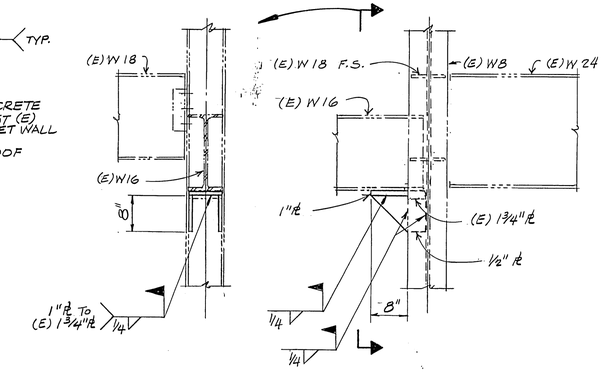


SECTION E / VG-1505 , SECTION F / VG-1505 (OPPOSITE HAND)

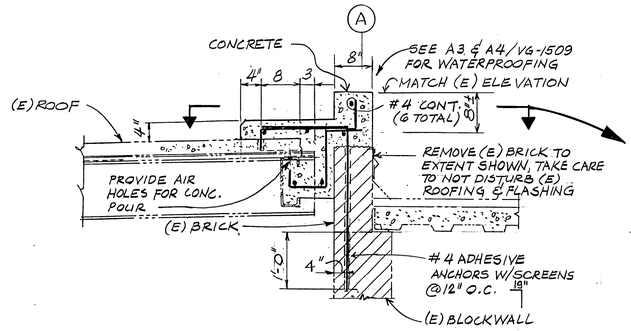


SECTION G / VG-1507

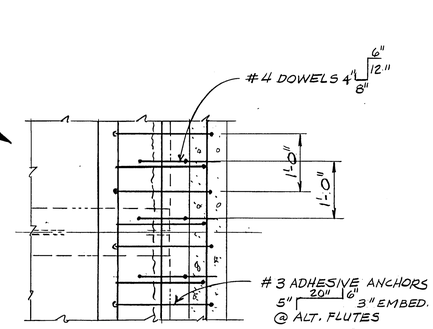
SECTION H / VG-1507



DETAIL 13 / VG-1505 (2 REQUIRED)



SECTION



PLAN

DETAIL 12 / VG-1505 (AT 3 PLACES)

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
2	13DEC89	24MAR89 IN SERVICE; AS BUILT INSP. J.Farrell	RJE		

H.J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952

Degenkolb

JOB # 86042.02

DESIGNED BY	DWC
DESIGN CHECKED BY	CDP
DRAWN BY	
SR. PROJ. ENGR.	DWC
APPROVED	
PRINCIPAL-IN-CHARGE, R.P.E. NO. C	

EBMUD

PROJECT ENG., R.P.E. No. C 33317: K.B. Hannaschild
PROJECT MGR., R.P.E. No. C 29111:
MGR. OF SUPPORT SERVICES, R.P.E. No. C 29111:
MANAGER OF WASTEWATER, R.P.E. NO. C 26960:

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

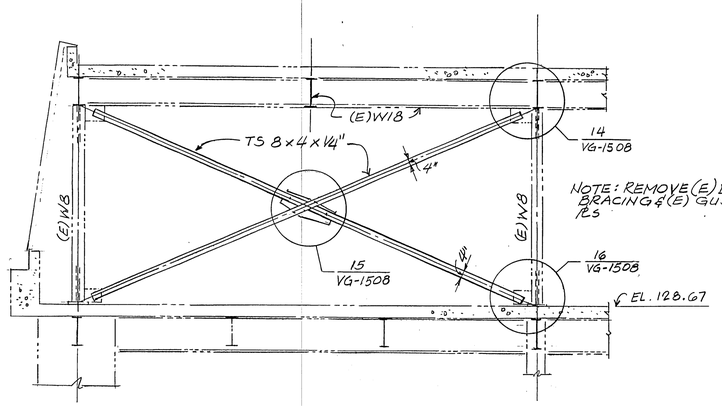
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

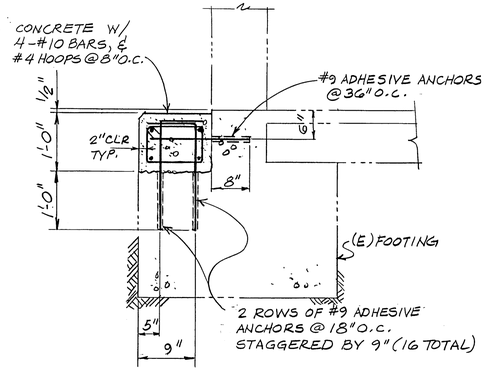
SHEET 2 OF 3

DRAWN BY	RMEBY
SCALE	3/4"=1'-0" U.O.N.
DATE	MAY 17, 1988
DRAWING No.	VG-1507
SHEET	3 OF 5

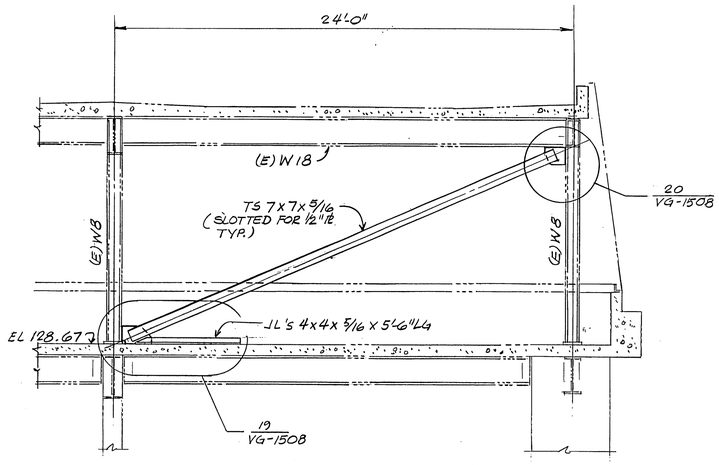
SD-167.1 10/87



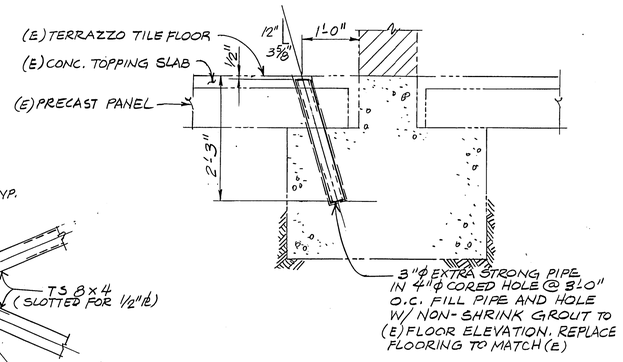
SECTION J VG-1505
1/4" = 1'-0"



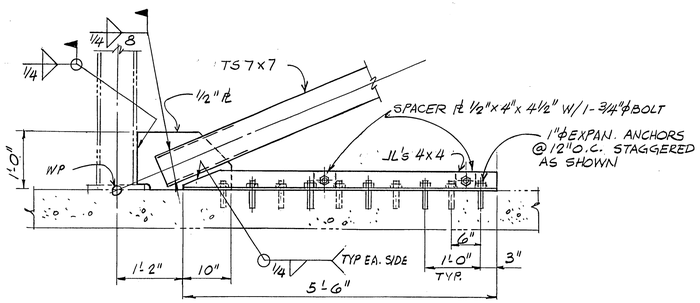
DETAIL 17 VG-1505 (AT 2 PLACES)
3/4" = 1'-0"



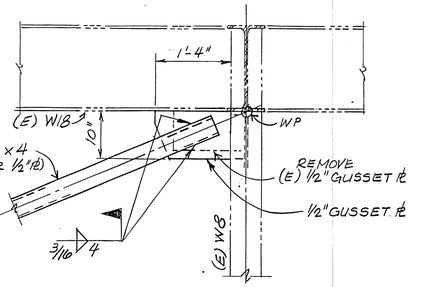
SECTION M VG-1505
1/4" = 1'-0"



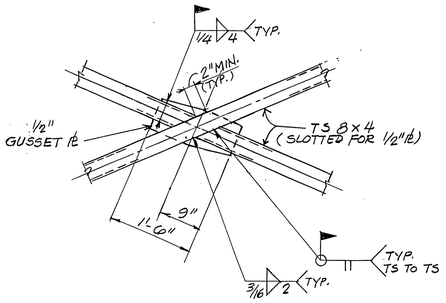
DETAIL 18 VG-1505 (41 REQUIRED)
3/4" = 1'-0"



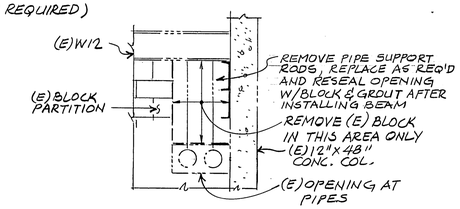
DETAIL 19 VG-1508
3/4" = 1'-0"



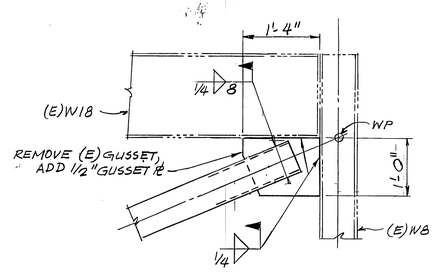
DETAIL 14 VG-1508
3/4" = 1'-0"



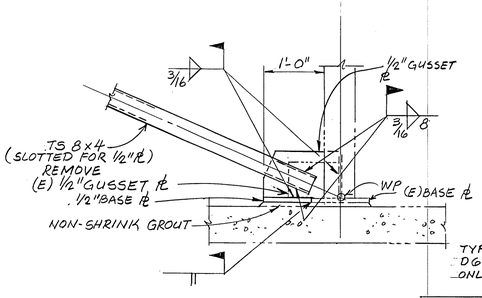
DETAIL 15 VG-1508
3/4" = 1'-0"



DETAIL 21 VG-1508
N.T.S.

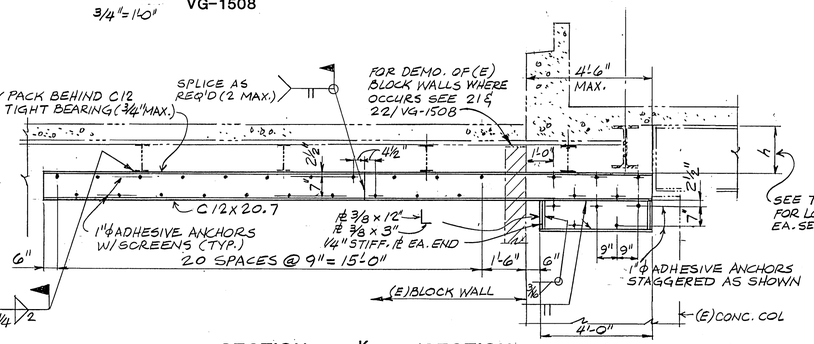


DETAIL 20 VG-1508
3/4" = 1'-0"

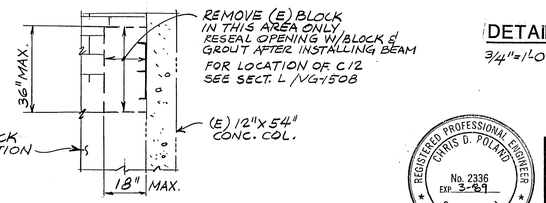


DETAIL 16 VG-1508
3/4" = 1'-0"

TABLE 1		
TOP OF C12 LOCATION		
COL.	h	COMMENTS
D8	52"	
E7	46"	LOWER 1" CONDUIT
D6	20 1/2"	MOVE 1" CONDUIT
C7	42"	



SECTION K VG-1505 , **SECTION** L VG-1505 (OPPOSITE HAND)
3/8" = 1'-0"



DETAIL 22 VG-1508
N.T.S.

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLARD No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13 DEC 89	IN SERVICE 24 MAR 89 AS BUILT INSP. J. Farrell	RJE		

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JOB # 86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K.B. Hounsechild
PROJECT MGR. R.P.E. No. C 33317
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111
MANAGER OF WASTEWATER R.P.E. NO. C 34455

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

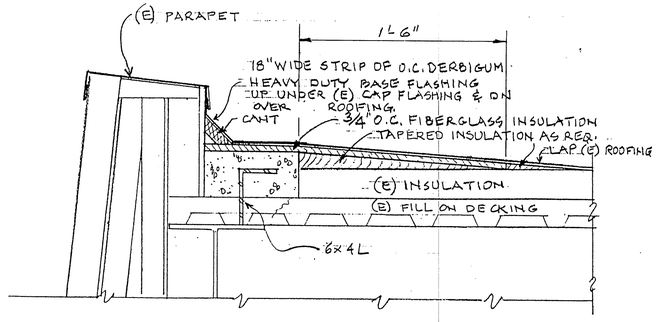
SECTIONS AND DETAILS

SHEET 3 OF 3

DRAWN BY R M EBY
SCALE AS SHOWN
DATE MAY 17, 1988

DRAWING No. VG-1508
SHEET 4 OF 5

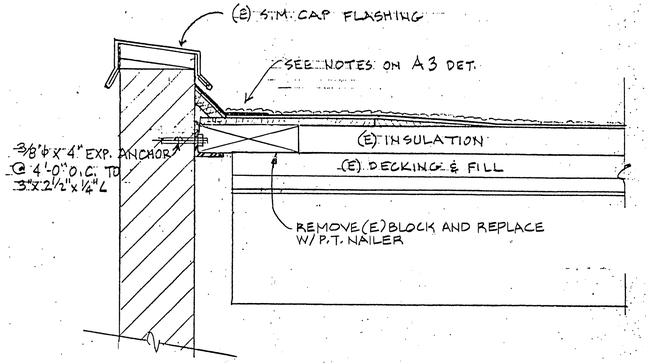
SD-167.1 10/87



FLASHING DETAIL A1 / VG-1507 (USE AT SECT'S E & F/VG-1507)

1½"=1'-0"

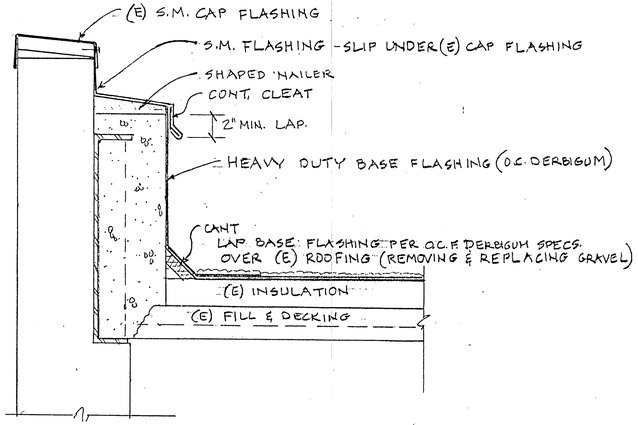
SEE KEY PLAN FOR ROOFING DETAIL LOCATION



REROOFING DETAIL A4 / VG-1507

1½"=1'-0"

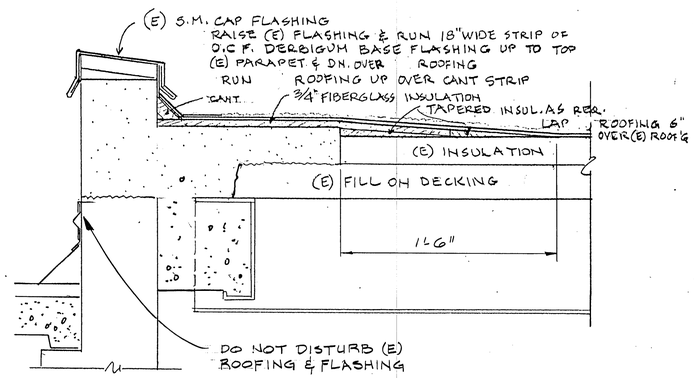
SEE KEY PLAN FOR ROOFING DETAIL LOCATION



FLASHING DETAIL A2 / VG-1507 (USE AT SECT'S E & F/VG-1507)

1½"=1'-0"

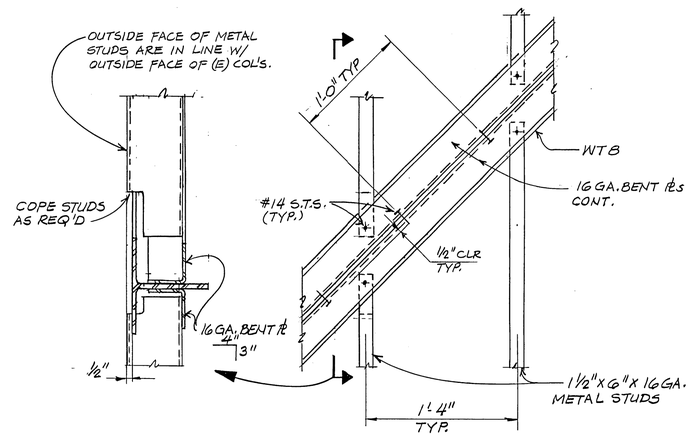
SEE KEY PLAN FOR ROOFING DETAIL LOCATION



REROOFING DETAIL A3 / VG-1507 (USE AT DET. 12/VG-1507)

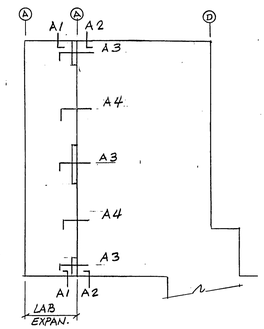
1½"=1'-0"

SEE KEY PLAN FOR ROOFING DETAIL LOCATION

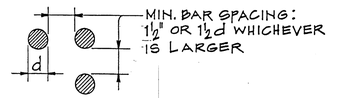


TYPICAL STUD FRAMING DETAIL A5 / VG-1507 (USE AT SECT. D/VG-1507)

1½"=1'-0"

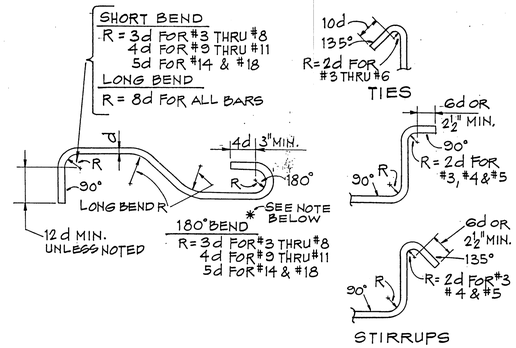


KEY PLAN FOR ROOFING DETAILS



NOTE:
COLUMN DOWELS, TYPICAL HORIZONTAL WALL STEEL AND TYPICAL WALL STEEL DOWELS MAY BE WIRED TOGETHER INSTEAD OF SPACING AS SHOWN ABOVE.

TYP. REINFORCING BAR SPACING DETAIL



TYP. HOOKS & BENDS DETAIL

FOR GRADE 60 STEEL

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 1985 EDITION OF THE UNIFORM BUILDING CODE AND THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
2. ALL CONCRETE SHALL BE STONE CONCRETE OF THE FOLLOWING CLASSES:

CLASS	28-DAY STRENGTH	USE
A	3250	ALL CONCRETE COLLECTOR BEAMS AT ROOF LEVEL, FOUNDATION STRENGTHENING
B	2500	SIDEWALKS

3. ALL REINFORCING STEEL SHALL CONSIST OF DEFORMED BARS CONFORMING TO ASTM A-615, GRADE 60.
4. ALL STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A-36 AND SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE EIGHTH EDITION OF THE A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, EIGHTH EDITION.
5. ALL BOLTS AND THREADED RODS SHALL CONFORM TO ASTM A-307.
6. ALL SELF-TAPPING SCREWS, DESIGNATED AS S.T.S. ON THESE DRAWINGS, ARE TO BE TEKS SCREWS BY BUILDEX, OR BY U.S. GYPSUM CO., OR EQUAL.

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	24MAR89 IN SERVICE; AS BUILT INSP. J. Farrell	RYE		

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DESIGN CHECKED BY CDP
DRAWN BY
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APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENGR. R.B. Haunschild
PROJECT MGR. R.P.E. No. C33317
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111
MANAGER OF WASTEWATER R.P.E. NO. C 26855

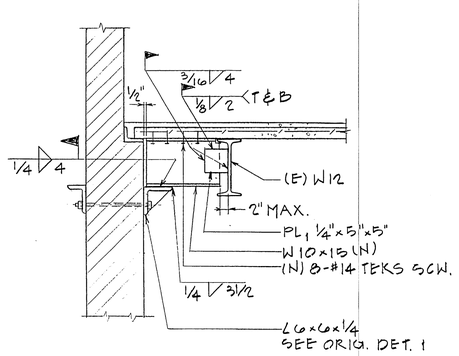
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

ARCHITECTURAL DETAILS AND TYPICAL DETAILS

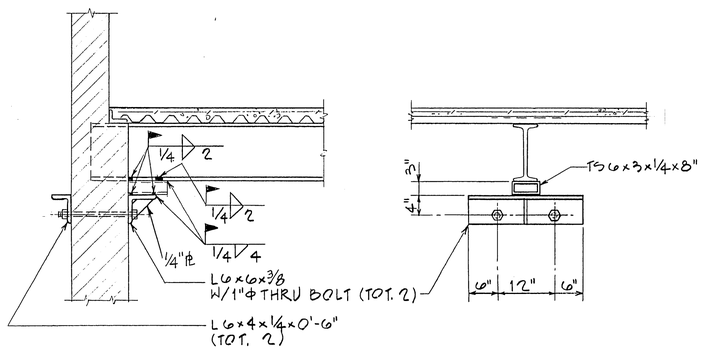
DRAWN BY R M EBY
SCALE AS SHOWN
DATE MAY 17,1988
DRAWING No. VG-1509
SHEET 5 OF 5

SD-167.1 10/87

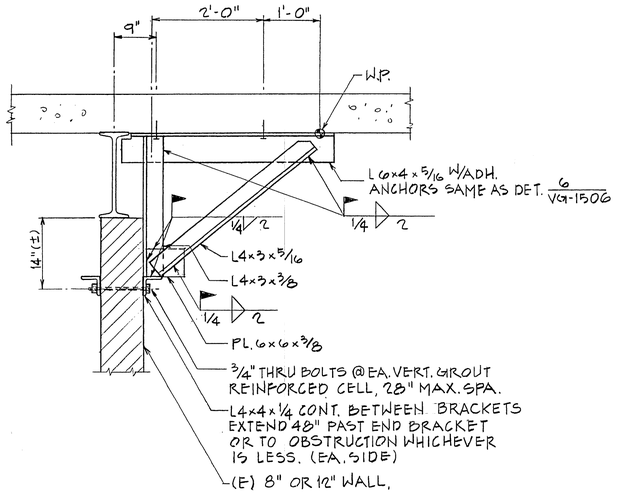


FOR PARTS NOT SHOWN
SEE DET. 1/VG-1506

DETAIL 1B / VG 1505

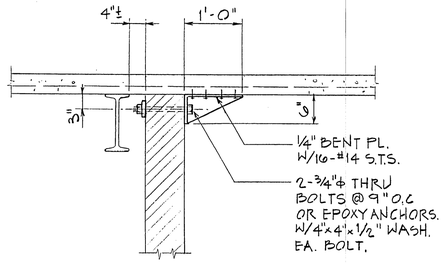


DETAIL 2-B / VG 1505



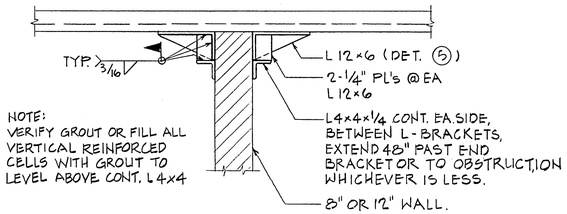
NOTE: VERIFY GROUT OR FILL ALL VERT. REINF. CELLS W/GROUT TO LEVEL ABOVE THRU. BOLT.

DETAIL 4-B / VG 1505



FOR PARTS NOT SHOWN
SEE DET. 5/VG-1506

DETAIL 5-A / VG 1505

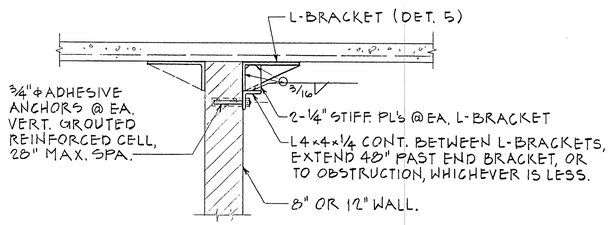


NOTE:
VERIFY GROUT OR FILL ALL VERTICAL REINFORCED CELLS WITH GROUT TO LEVEL ABOVE CONT. L4x4

FOR PARTS NOT SHOWN
SEE DET. 5/VG-1506

DETAIL 5-B / VG 1505

FOR DETAIL 3-B / VG-1505 ADD CONT. L4x4x1/4
SAME AS ABOVE



NOTE: VERIFY GROUT OR FILL ALL VERT. REINFORCED CELLS W/GROUT TO LEVEL ABOVE ADHESIVE ANCHORS.

DETAIL 5-C / VG 1505

NO.	DATE	REVISION	BY	REC.	APP.
	12DEC89	24MAR89 IN SERVICE; AS BUILT INSP. J.Farrell	RYE		

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JOB # 86042.02

DESIGNED BY
DESIGN CHECKED BY
DRAWN BY
SR. PROJ. ENGR.
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD

PROJECT ENG. R.P.E. No. C
PROJECT MGR. R.P.E. No. C
MGR. OF SUPPORT SERVICES R.P.E. No. C
MANAGER OF WASTEWATER R.P.E. NO. C

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

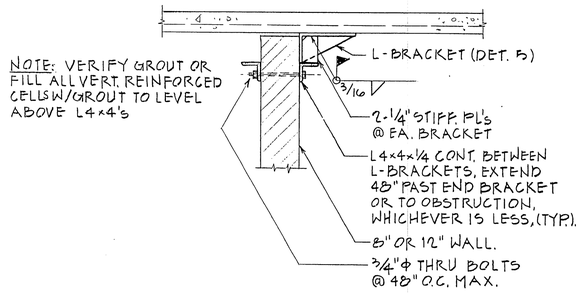
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 4

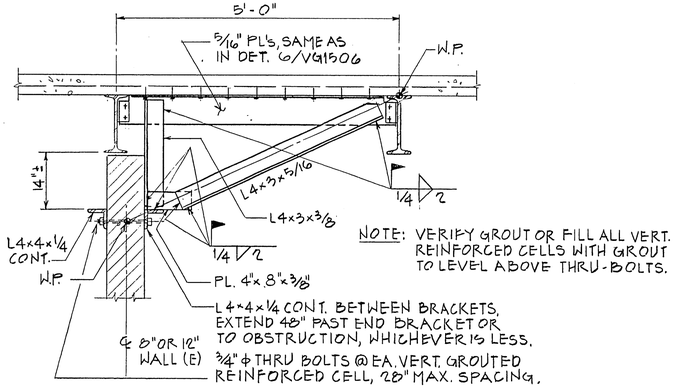
DRAWN BY G. OW-YANG
SCALE 3/4" = 1'-0"
DATE 11-27-1989
DRAWING No. VG-1511
SHEET OF

SD-167.1 10/87



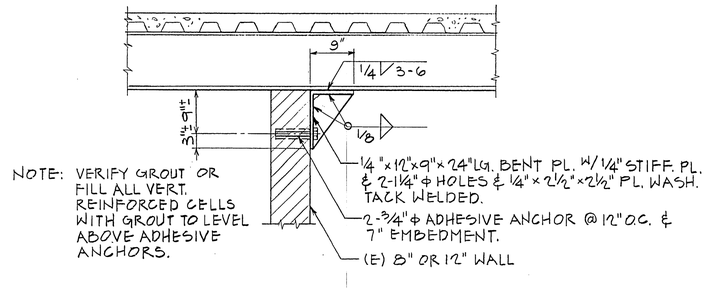
DETAIL 5-D
3/4" = 1'-0"
VG 1505

FOR PARTS NOT SHOWN SEE DET. 5/VG-1506

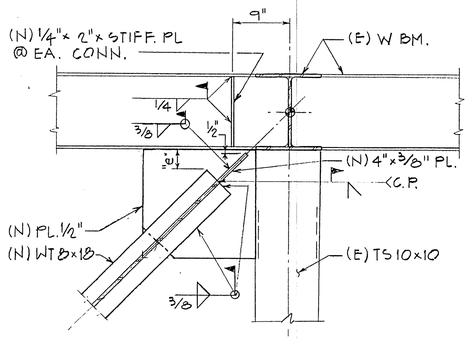


NOTE: VERIFY GROUT OR FILL ALL VERT. REINFORCED CELLS WITH GROUT TO LEVEL ABOVE THRU-BOLTS.

DETAIL 6-B
3/4" = 1'-0"
VG 1505



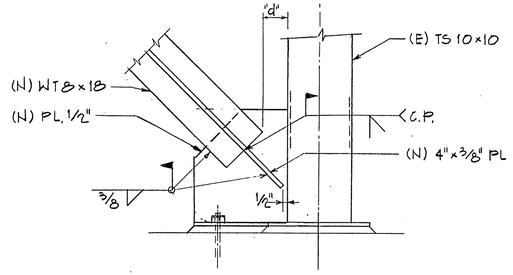
DETAIL 7-B
3/4" = 1'-0"
VG 1505



NOTE: ADD (N) 3/8" PL. WHEN "e" IS GREATER THAN 2".
ADD (N) 1/4" PL. STIFF. PL. @ CHANNEL AT ALL TOP CONNECTIONS - 4 TOTAL.

FOR PARTS NOTSHOWN SEE DET. 9/VG-1507

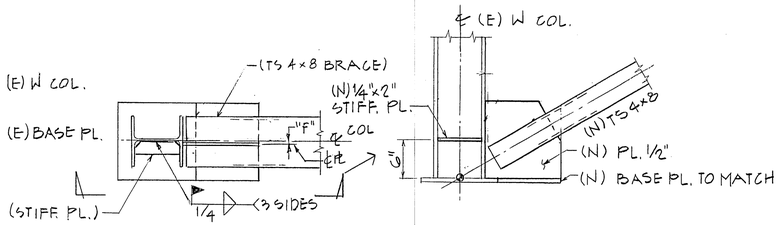
DETAIL 9-A
1" = 1'-0"
VG 1507



NOTE: ADD (N) PL. WHEN "d" IS GREAT THAN 2"

FOR PARTS NOT SHOWN SEE DET. 11/VG-1507

DETAIL 11-A
1" = 1'-0"
VG 1507



ADD NEW 1/4" STIFFENER PLATE WHEN "f" > 1/2"

FOR PARTS NOT SHOWN SEE DET. 16/VG-1508

DETAIL 16-A
1" = 1'-0"
VG-1508

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 — AS BUILT INSP. J.Farrell	RYE		

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EBMUD

PROJECT ENG. R.P.E. No. C	
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MANAGER OF WASTEWATER R.P.E. NO. C	

EAST BAY MUNICIPAL UTILITY DISTRICT
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ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 5

DRAWN BY G. Ow-Yang	DRAWING No. VG-1512
SCALE AS NOTED	
DATE 11-27-1989	SHEET OF

SD-167.1 10/87

NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE 1988 UNIFORM BUILDING CODE.
2. THESE NOTES SHALL APPLY TO ALL STRUCTURAL DRAWINGS UNLESS OTHERWISE NOTED OR SHOWN.
3. FEATURES OF CONSTRUCTION SHOWN ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT SIMILAR CONDITIONS.
4. UNLESS SHOWN OTHERWISE, DETAILS SHOWN ON "TYPICAL DETAIL" SHEETS SHALL BE USED WHEREVER APPLICABLE. SPECIFIC DETAILS ON THE STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER "TYPICAL DETAILS". SPECIFIC NOTES ON STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER NOTES SHOWN IN "GENERAL NOTES".
5. THE STRUCTURAL DRAWINGS SHOW STRUCTURAL FEATURES. CONFIGURATION OF INTERIOR PARTITION WALLS SHOWN ON STRUCTURAL DRAWINGS IS FOR GENERAL REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF PARTITIONS. PROVIDE ANCHORAGE INSERTS, ANCHOR BOLTS, ETC. FOR STRUCTURAL CONNECTIONS OF TOP, SIDES AND BOTTOM OF ALL PARTITION WALLS AS LOCATED ON THE ARCHITECTURAL DRAWINGS.
6. REFER TO THE ARCHITECTURAL DRAWINGS AND THE SPECIFICATIONS FOR THE FOLLOWING: FLOOR FINISHES; DEPRESSIONS AND CURBS ON FLOORS; OPENINGS REQUIRED FOR WINDOWS, DOORS, DUCTS, VENTS, PLUMBING, ETC.; FLASHING, INSERTS, ANCHORAGES; HANGERS ETC., EMBEDDED IN OR ATTACHED TO THE STRUCTURE; WALKS, PAVING, STAIRS, RAMPS, TERRACES, EXTERIOR GRADES, ELEVATIONS OF ROOF SURFACE AND LOCATIONS OF DRAINS AND PARTITION WALLS.
7. THE CONTRACTOR SHALL COMPARE THE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS AS TO ALL LAYOUTS, DIMENSIONS AND ELEVATIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER FOR PROPER ADJUSTMENT BEFORE PROCEEDING WITH THE WORK.
8. IN THE EVENT THAT CERTAIN FEATURES OF THE CONSTRUCTION ARE NOT FULLY SHOWN ON THE DRAWINGS OR CALLED FOR IN THE GENERAL NOTES OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS SHOWN FOR SIMILAR CONDITIONS.
9. BEAMS, PRECAST PLANKS, AND ANY OTHER STRUCTURAL ELEMENTS SHALL NOT BE CUT OR PENETRATED, EXCEPT AS SHOWN IN STRUCTURAL DETAILS OR AS APPROVED BY THE ENGINEER.
10. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO POURING CONCRETE. ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK
11. FEATURES OF EXISTING CONSTRUCTION SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD AND DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER.
12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADEQUATELY SHORE AND BRACE EXISTING BUILDING AS REQUIRED DURING CONSTRUCTION.

SYMBOLS AND ABBREVIATIONS

A-S2	INDICATES	SECTION A ON DRAWING S2, ETC.
AB	-	ANCHOR BOLT
C	-	CONTROL JOINT
CJ	-	CONSTRUCTION JOINT
CMU	-	CONCRETE MASONRY UNIT
CP	-	COMPLETE PENETRATION WELD
EB	-	EXPANSION BOLT
EF	-	EACH FACE
EW	-	EACH WAY
FCC	-	FACE OF CONCRETE
FCM	-	FACE OF MASONRY
FOS	-	FACE OF STEEL
FTG	-	FOOTING
GB	-	GRADE BEAM
HR	-	HARD ROCK
MECH	-	MECHANICAL
NTS	-	NOT TO SCALE
PDS	-	POWDER DRIVEN STUDS
SAD	-	SEE ARCHITECTURAL DRAWING OR SEE ARCHITECTURAL DETAIL
SIM	-	SIMILAR
SMD	-	SEE MECHANICAL DRAWINGS OR SEE MECHANICAL DETAILS
SMS	-	SHEET METAL SCREW
TCC	-	TOP OF CONCRETE
TOS	-	TOP OF STEEL
UON	-	UNLESS OTHERWISE NOTED
WWM	-	WELDED WIRE MESH
(E)	-	EXISTING
(N)	-	NEW

FOUNDATION NOTES
1. THE SOIL REPORT APPLICABLE TO THIS PROJECT SITE IS BY (GEO/RESOURCE CONSULTANTS, INC., REPORT #1618-00-0, DATED OCTOBER 15, 1990) AND IS AVAILABLE FOR REVIEW AT THE ENGINEER'S OFFICE. THE CONTRACTOR SHALL READ THE SOIL REPORT PREPARED FOR THIS PROJECT SITE AND SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK DESCRIBED THEREIN.
2. FOUNDATION SYSTEM IS A DRIVEN PILE AND GRADE BEAM SYSTEM. DRIVEN PILES DERIVE FRICTIONAL SUPPORT FROM FIRM CLAYEY SOIL UNDERLYING BAY MUD.
3. FOR BIDDING PURPOSES, THE PILE LENGTHS SHALL BE AS INDICATED ON THE FOUNDATION PLAN AND ON DETAILS. THESE LENGTHS ARE MINIMUM AND SHALL BE VERIFIED BY THE SOIL ENGINEER AFTER DRIVING OF INDICATOR PILES.
4. GRADE BEAMS SHALL BE CENTERED ON GRID LINES UNLESS OTHERWISE NOTED.
5. SEE ARCHITECTURAL, PLUMBING, MECHANICAL, ELECTRICAL AND ANY OTHER INCLUDED DRAWINGS, AND CONSULT WITH THE RESPECTIVE TRADES FOR VERIFICATION OF ALL ITEMS SHOWN OR NOT SHOWN ON STRUCTURAL PLANS PRIOR TO POURING CONCRETE GRADE BEAMS, FOOTINGS AND FLOOR SLABS.
6. VERIFY LOCATIONS FOR OPENINGS OR PENETRATIONS THROUGH CONCRETE, CONCRETE CURBS, FLOOR DEPRESSIONS, FLOOR SLOPES AND DRAINS, INSERTS, ETC.

CONCRETE NOTES
1. ALL CONCRETE SHALL BE REINFORCED UNLESS NOTED "NOT REINFORCED".
2. SEE SPECIFICATIONS FOR THE REQUIREMENTS IN THE PRODUCTION, TESTING AND INSTALLATION OF CONCRETE.
3. SEE ARCHITECTURAL DRAWINGS FOR LOCATION AND EXTENT OF EXTERIOR WALKS AND PAVEMENTS AND FOR REINFORCEMENT REQUIREMENTS.
4. REINFORCEMENT SHALL BE PER ASTM A615-60, WITH BAR MARKS LEGIBLY ROLLED INTO THE SURFACE INDICATING SIZE, TYPE OF STEEL, AND YIELD STRENGTH DESIGNATION.
5. SEE SPECIFICATIONS FOR REQUIRED CONCRETE STRENGTHS.
6. LAP ALL REINFORCING BARS 40 BAR DIAMETERS AT SPLICES. STAGGER SPLICES WHEREVER POSSIBLE. VERTICAL WALL REINFORCING BARS SHALL EXTEND INTO FOOTINGS, BUT MAY BE DOWELLED WITH 40 BAR DIAMETER LAPS OF SAME SIZE BARS.
7. REINFORCEMENT, ANCHOR BOLTS, PIPE SLEEVES, AND OTHER INSERTS SHALL BE POSITIVELY SECURED IN PLACE BEFORE CONCRETE IS POURED.
8. REINFORCING BARS WELDED TO STRUCTURAL STEEL SHALL BE SUPPLIED BY REINFORCING BAR SUB-CONTRACTOR AND ALL WELDING SHALL BE DONE BY STRUCTURAL STEEL SUB-CONTRACTOR.
9. BAR COVERAGE TO FACE OF BAR, EXCEPT AS OTHERWISE SHOWN, SHALL BE:
   - 3" WHERE CONCRETE IS POURED AGAINST EARTH OR AGAINST GROUND CONTACT.
   - 2" FOR BARS LARGER THAN #5, WHERE CONCRETE SURFACES ARE EXPOSED TO EARTH OR TO WEATHER AFTER REMOVAL OF FORMS.
   - 1-1/2" FOR #5 BARS OR SMALLER, WHERE CONCRETE SURFACES ARE EXPOSED TO EARTH TO WEATHER AFTER REMOVAL OF FORMS.
10. INTERIOR SLABS ON GROUND SHALL BE REINFORCED AS SHOWN ON STRUCTURAL PLANS. LOCATIONS OF CONSTRUCTION JOINTS OTHER THAN SHOWN ON DRAWINGS MUST BE APPROVED BY THE ENGINEER.
11. ALL CONCRETE CURBS ARE 4 INCHES HIGH UNLESS OTHERWISE NOTED.
12. THE SURFACE OF ALL CONSTRUCTION JOINTS SHALL BE CLEANED AND ROUGHENED BY REMOVING THE ENTIRE SURFACE AND EXPOSING CLEAN AGGREGATE SOLIDLY EMBEDDED IN MORTAR MATRIX.

EXISTING CONCRETE NOTES
1. WHERE NEW CONSTRUCTION IS INTEGRATED WITH EXISTING CONCRETE CONSTRUCTION, CARE SHALL BE TAKEN SO AS NOT TO DAMAGE EXISTING REMAINING CONCRETE AND REINFORCING. WHERE NEW CONCRETE ABUTS EXISTING CONCRETE ROUGHEN EXISTING CONCRETE SURFACE SO AS TO EXPOSE SOLID MORTAR MATRIX WITH 1/4" MINIMUM AMPLITUDE TYPICAL. APPLY APPROVED BONDING AGENT TO SURFACE OF EXISTING CONCRETE.
2. HOLES FOR GROUTED ANCHORS SHALL BE DRILLED WITH ROTARY HAMMER OR OTHER SUITABLE METHODS TO ENSURE EXISTING REINFORCEMENT IS NOT DAMAGED. HOLE DIAMETER SHALL BE 1/8" GREATER THAN ANCHOR ROD DIAMETER, UNLESS OTHERWISE NOTED. GROUT SHALL BE NON-SHRINK AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI. LOCATE EXISTING REINFORCING BARS PRIOR TO DRILLING HOLES. DO NOT DAMAGE EXISTING REINFORCING. METHOD OF LOCATING REINFORCING BARS SHALL BE APPROVED BY THE ENGINEER. ALL MIS-DRILLED OR UNACCEPTABLE HOLES HOLES SHALL BE GROUTED SOLID.

PRECAST PLANK NOTES
1. SEE SPECIFICATIONS FOR MINIMUM CONCRETE STRENGTH, REINFORCING REQUIREMENTS, ERECTION NOTES AND SHOP DRAWING SUBMITTAL REQUIREMENTS.
2. PLANKS SHALL BE DESIGNED BY A CIVIL ENGINEER REGISTERED IN CALIFORNIA. SUPERIMPOSED LOADS (PSF) FOR DESIGN SHALL BE AS FOLLOWS:

	DEAD LOAD	LIVE LOAD	TOTAL LOAD
TYPICAL LOADING	65.0**	50.0	115.0
CORRIDOR **	45.0**	100.0	145.0
STORAGE (TYPICAL)	65.0	125.0	190.0
STORE ROOM (SEE SHEET S2.4)	45.0	400.0	445.0
FIELD SERVICES (OPEN BAY)	65.0**	50.0*	115.0

* DESIGN FOR 500 PSF LIVE LOAD OR 2000 POUND CONCENTRATED AT ANY POINT, WHICHEVER PRODUCES GREATER STRESSES.
** NOTE ADDITIONAL CONCRETE FILL AT TEMPORARY SAMPLE HOLDING AND AT DEPRESSED PLANKS ADJACENT TO RESTROOMS, LOCKER ROOMS, COLD ROOM AND FLOOR DRAIN IN FIELD SERVICES OPEN BAY.

3. CORE DRILL OPENINGS THROUGH NEW OR EXISTING PRECAST PLANKS WHERE SHOWN ON MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS. SEE SPECIFICATIONS FOR PROCEDURE.

STRUCTURAL STEEL NOTES
1. ALL STRUCTURAL STEEL SHALL BE ASTM A36. ALL STRUCTURAL TUBING SHALL BE ASTM A500 GRADE B. ALL STEEL PIPE COLUMNS SHALL BE GRADE B PIPE, ASTM A53. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS, LATEST EDITION.
2. ALL BOLTED CONNECTIONS STEEL TO STEEL SHALL BE MADE WITH 3/4" DIAMETER HIGH-STRENGTH (A325F) BOLTS UNLESS OTHERWISE NOTED.
3. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.
4. ALL TESTING AND INSPECTION OF SHOP AND FIELD WELDING OPERATIONS SHALL BE MADE BY A CERTIFIED WELDING INSPECTOR.
5. ALL WELDS SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS, THE UNIFORM BUILDING CODE AND AWS D1.1. THE WELDING INSPECTOR SHALL CHECK THE MATERIAL, EQUIPMENT, FIT UP AND PROCEDURES AS WELL AS THE WELDS. THE INSPECTOR SHALL USE ALL MEANS NECESSARY TO DETERMINE THE QUALITY OF THE WELDS, INCLUDING THE USE OF GAMMA RAY, MAGNAFLUX, TREPANNING, SONICS OR ANY OTHER AID TO VISUALLY INSPECT AND TO ASCERTAIN THE ADEQUACY OF THE WELDING. THE INSPECTOR SHALL FURNISH THE DISTRICT WITH A REPORT VERIFYING THAT ALL WELDS HAVE BEEN DONE IN CONFORMITY WITH THE PLANS, SPECIFICATIONS, AWS D1.1 AND ANY APPLICABLE CODES. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE FABRICATION AND ERECTION REQUIREMENTS MAY DICTATE FIELD WELDING AND/OR SHOP WELDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE METHOD OF WELDING TO FULFILL THESE REQUIREMENTS. ALL ASSOCIATED COSTS SHALL BE INCLUDED IN THE CONTRACT PRICE.
6. WHERE CLOSER THAN AISC TOLERANCES ARE NECESSARY, SUCH AS FOR ALIGNMENT OF STEEL STUDS, MULLIONS, ETC., FIELD WELDING WILL BE REQUIRED TO MEET THE NECESSARY TOLERANCES WITH NO ADDITIONAL COSTS TO THE DISTRICT.
7. WELDING OF REBAR TO STRUCTURAL STEEL SHALL BE DONE BY STRUCTURAL STEEL SUB-CONTRACTOR.
8. BOLT HOLES IN STEEL SHALL BE 1/16" OVERSIZE UNLESS OTHERWISE NOTED.
9. STRUCTURAL STEEL SUB-CONTRACTOR SHALL EXCHANGE SHOP DRAWINGS WITH STEEL DECK SUB-CONTRACTOR FOR COORDINATION.

STEEL DECKING NOTES
1. SEE STRUCTURAL DETAILS FOR TYPE OF STEEL DECKING REQUIRED FOR THIS PROJECT.
2. STEEL DECKING PANEL UNITS SHALL BE FORMED FROM ZINC COATED STEEL SHEETS WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI. ZINC COATING SHALL BE G60 AND 0.5 OUNCE MINIMUM PER SQUARE FOOT OF STEEL SHEET.
3. SECTION PROPERTIES SHALL CONFORM TO THE AISI SPECIFICATIONS FOR THE DESIGN OF LIGHT GAGE COLD FORMED STEEL STRUCTURAL MEMBERS.
4. DECK PANELS SHALL SPAN OVER THREE OF MORE SUPPORTS WHERE STRUCTURAL FRAMING PERMITS AND AS SHOWN ON STRUCTURAL PLANS AND DETAILS AND SHALL INCLUDE ALL ACCESSORIES FOR THIS TYPE OF DECKING SUCH AS CLOSURES, FLASHING, COVER CAPS, ETC. PANELS SHALL BE ALIGNED AND PLACED IN ACCORDANCE WITH THE MANUFACTURER'S APPROVED STANDARD DETAILS AND SHOP DRAWINGS.
5. WELDING OF STEEL DECK PANELS TO SUPPORTING STRUCTURAL FRAMING AS NOTED ON STRUCTURAL DETAILS AND/OR AS CALLED FOR ON APPROVED SHOP DRAWINGS SHALL BE DONE BY CERTIFIED WELDERS.
6. PRIOR TO APPLICATION OF CONCRETE, THE STEEL DECKING SHALL BE CLEANED OF ALL DIRT, DEBRIS, OIL, WATER OR ANY OTHER FOREIGN MATERIAL.
7. CONCRETE FILL ON STEEL DECKING SHALL TEST NOT LESS THAN 3000 PSI AT 28 DAYS, AND SHALL BE REINFORCED WITH #3 @ 12" O.C. E.W. PLACED AT THE CENTER OF THE CONCRETE FILL.
8. STEEL DECKING SUB-CONTRACTOR SHALL EXCHANGE SHOP DRAWINGS WITH STRUCTURAL STEEL SUB-CONTRACTOR FOR COORDINATION.
9. SHEAR CONNECTOR DETAILS AND TESTING SHALL BE IN ACCORDANCE WITH TYPICAL DETAILS.

LIGHT GAGE STEEL FRAMING NOTES
1. METAL STUD FABRICATION SHALL CONFORM TO AISI SPECIFICATIONS FOR THE DESIGN OF LIGHT GAGE COLD FORMED SECTIONS.
2. ALL GALVANIZED STUDS (AND/OR) JOISTS, 12, 14 AND 16 GAGE, SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A446, GRADE D, WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI.
3. ALL GALVANIZED 18 AND 20 GAGE STUDS (AND/OR) JOISTS, AND ALL GALVANIZED TRACK, BRIDGING AND ACCESSORIES SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A446, GRADE A, WITH OF MINIMUM YIELD STRENGTH OF 33,000 PSI.
4. METAL STUDS SHALL BE AT 16" O.C. MAXIMUM. SEE SPECIFICATIONS FOR REQUIRED MINIMUM SECTION PROPERTIES.
5. ALL WELDS FOR LIGHT GAGE STEEL SHALL BE IN ACCORDANCE WITH AISC AND AISI SPECIFICATIONS.
6. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.
7. ALL WELDS SHALL BE INSPECTED BE A CERTIFIED WELDING INSPECTOR.
8. BEARING STUDS SHALL BE INSTALLED IN A MANNER WHICH WILL ASSURE THAT ENDS OF THE STUDS ARE POSITIONED AGAINST THE TRACK WEBS, PRIOR TO STUD AND TRACK ATTACHMENT.
9. STUDS SHALL BE SEATED SQUARELY IN THE TRACK WITH THE STUD WEB AND FLANGE ABUTTING THE TRACK WEB, PLUMBED AND ALIGNED, AND SECURELY ATTACHED TO THE FLANGES OR WEB OF BOTH THE UPPER AND LOWER TRACKS.
10. WALL STUD BRIDGING SHALL BE ATTACHED IN A MANNER TO PROVIDE RESISTANCE TO BOTH MINOR AXIS BENDING AND ROTATION, BRIDGING ROWS SHALL BE EQUALLY SPACED NOT TO EXCEED 3'-4" O.C.
11. SPLICES IN STUDS SHALL NOT BE PERMITTED.
12. JOISTS SHALL BE LOCATED DIRECTLY OVER BEARING STUDS UNLESS OTHERWISE DETAILED.
13. JOIST BRIDGING SHALL BE PROVIDED AS SHOWN ON PLANS AND AS RECOMMENDED BY THE STEEL JOIST INSTITUTE.
14. END BLOCKING SHALL BE PROVIDED WHERE JOIST ENDS ARE NOT OTHERWISE RESTRAINED FROM ROTATION.
15. TEMPORARY BRACING SHALL BE PROVIDED UNTIL ERECTION IS COMPLETE.
16. FRAMED WALL OPENINGS SHALL INCLUDE HEADERS AND SUPPORTING STUDS, AS SHOWN ON TYPICAL FRAMING DETAILS PROVIDED BY MANUFACTURER UNLESS OTHERWISE NOTED.

EXPANSION ANCHORS IN HARDENED CONCRETE OR CONCRETE MASONRY UNIT NOTES
1. INSTALLATION: THE ANCHORS MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN THE MANUFACTURER'S COMMITTEE RECOMMENDATIONS FOR THE SPECIFIC ANCHOR.
2. JOB TESTING: 50% OF THE ANCHORS SHALL BE TENSION PROOF LOAD TESTED TO TWICE THE ANCHORS ALLOWABLE TENSION LOAD. IF ANY ANCHOR FAILS, THEN ALL ANCHORS MUST BE TESTED. THE LOAD TEST SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. THE LOAD MAY BE APPLIED BY ANY METHOD THAT WILL EFFECTIVELY MEASURE THE TENSION IN THE ANCHOR, SUCH AS DIRECT PULL WITH A HYDRAULIC JACK, A TORQUE WRENCH CALIBRATED USING THE SPECIFIC ANCHOR, CALIBRATED SPRING-LOADED DEVICES, ETC. ANCHORS IN WHICH THE TORQUE IS USED TO EXPAND THE ANCHOR WITHOUT APPLYING TENSION TO THE BOLT MAY NOT BE VERIFIED WITH A TORQUE WRENCH.
3. ALL EXPANSION ANCHORS SHALL BE PHILLIPS RED HEAD WEDGE ANCHORS (W.A.), HILTI HSL HEAVY DUTY ANCHOR OR APPROVED EQUAL.
4. TEST INSPECTOR SHALL VERIFY ALL EXPANSION ANCHORS NOT TENSION LOAD TESTED FOR MINIMUM INSTALLATION TORQUE NOTED IN SCHEDULE BELOW.
5. TENSION PROOF LOAD SHALL BE BY AN INDEPENDENT TESTING LABORATORY.
6. EXPANSION ANCHOR BOLT SCHEDULE:

NORMAL WEIGHT CONCRETE WITH f'c = 3000 psi

ANCHOR DIAMETER	MINIMUM EMBEDMENT	MINIMUM INSTALLATION TORQUE (FT-LBS.)
1/4"	2"	5
3/8"	3"	20
1/2"	4"	40
5/8"	5"	70
3/4"	6"	125

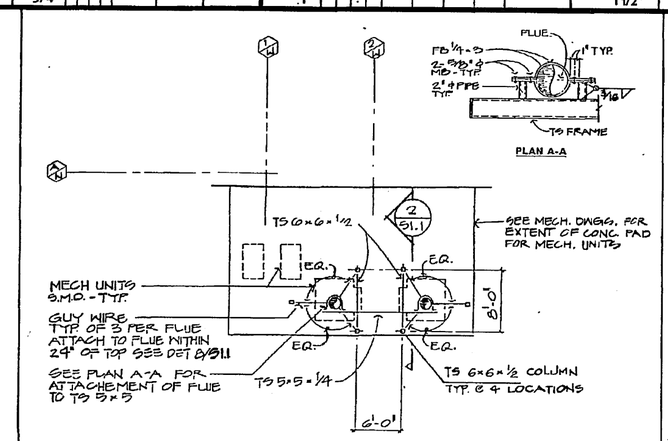
CONCRETE MASONRY UNIT WITH f'm = 1500 psi

ANCHOR DIAMETER	MINIMUM EMBEDMENT	MINIMUM INSTALLATION TORQUE (FT-LBS.)
1/4"	2"	5
3/8"	3"	20
1/2"	4"	40
5/8"	5"	70
3/4"	6"	125

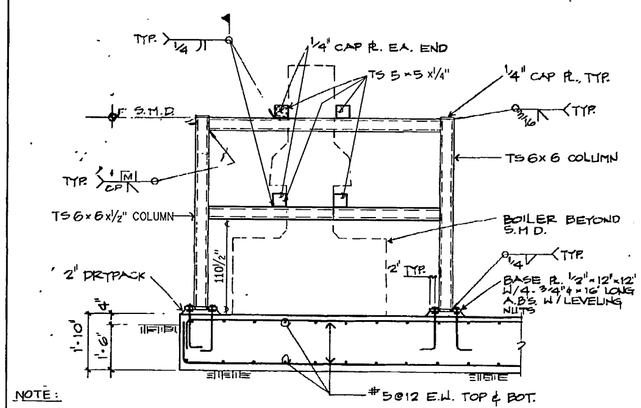
TEST AND INSPECTION NOTES
1. TESTS AND INSPECTIONS SHALL BE PROVIDED FOR ALL ITEMS AS REQUIRED BY THE UNIFORM BUILDING CODE.
2. THE DISTRICT SHALL BE RESPONSIBLE FOR RETAINING AN INDEPENDENT TESTING AND INSPECTION LABORATORY TO PERFORM ALL REQUIRED TESTING AND INSPECTIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE TESTING AND INSPECTION LABORATORY WITH CONSTRUCTION SCHEDULES TO ENSURE PROPER COORDINATION OF WORK.
4. THE FOLLOWING SPECIFIED ITEMS SHALL BE INSPECTED BY AN APPROVED TESTING AND INSPECTION LABORATORY:
   - A. PRESTRESSING STEEL IN PILES AND PRECAST PLANKS.
   - B. PILE DRIVING OPERATIONS (CONTINUOUS INSPECTION BY SOIL ENGINEER)
   - C. REINFORCING STEEL
   - D. CONCRETE PLACEMENT
   - E. ALL STRUCTURAL WELDING
   - F. EXPANSION BOLTS (SEE NOTES ABOVE)
5. THE DISTRICT SHALL RETAIN AN INDEPENDENT TESTING AND INSPECTION LABORATORY TO PERFORM TESTING OF ALL STRUCTURAL CONCRETE.
6. THE CONTRACTOR SHALL NOTIFY THE INSPECTOR A MINIMUM OF 48 HOURS PRIOR TO THE TIME OF A REQUIRED INSPECTION.

LEGEND

	DENOTES	EARTH
	-	EXISTING CONCRETE MASONRY IN PLAN
	-	EXISTING CONCRETE MASONRY TO BE REMOVED
	-	EXISTING CONCRETE IN SECTION
	-	NEW CONCRETE IN SECTION
	-	STRUCTURAL STEEL IN SECTION

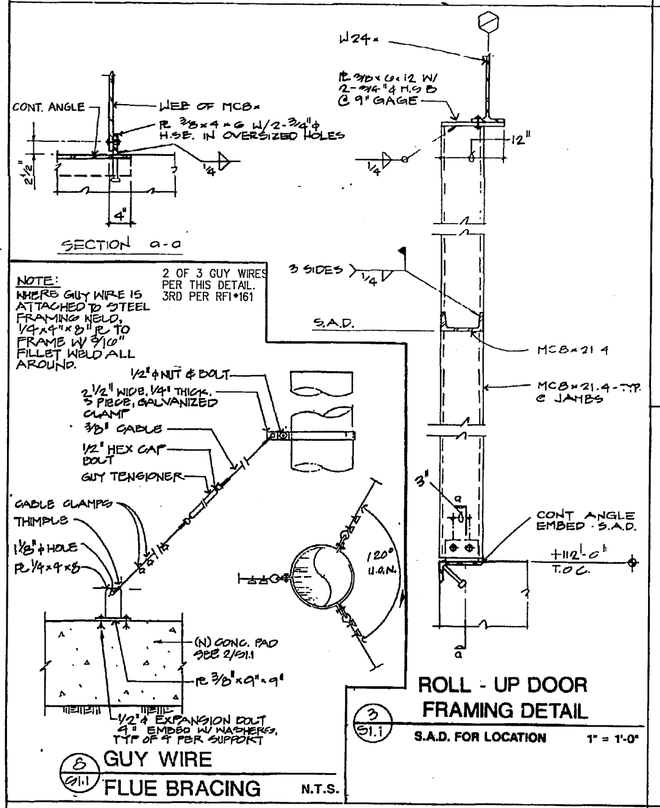


1 S1.1 BOILER FLUE BRACING - PLAN 1/8" = 1'-0"



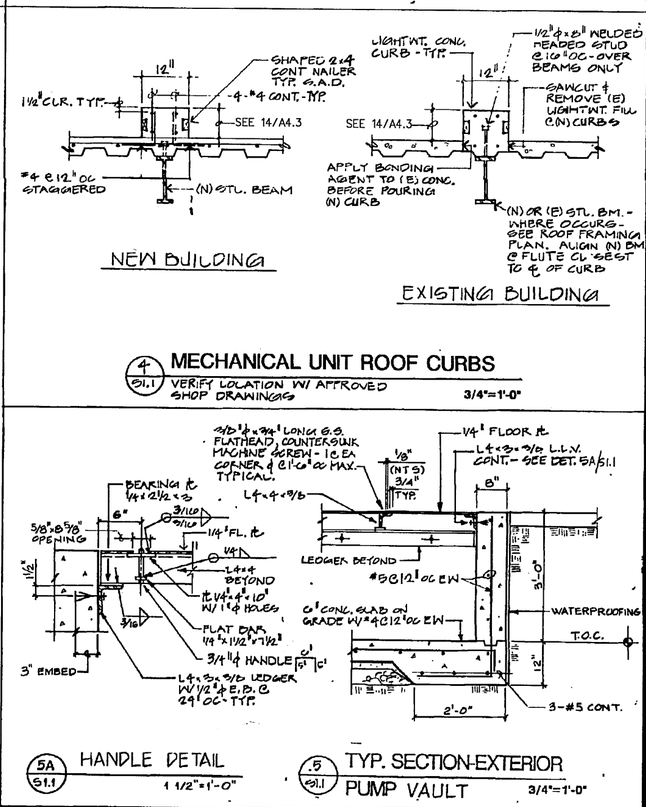
NOTE: USE SAME PAD THICKNESS & REINF. AT PAD FOR ELECTRICAL GENERATOR

2 S1.1 BOILER FLUE BRACING 1/2" = 1'-0"



5 S1.1 ROLL - UP DOOR FRAMING DETAIL
S.A.D. FOR LOCATION 1" = 1'-0"

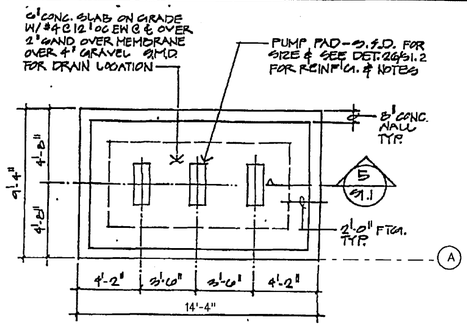
8 S1.1 GUY WIRE FLUE BRACING N.T.S.



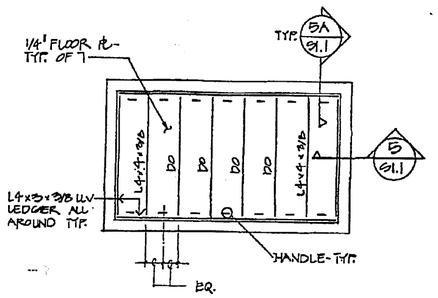
4 S1.1 MECHANICAL UNIT ROOF CURBS
VERIFY LOCATION W/ APPROVED SHOP DRAWINGS 3/4"=1'-0"

5A S1.1 HANDLE DETAIL 1 1/2"=1'-0"

5 S1.1 TYP. SECTION-EXTERIOR PUMP VAULT 3/4"=1'-0"



6 S1.1 EXTERIOR PUMP VAULT FOUNDATION PLAN 1/4"=1'-0"



7 S1.1 EXTERIOR PUMP VAULT ROOF FRAMING PLAN 1/4"=1'-0"

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PLANNING
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URBAN DESIGN
INTERIORS
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EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

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EBMUD PROJECT MGR. R.P.E. NO. C 31969
EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
A	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM 4
	9/28/93 11/24/93	PHASE 1 AS BUILTS NOV. AS BUILTS
	1-17-96	AS NOTED 28 AUG 94 AS BUILT RSP. PYL

Date 7/29/91

Sheet Title
General Notes
Miscellaneous Details

Project No 9002

S1.1 | 0

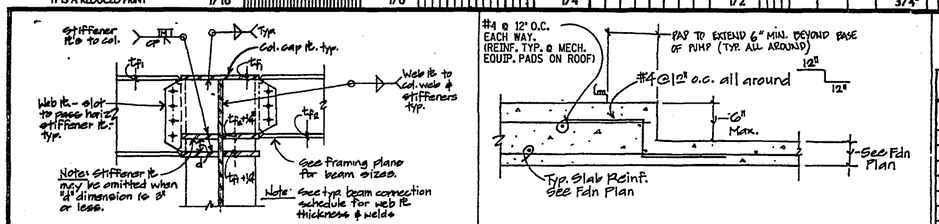
Sheet No. 84/178 | Revision

8K 9/3/97 MW

USER: RGA
DATE: 1-17-96
FILE: /USR2/SD185/STRUCT/S1.1.DGN

DIETZGEN POST REORDER NO 190257

NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT



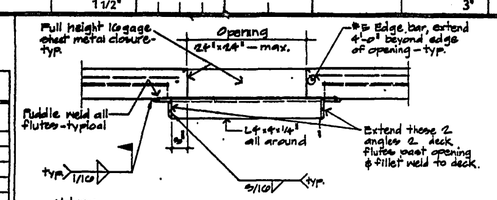
1 / 21.2 BEAM-TO-COLUMN WEB MOMENT CONNECTION (BEAMS OPPOSITE OF DIFFERENT SIZES)

2 / 21.2 MECHANICAL EQUIPMENT PAD ON GRADE

BEAM CONNECTION SCHEDULE

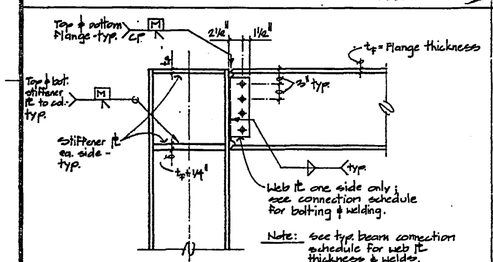
Beam Depth	No. 3/4" ϕ A325F H.S. bolts	Web Plate Thickness	Web Plate Weld
W18, W10, C10	2	1/4"	5/16"
W12, W14, C12	3	1/4"	5/16"
W16, W18	4	5/8"	5/16"
W21	5	5/8"	5/16"
W24	6	1/2"	5/16"
W27	7	1/2"	5/16"

11 / 21.1 TYPICAL BEAM CONNECTION SCHEDULE

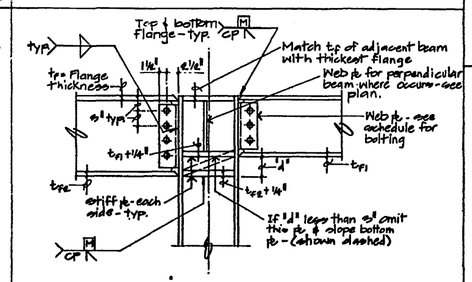


Notes:
1. See Arch., Mech., Elec. & Plumbing drawings for openings not shown on structural drawings.
2. Provide steel beams on all sides of openings exceeding 24" in either direction.

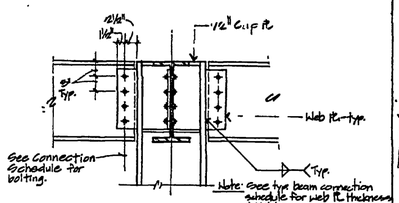
28 / 21.2 TYPICAL OPENING IN METAL DECK



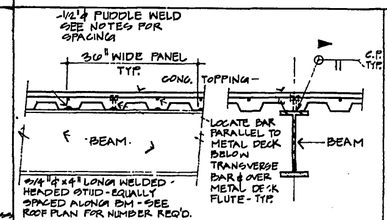
3 / 21.2 BEAM-TO-COLUMN FLANGE MOMENT CONNECTION (Beam one side)

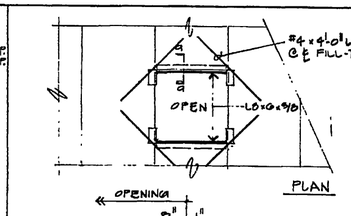


6 / 21.2 BEAM-TO-COLUMN FLANGE MOMENT CONNECTION (beam 2 sides)

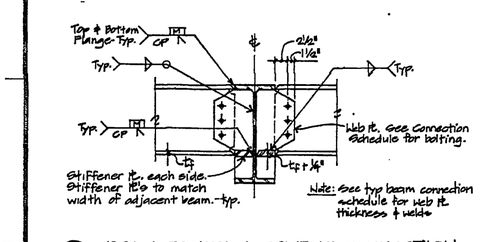


12 / 21.2 BEAM-TO-COLUMN FLANGE

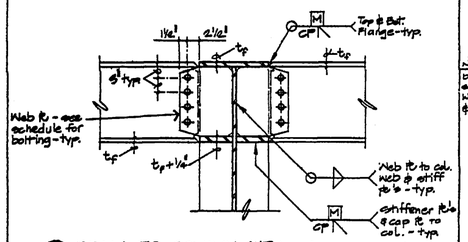




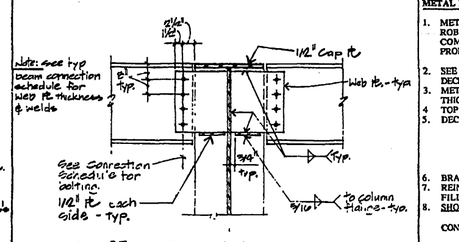
21 / 21.2 TYPICAL OPENING THROUGH PRE-CAST PLANKS



5 / 21.2 BEAM-TO-BEAM MOMENT CONNECTION



7 / 21.2 BEAM-TO-COLUMN WEB MOMENT CONNECTION (Beams opposite same size)

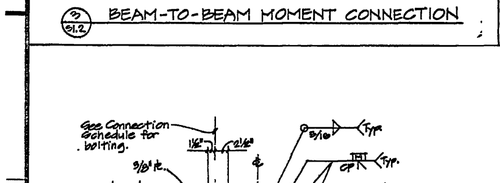


8 / 21.2 BEAM-TO-COLUMN WEB

METAL DECK NOTES

1. METAL DECK TO RECEIVE CONCRETE FILL SHALL BE 2"-QL-99-18 GAGE BY H.H. ROBERTSON COMPANY OR W.3 x 18 GAGE "FORMLOCK" BY VERCO MANUFACTURING COMPANY OR APPROVED EQUAL WITH THE FOLLOWING MINIMUM SECTION PROPERTIES: $I_x = 1.221$ in.4, $S_x = 0.567$ in.3
2. SEE GENERAL NOTES, TYPICAL DETAILS AND SPECIFICATIONS FOR ADDITIONAL METAL DECK NOTES.
3. METAL DECK SHALL NOT LAP AT SUPPORTS SO WELDING SHALL GO THROUGH ONE THICKNESS OF DECK ONLY.
4. TOP FLANGE OF ALL STEEL BEAMS AND LEDGERS SHALL BE UNPAINTED FOR WELDING.
5. DECK WELDING: AT ENDS OF PANEL AND AT INTERMEDIATE TRANSVERSE SUPPORTS 3-1/2" DIAMETER PUDDLE WELDS PER 36" WIDE PANEL.
   AT PERIMETER OF PANEL AND INTERMEDIATE PARALLEL SUPPORTS 1/2" DIAMETER PUDDLE WELDS AT 18" ON CENTER
   SEAM ATTACHMENT: 1-1/2" LONG SEAM WELD AT 3'-0" ON CENTER.
6. BRACE CONTINUOUS CLOSURE PIECES WITH METAL STRAPS AT 6'-0" ON CENTER.
7. REINFORCE CONCRETE FILL WITH #3 AT 12" ON CENTER EACH WAY AT CENTERLINE OF FILL.
8. SHORING IS REQUIRED AT ALL 2-SPAN CONDITIONS WHERE EITHER SPAN EXCEEDS 9'-6". CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SHORING IF THIS CONDITION OCCURS.

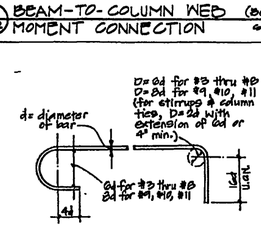
17 / 21.2 METAL DECK TYPICAL DETAIL



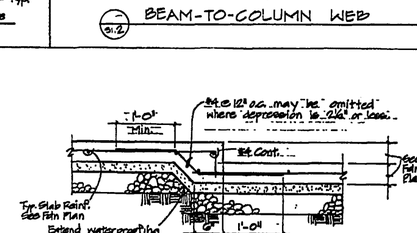
Column Base Plate & Anchor Bolt Schedule

Type	Base Plate Size: Thickness	Width (W)	Length (L)	Anchor Bolts
W12 col.	1"	14"	20"	4-3/4"ϕ x 10'-0" LONG
W14 col.	1"	20"	24"	4-3/4"ϕ x 10'-0" LONG

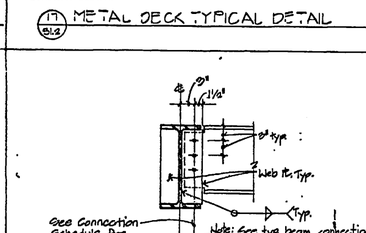
5 / 21.2 BASE PLATE & ANCHOR BOLT DETAIL
SEE DET. 6/S3.2 & 12/S3.2 FOR BASE PLATE @ CORNER COLUMNS



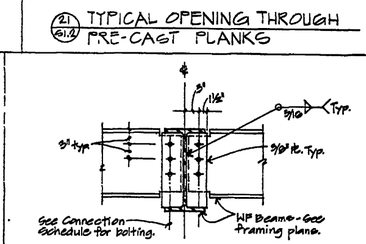
8 / 21.2 TYP. REINFORCING BAR & ANCHOR BOLT HOOKS



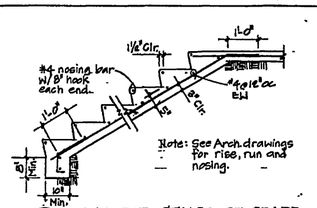
14 / 21.2 DEPRESSED SLAB ON GRADE



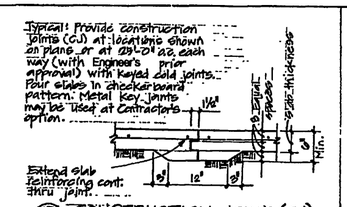
16 / 21.2 BEAM-TO-BEAM CONNECTION Beam One Side Only



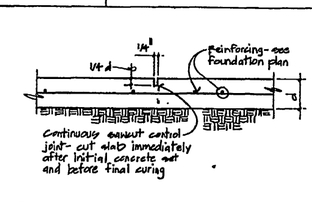
22 / 21.2 BEAM-TO-BEAM CONNECTION Beam Both Sides



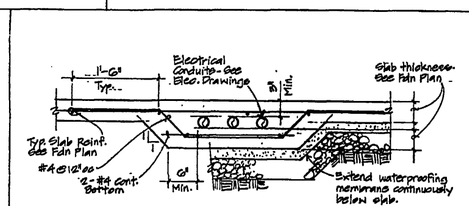
9 / 21.2 CONCRETE STAIRS ON GRADE



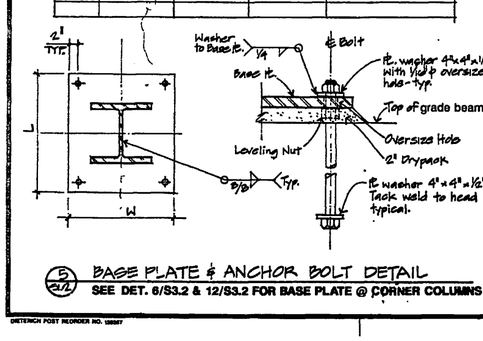
15 / 21.2 CONSTRUCTION JOINT (CJ) CONCRETE SLAB ON GRADE



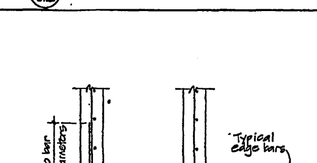
19 / 21.2 CONTROL JOINT (C) CONCRETE SLAB ON GRADE



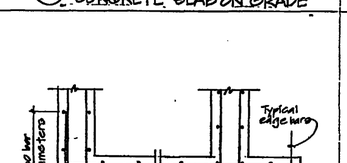
23 / 21.2 CONDUIT PENETRATION IN SLAB ON GRADE



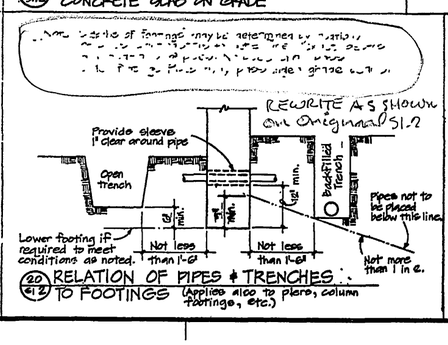
5 / 21.2 BASE PLATE & ANCHOR BOLT DETAIL
SEE DET. 6/S3.2 & 12/S3.2 FOR BASE PLATE @ CORNER COLUMNS



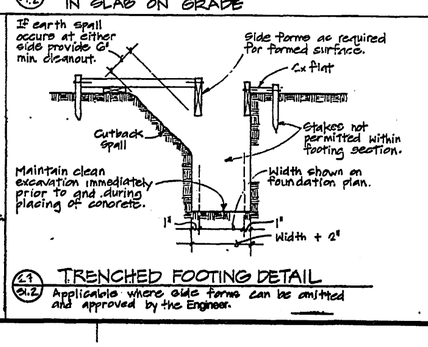
10 / 21.2 TYP. REINFORCEMENT AT WALL & FOOTING CORNERS



10a / 21.2 TYP. REINFORCEMENT AT WALL & FOOTING CORNERS



20 / 21.2 RELATION OF PIPES & TRENCHES TO FOOTINGS (Applies also to piers, column footings, etc.)



21.1 / 21.2 TRENCHED FOOTING DETAIL
Applicable where side forms can be omitted and approved by the Engineer.

USER: ROW
DATE: 7-31-95
FILE: I/usr2/aby/sd185/s1.2.dgn

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R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER
R.P.E. NO. C 30978

Issuances and Revisions

No.	Date	Description
2	1/23/92	ISSUE FOR CONSTRUCTION ADDENDUM 4
1	7-31-95	AS BUILT 1994 AS BUILT PER PYL

Date 7/29/91

Sheet Title
Typical Details

Scale: None

Project No. 9002

S1.2 | 0

Sheet No. 85/178 | Revision

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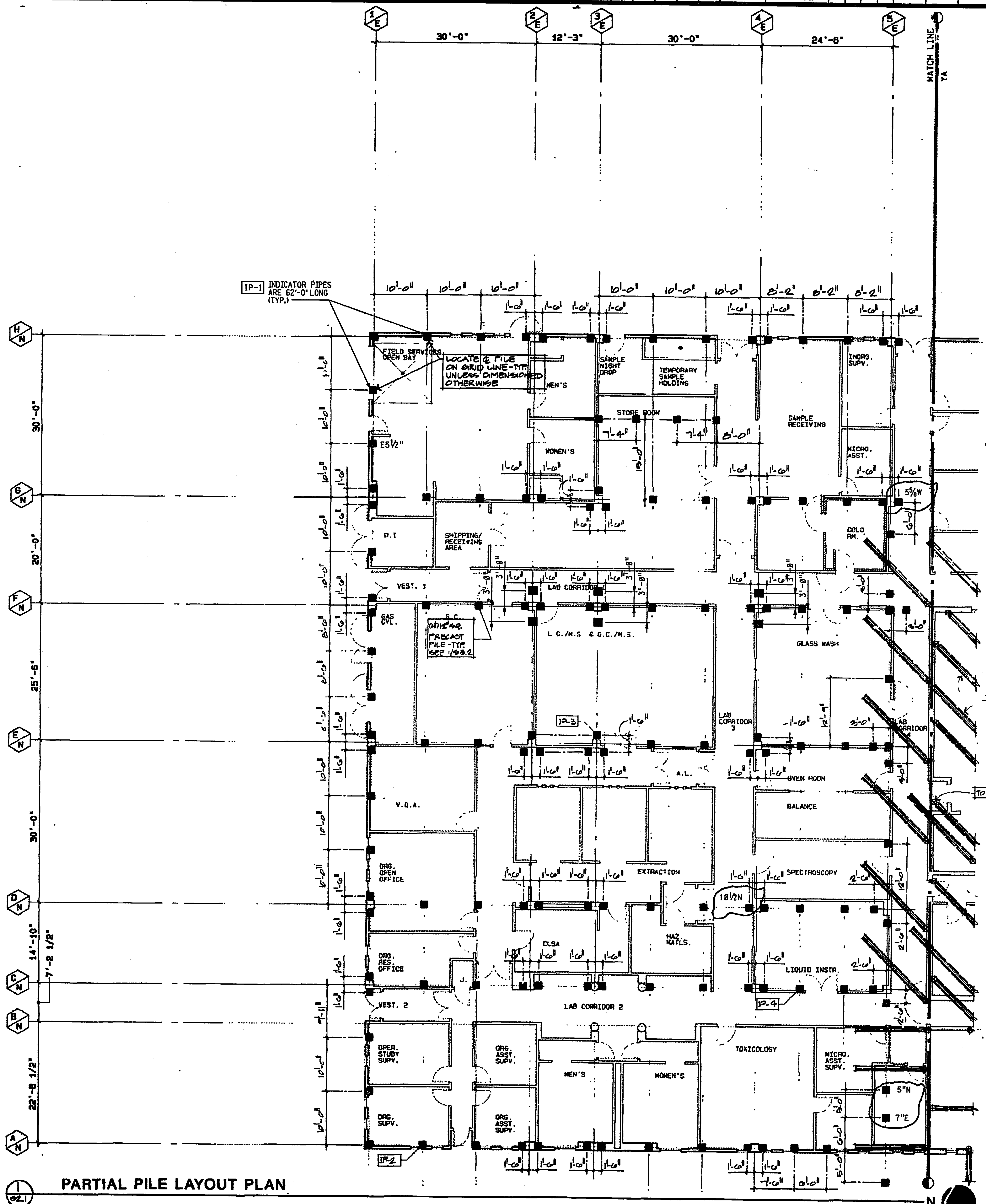
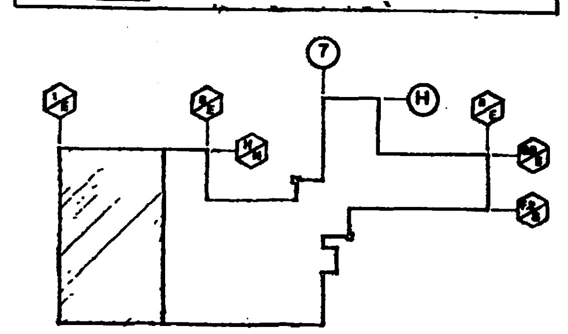


1 / S2.1 PARTIAL PILE LAYOUT PLAN

1/8"=1'-0"

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. DENOTES NEW 12" SQUARE x 60'-0" LONG PRECAST, PRESTRESSED DRIVEN PILE. TOP OF PILE ELEVATION = +107'-3-1/2" UNLESS OTHERWISE NOTED.
4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.4 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. IP-# DENOTES INDICATOR PILE SEE SPECIFICATIONS



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EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	1-18-96	IN SERVICE 26 AUG 94 AS BUILT INSP. PYL

Date: 7/29/91

Sheet Title: Partial Pile Layout Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 86/178 S2.1 Revision 0

USER: RCA
DATE: 1-18-96
FILE: /USR2/SD185/STRUCT/S2.1.DGN

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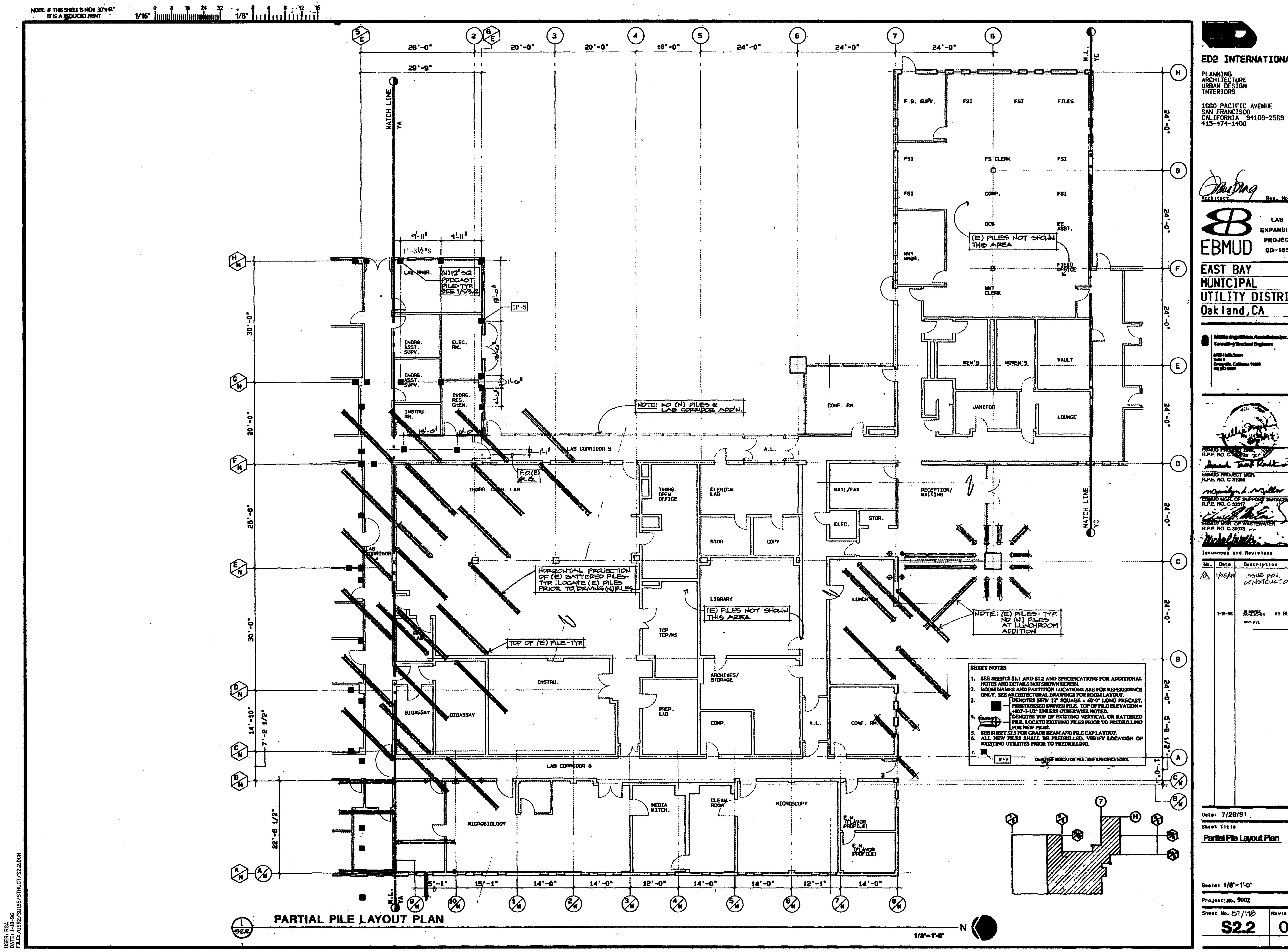
NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT
WATCH LINE YA
WATCH LINE YC
(N) 12" SQ. PRECAST PILE-TYP. SEE 1/S3.2
(E) PILES NOT SHOWN THIS AREA
NOTE: NO (N) PILES @ LAB CORRIDOR ADD'N.
HORIZONTAL PROJECTION OF (E) BATTERED PILES-TYP. LOCATE (E) PILES PRIOR TO DRIVING (N) PILES
TOP OF (E) PILE-TYP.
NOTE: (E) PILES-TYP. NO (N) PILES AT LUNCHROOM ADDITION
LAB CORRIDOR 5
LAB CORRIDOR 6
INSTRU.
BIOASSAY
MICROBIOLOGY
MEDIA KITCH.
CLEAN ROOM
MICROSCOPY
LIBRARY
ARCHIVES/ STORAGE
CLERICAL LAB
MAIL/FAX
RECEPTION/ WAITING
CONF. RM.
JANITOR
LOUNGE
VAULT
MEN'S
WOMEN'S
SHEET NOTES
1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. DENOTES NEW 12" SQUARE x 60'-0" LONG PRECAST, PRESTRESSED DRIVEN PILE. TOP OF PILE ELEVATION = +107-3-1/2" UNLESS OTHERWISE NOTED.
4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.5 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. IP-# DENOTES INDICATOR PILE. SEE SPECIFICATIONS.
PARTIAL PILE LAYOUT PLAN
1/8"=1'-0"
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EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA
Issuance and Revisions
ISSUE FOR CONSTRUCTION
AS BUILT
Date: 7/29/91
Sheet Title
Partial Pile Layout Plan
Scale: 1/8"=1'-0"
Project No. 9002
S2.2
Revision 0
USER: RGA
DATE: 1-18-96
FILE: /USR2/SD165/STRUCT/S2.2.DGN

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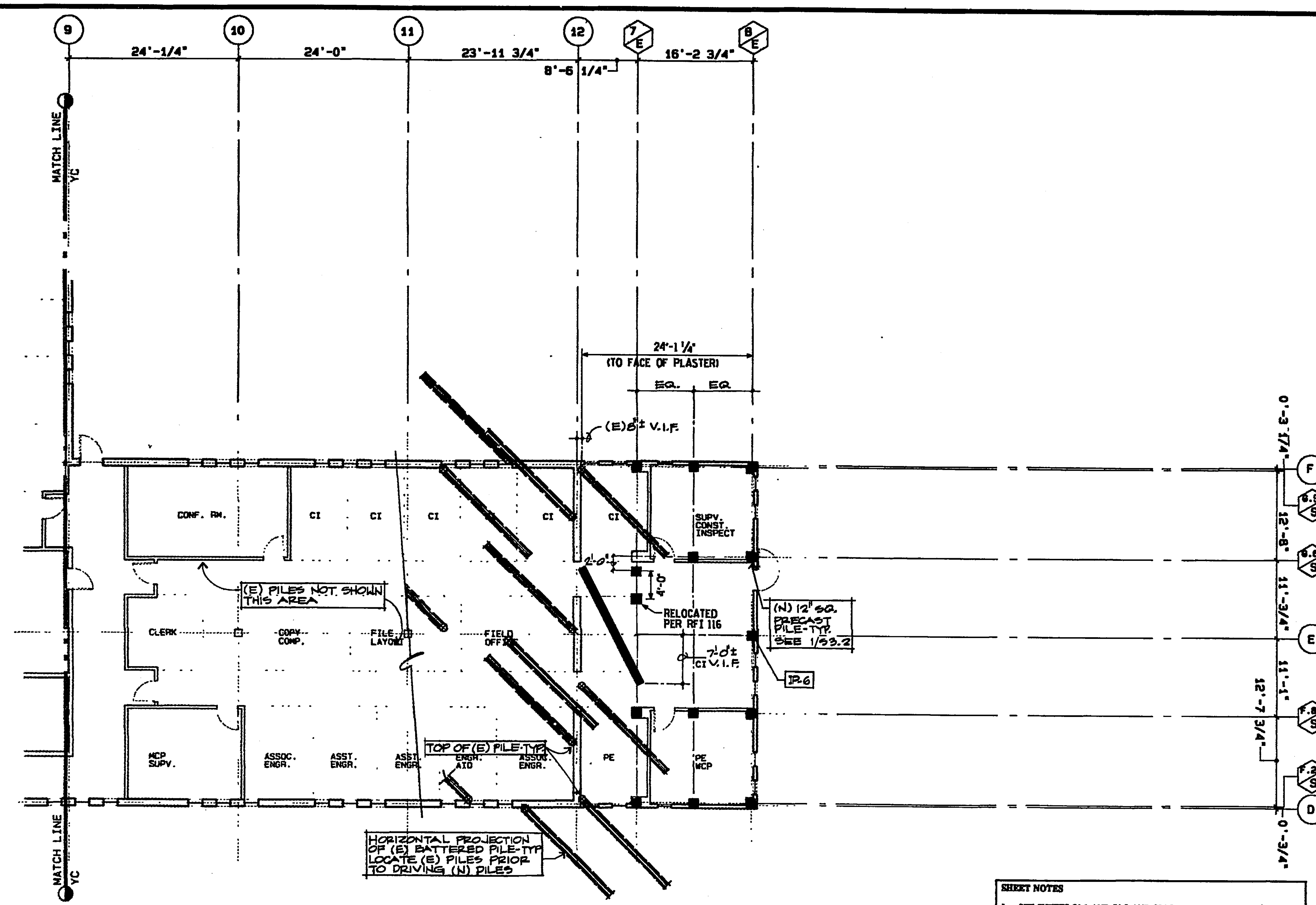


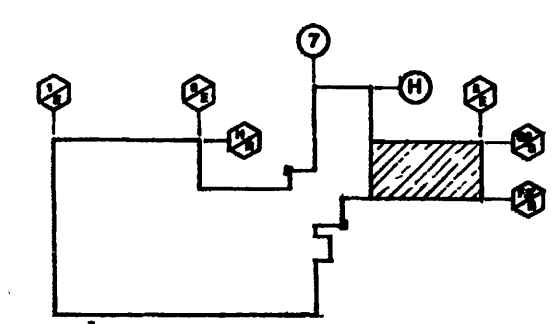
1 / S2.3 PARTIAL PILE LAYOUT PLAN

1/8"=1'-0"

N

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. DENOTES NEW 12" SQUARE x 60'-0" LONG PRECAST. PRESTRESSED DRIVEN PILE. TOP OF PILE ELEVATION = +109'-4" UNLESS OTHERWISE NOTED.
4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.6 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. P-# DEMOTES INDICATOR PILE SEE SPECIFICATIONS



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Oakland, CA

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EBMUD PROJECT MGR. R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E. NO. C [illegible]76

Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	8-1-95	IN SERVICE 26 AUG 1994 AS BUILT DISP. PYL

Date: 7/29/91

Sheet Title: Partial Pile Layout Plan

Scale: 1/8"=1'-0"

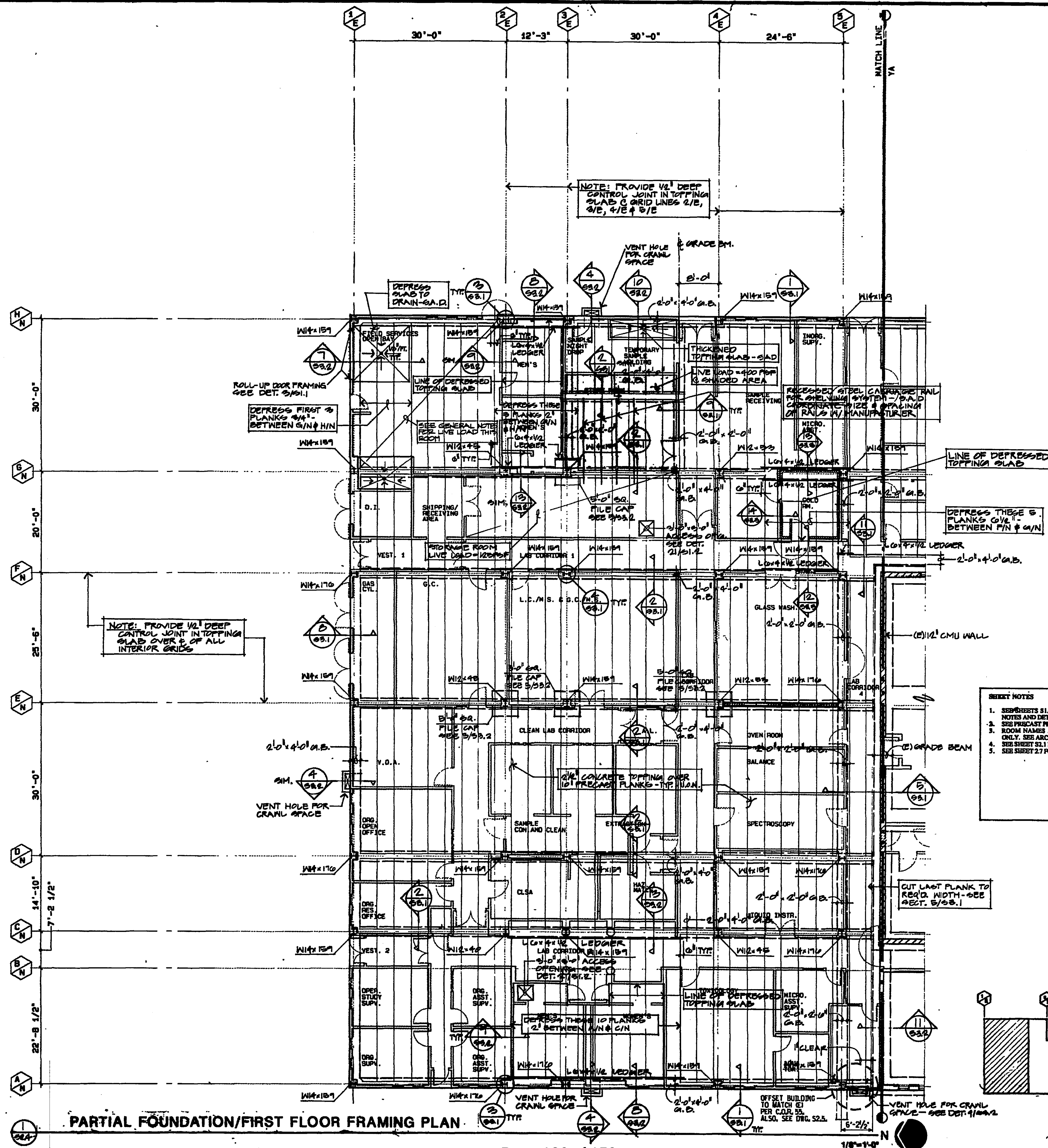
Project No. 9002

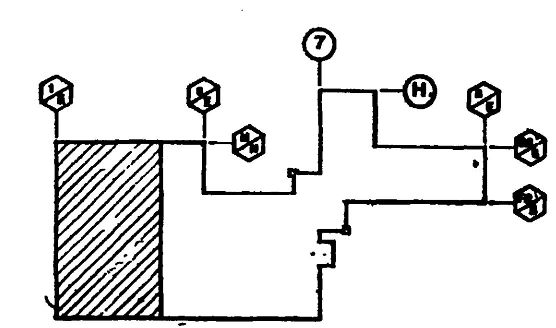
Sheet No. 88/178 S2.3

Revision 0

USER: ROW
DATE: 8-1-95
FILE: /usr2/eby/sd185/s2.3.dgn

OK 9/16/96





SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.1 FOR PILE LAYOUT.
5. SEE SHEET 2.7 FOR ROOF FRAMING.

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R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9-28-93	PHASE 1 AS BUILTS
	8-1-95	26 AUG 1994 AS BUILT

Date: 7/29/91

Sheet Title: Partial Foundation/First Floor Framing Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 89/178

S2.4

Revision 0

USER: RDW
DATE: 8-1-95
FILE: /usr2/eby/sd185/s2.4.dgn

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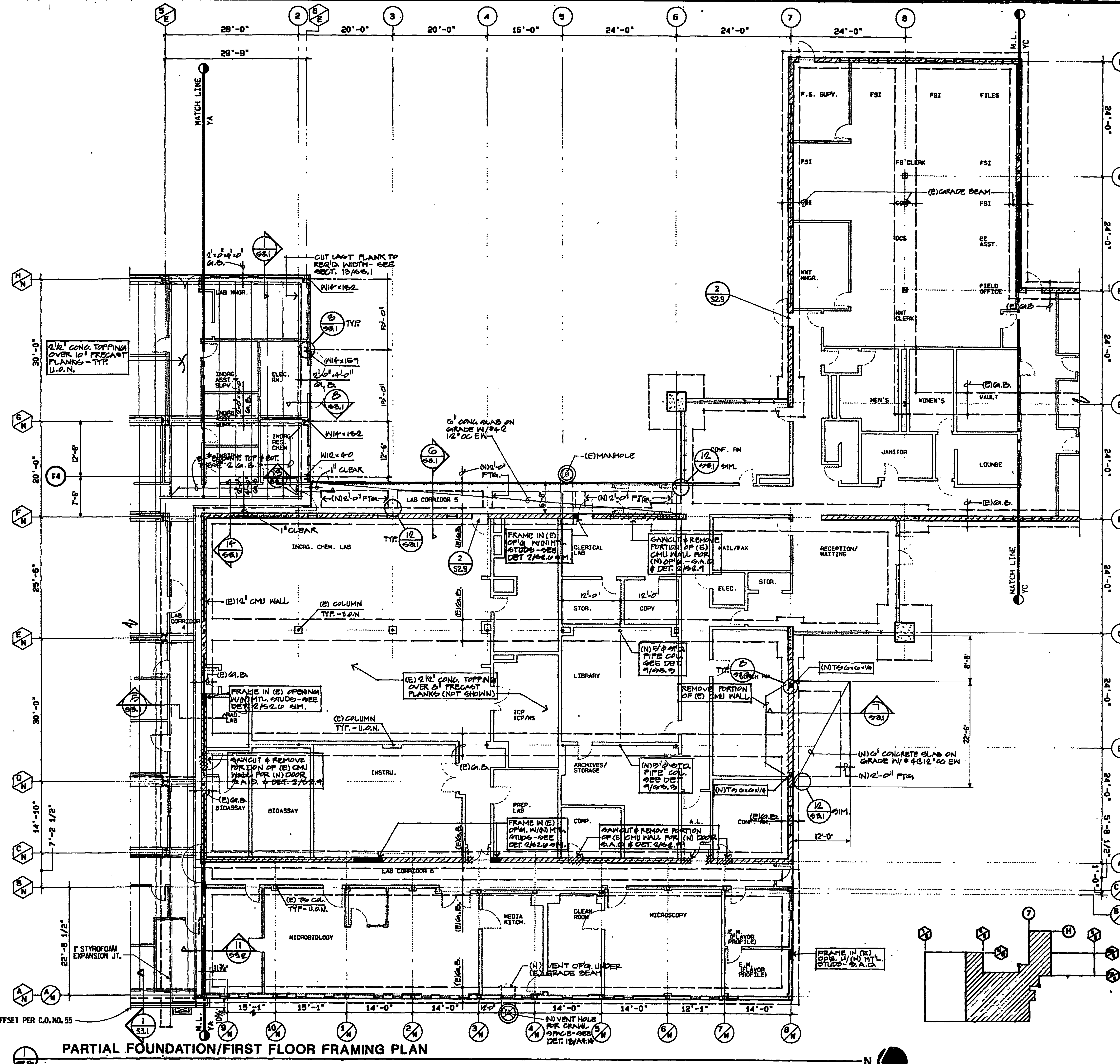

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.2 FOR PILE LAYOUT.
5. SEE SHEET 2.8 FOR ROOF FRAMING.

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EBMUD MGR. OF WASTEWATER

Issuances and Revisions

No.	Date	Description
1	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE I AS BUILTS
	29SEP95	AS BUILT

Date: 7/29/91
Sheet Title: Partial Foundation/First Floor Framing Plan
Scale: 1/8"=1'-0"
Project No. 9002
Sheet No. 90/178 — S2.5
Revision 0

USER: RWE
DATE: 29SEP95
FILE: SD185/STRUCT/S2.5.DGN

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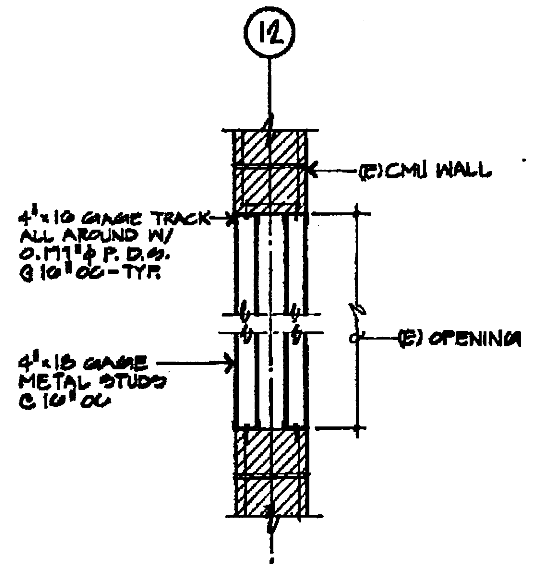
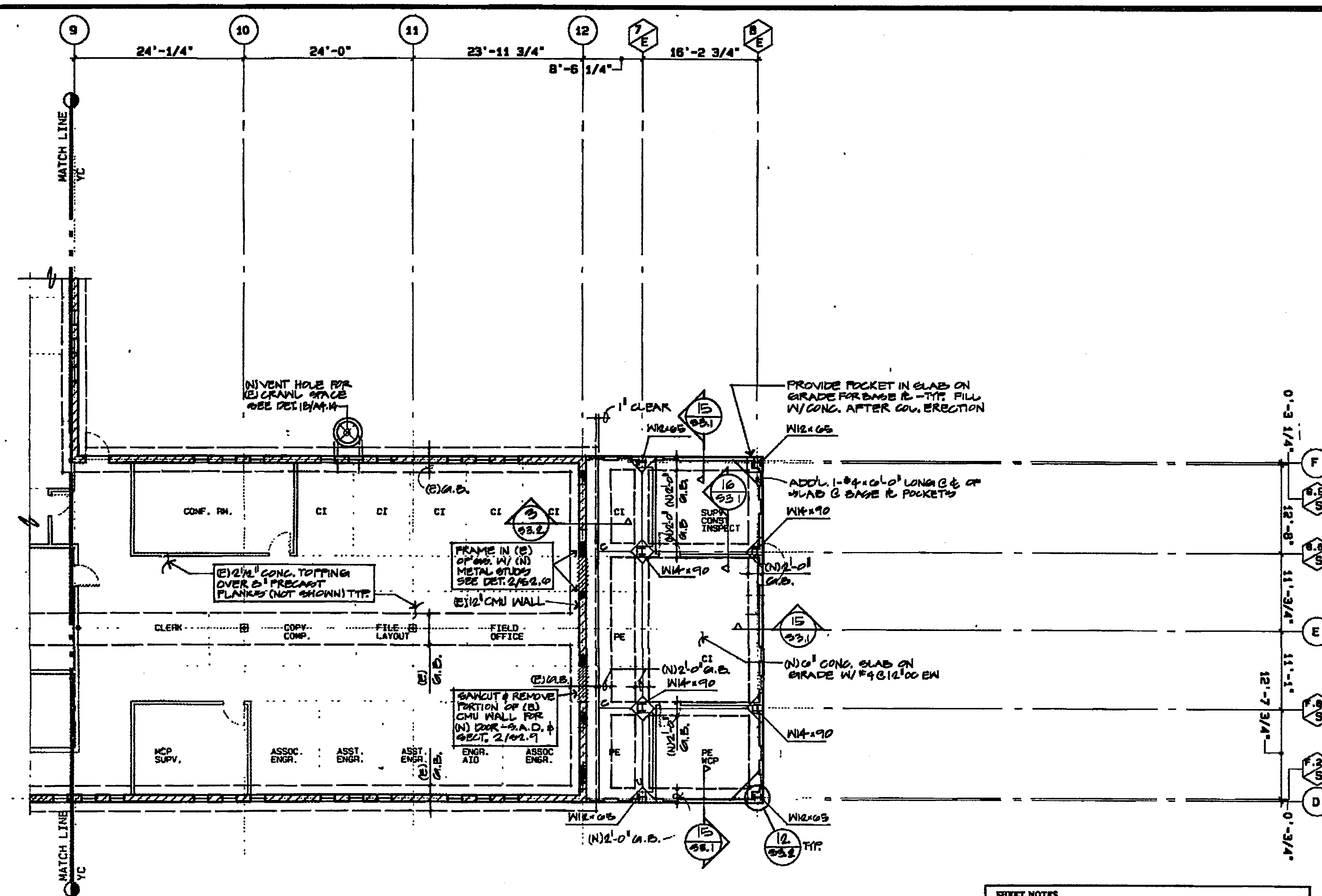


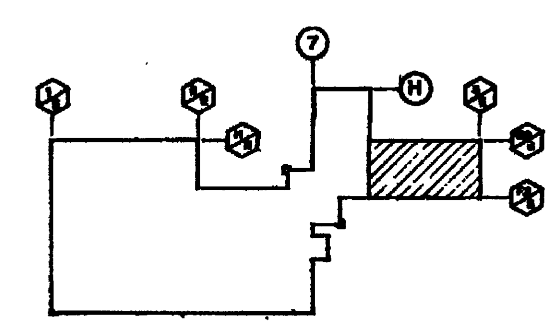
DETAIL @ "FRAMED IN" (E) OPENING 3/4"=1'-0"



PARTIAL FOUNDATION/FIRST FLOOR FRAMING PLAN 1/8"=1'-0"

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.3 FOR PILE LAYOUT.
5. SEE SHEET 2.9 FOR ROOF FRAMING.



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EAST BAY MUNICIPAL UTILITY DISTRICT
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EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317
EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	10-17-95	26 aug 1994 AS BUILT

Date: 7/29/91

Sheet Title: Partial Foundation/First Floor Framing Plan

Scale: 1/8"=1'-0" U.O.N.

Project No. 9002

Sheet No. 91/178 S2.6

Revision 0

USER: RWE DATE: 17OCT95 FILE: /SD165/STRUCT/S2.6.DGN

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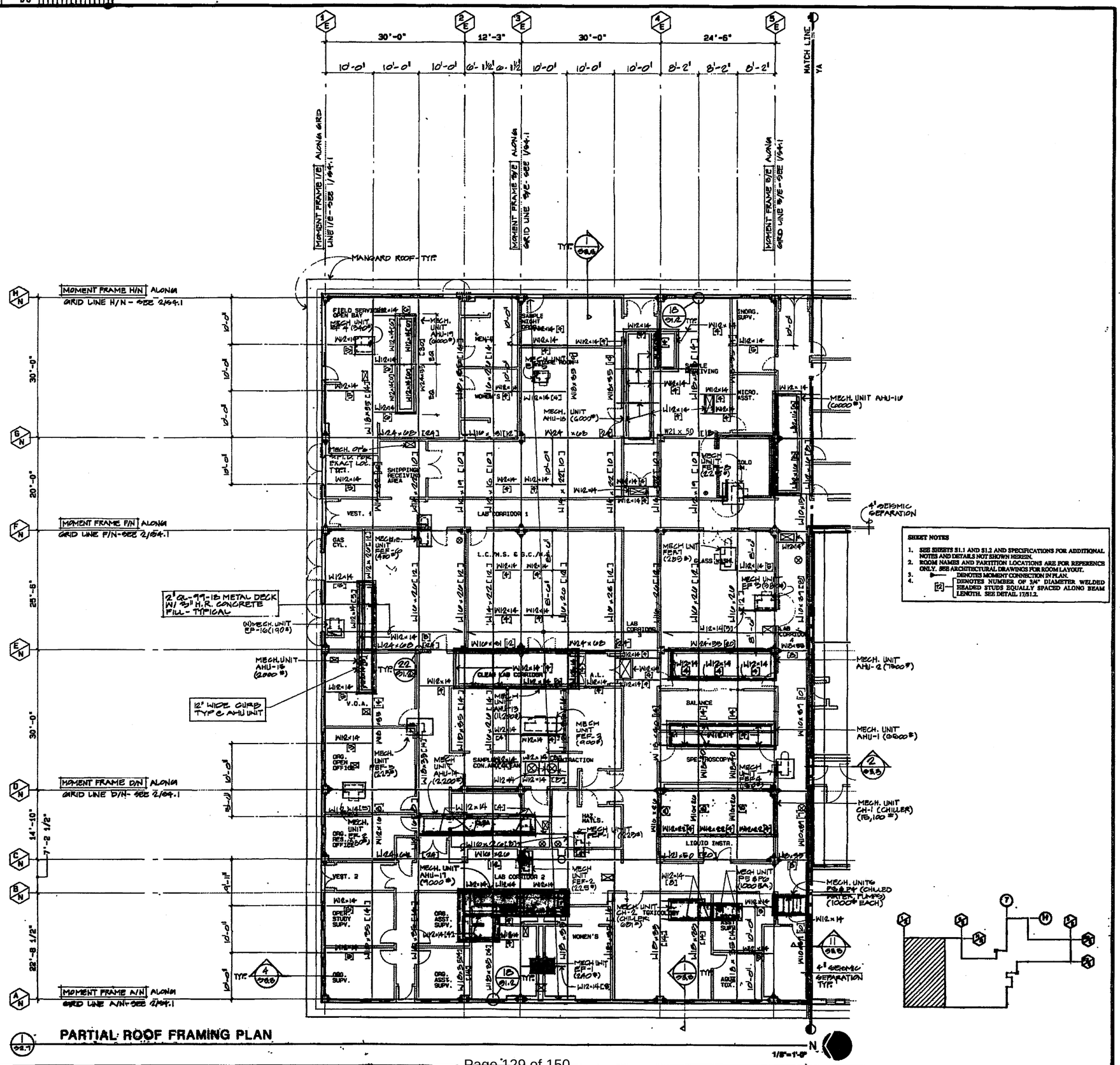

PARTIAL ROOF FRAMING PLAN

1/8"=1'-0"

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Issuances and Revisions

No.	Date	Description
1	1/25/91	ISSUE FOR CONSTRUCTION
	10-19-95	AS BUILT DUG 1994 AS BUILT BRP. PYL

Date: 7/29/91

Sheet Title: Partial Roof Framing Plan

Scale: 1/8"=1'-0"

Project No. 9082

Sheet No. 92/178 S2.7

Revision 0

USER: RWE
DATE: 10/15/96
FILE: J:\JOBS2\5085\STRUCT\S2.7.DGN

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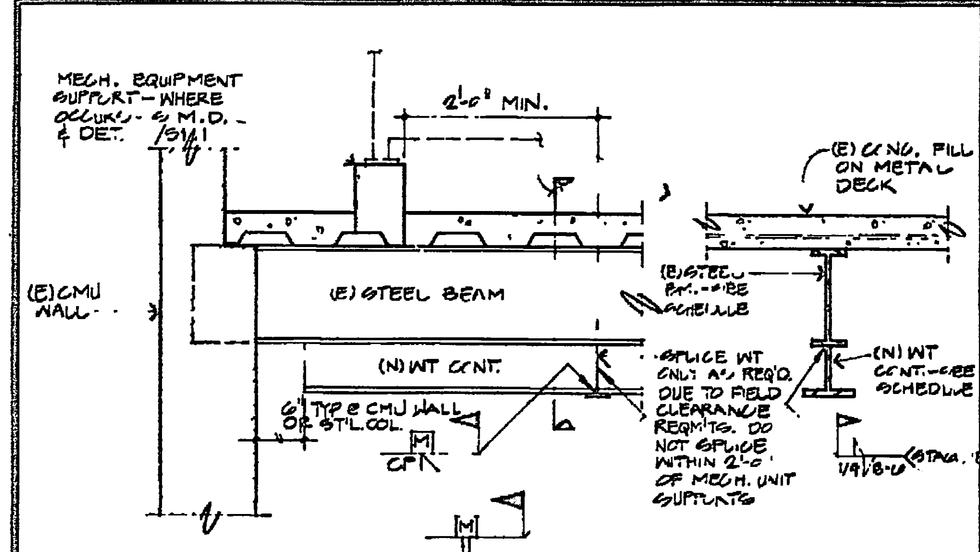
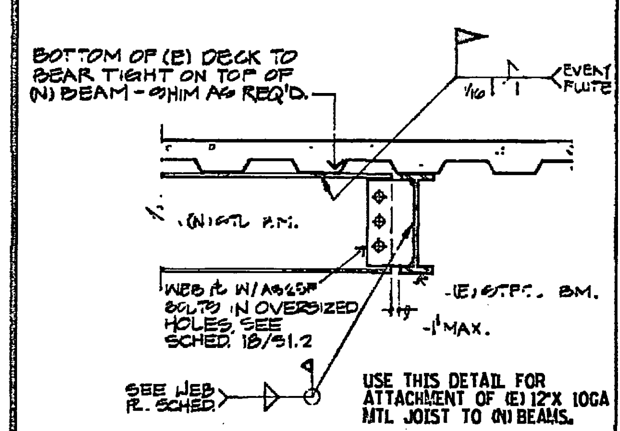


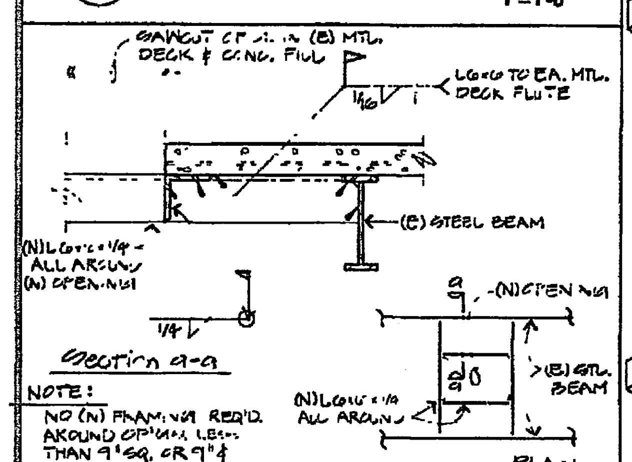
STRENGTHENED EXISTING BEAM SCHEDULE

MARK	(E) STL. BM.	(N) WT CONT.
(N) BEAM A	W12×14	WT6×15
(N) BEAM B	W12×16.5	WT6×15
(N) BEAM C	W12×31	WT5×11
(N) BEAM D	W16×40	WT6×15
(N) BEAM E	W12×26	WT6×15
(N) BEAM F	W12×16.5	WT4×10.5
(N) BEAM G	W16×45	WT6×15

2/S2.8 DETAIL FOR STRENGTHENING (E) STEEL BEAMS 1"=1'-0"

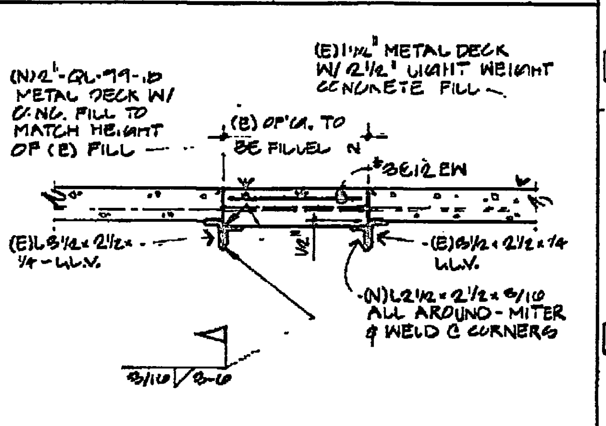


3/S2.8 (N) TO (E) STL. BM. CONNECTION 1"=1'-0"

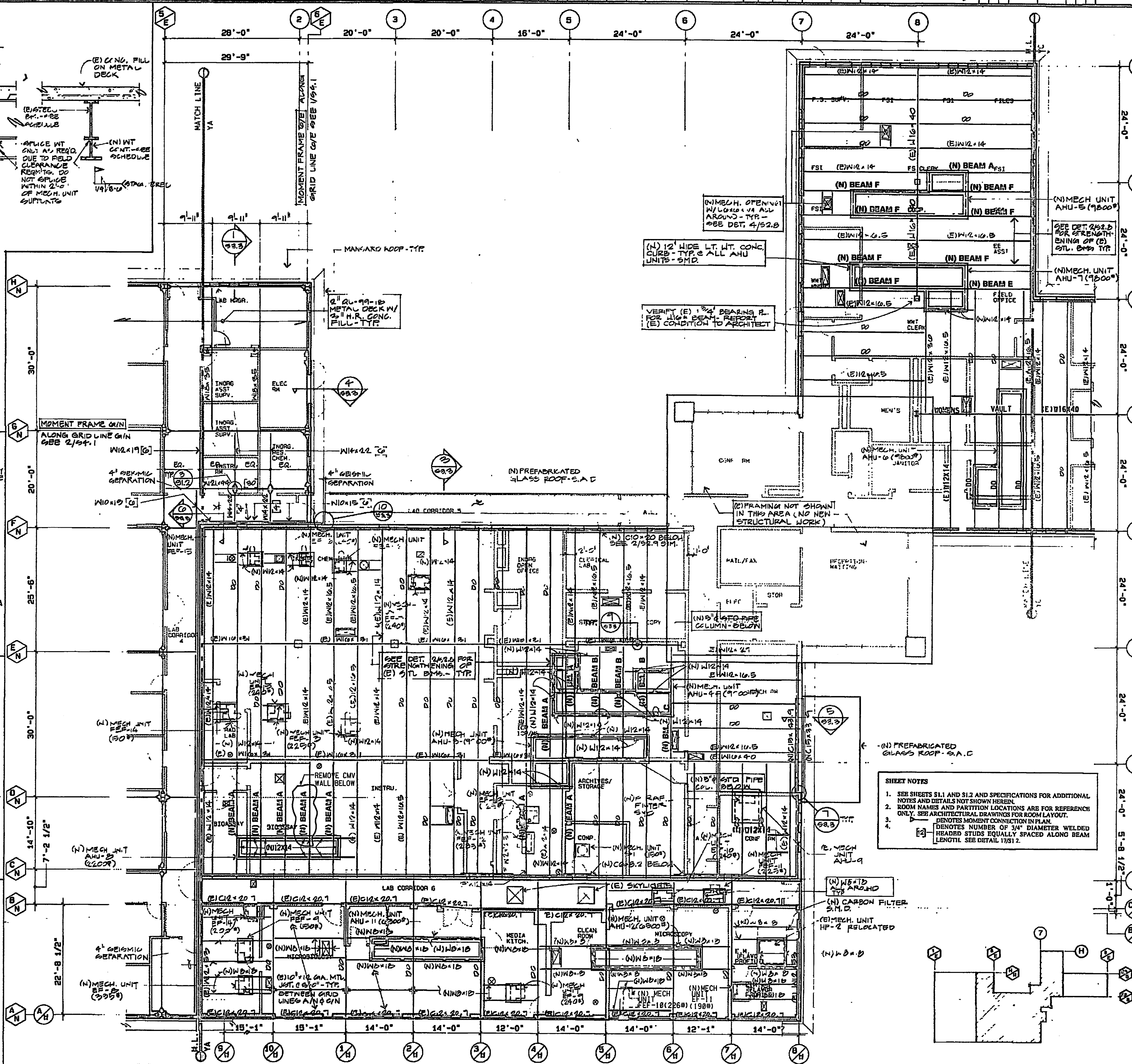


NOTE: NO (N) FRAMING REQ'D. AROUND OPNGS. LESS THAN 9"SQ. OR 9"⌀

4/S2.8 TYP. (N) OPG. IN (E) MTL. DECK 1"=1'-0"



5/S2.8 TYP. INFILL OF (E) ROOF OPGS. 1"=1'-0"



SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. ▷— DENOTES MOMENT CONNECTION IN PLAN.
4. [12]— DENOTES NUMBER OF 3/4" DIAMETER WELDED HEADED STUDS EQUALLY SPACED ALONG BEAM LENGTH. SEE DETAIL 17/S1.2.

1/S2.8 PARTIAL ROOF FRAMING PLAN 1/8"=1'-0"

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EBMUD PROJECT MGR. R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
△	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	10-24-95	IN SERVICE 26 AUG 1994 AS BUILT INSP. PYL

Date: 7/29/91

Sheet Title: Partial Roof Framing Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 93/178 S2.8 | Revision 0

USER: RGA
DATE: 1-19-96
FILE: /USR2/SD185/STRUCT/S2.8.DGN

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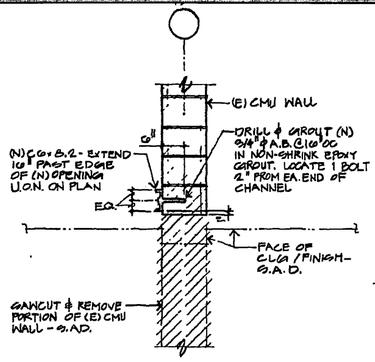
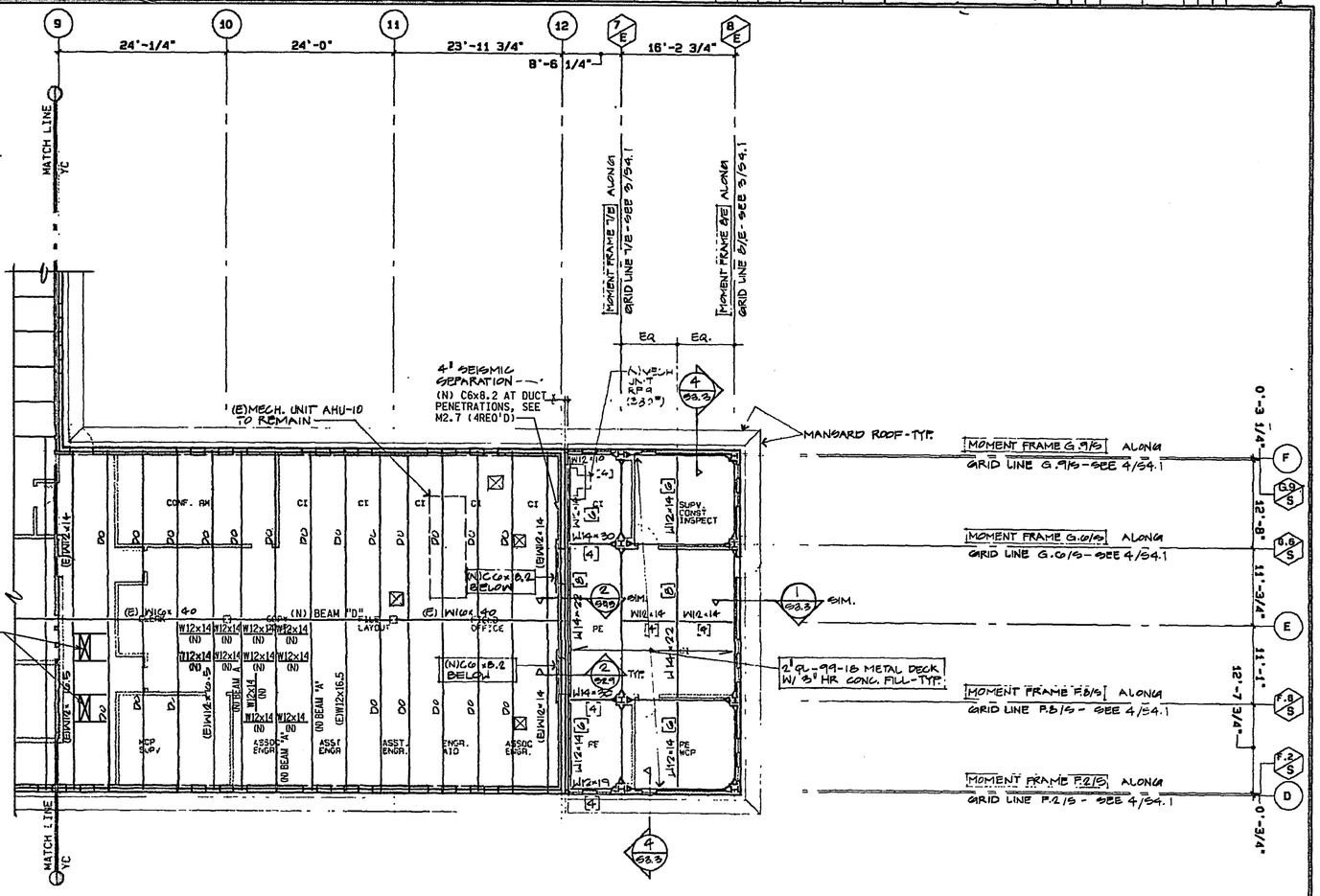


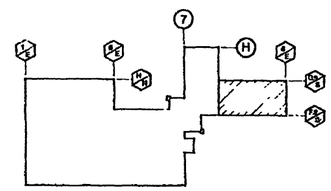
2 / S2.9 SECT. @ (N) OPG. IN (E) CMU WALL 3/4"=1'-0"



SHEET NOTES

1. SEE SHEETS S3.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. ▷——— DENOTES MOMENT CONNECTION IN PLAN.
4. [•] DENOTES NUMBER OF 3/4" DIAMETER WELDED HEADED STUDS EQUALLY SPACED ALONG BEAM LENGTH. SEE DETAIL 17/S12

1 / S2.9 PARTIAL ROOF FRAMING PLAN 1/8"=1'-0"



USER: RSA
DATE: 10-21-96
FILE: /SD185/STRUCT/S2.9.DGN

OK 9/10/96 RMLee

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EBMUD MGR. OF SUPPORT SERVICES R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER R.P.E NO C 30976

Issuances and Revisions

No.	Date	Description
0	1/25/94	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	IN SERVICE	AS BUILT
	BID.	

Date: 7/29/91

Sheet Titl.
Partial Roof Framing Plan

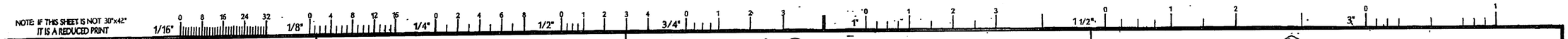
Scale: 1/8"=1'-0"

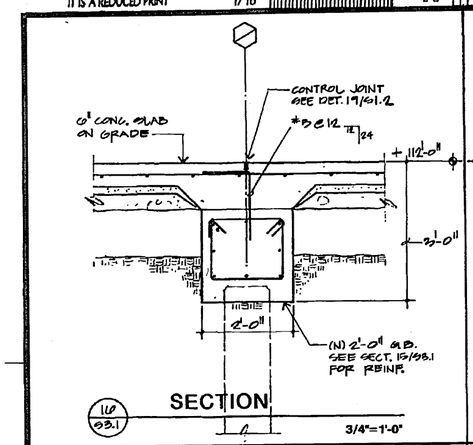
Project No. 9002

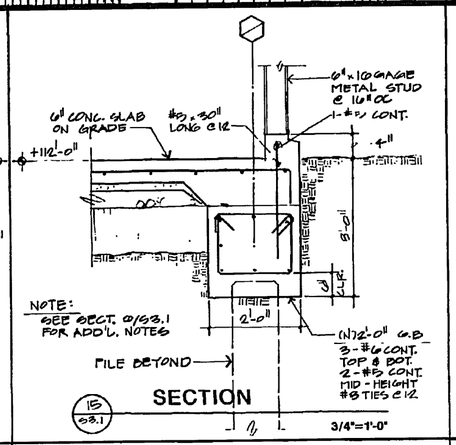
Sheet No. 94/178 — Revision 0

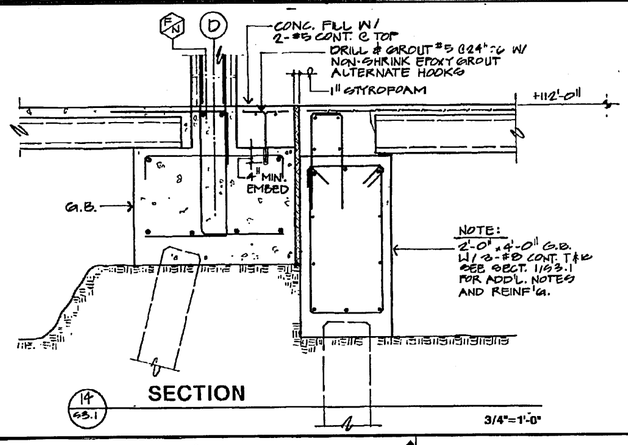
S2.9

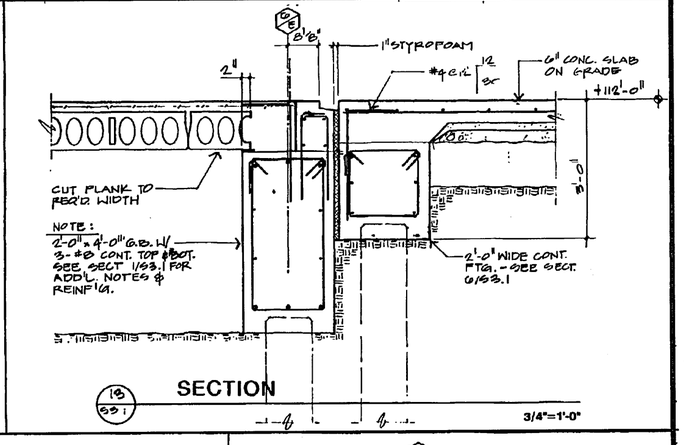
NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT

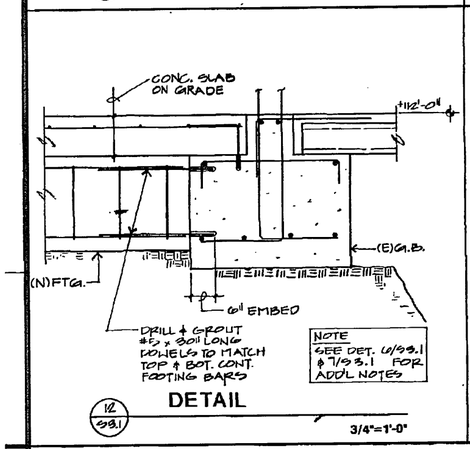


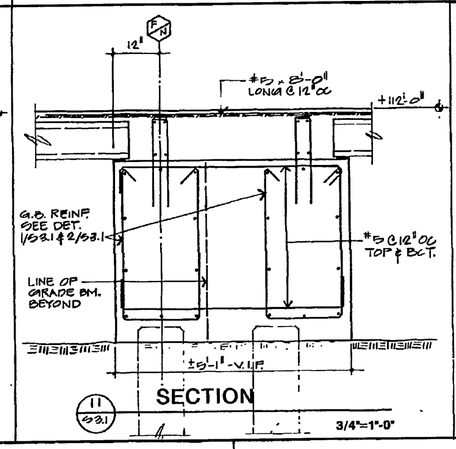


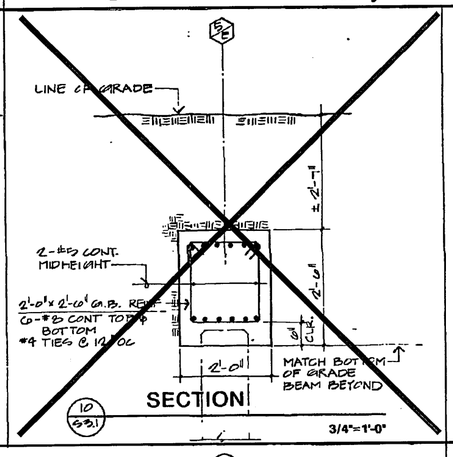


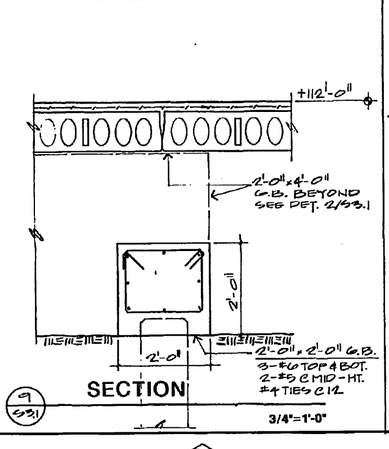


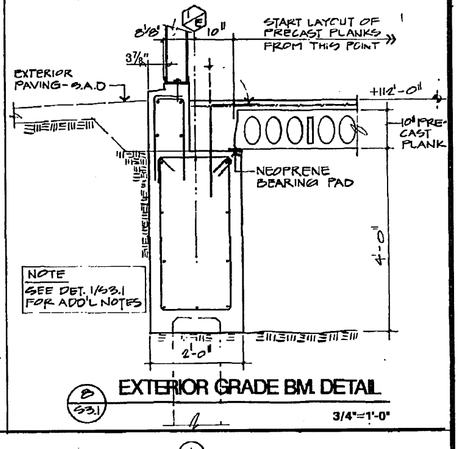


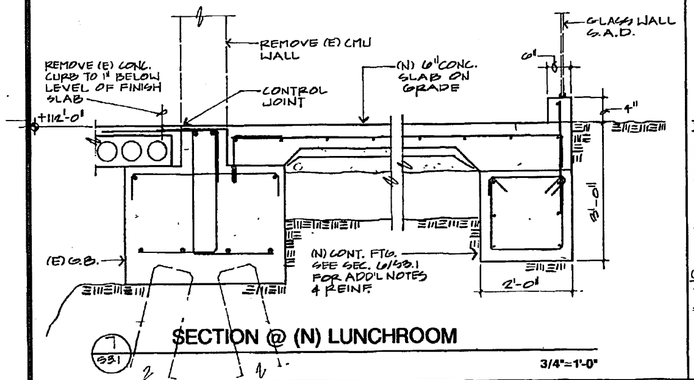


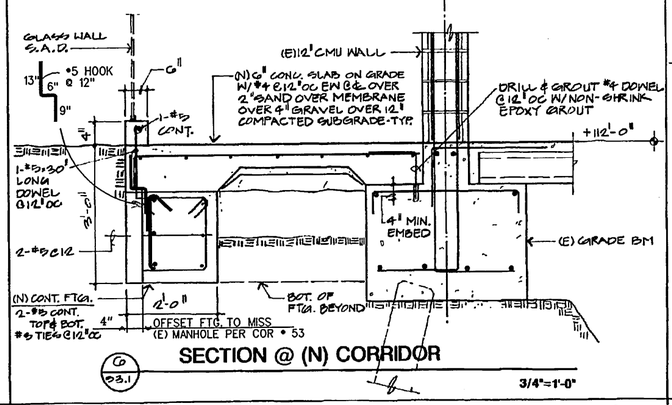


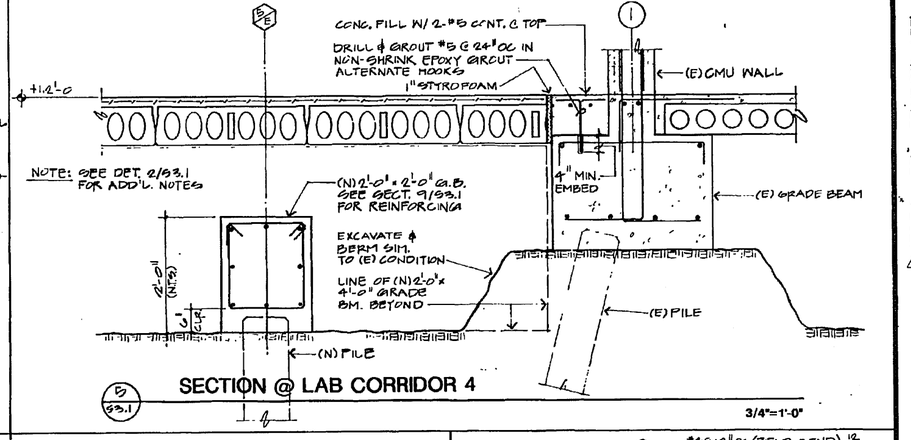


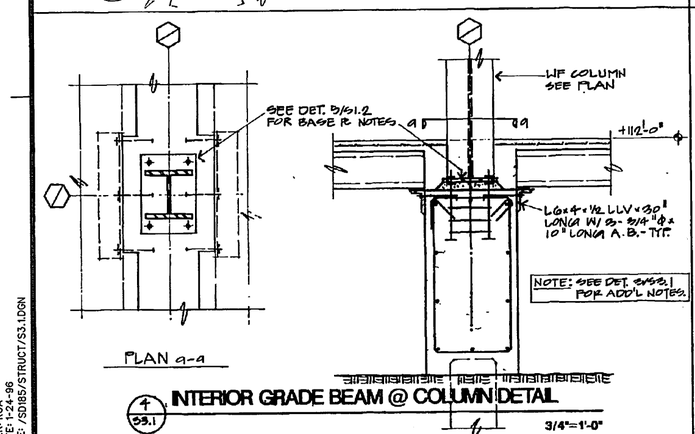


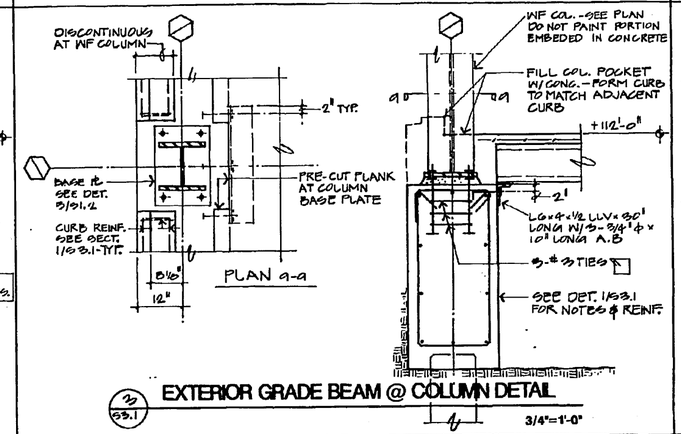


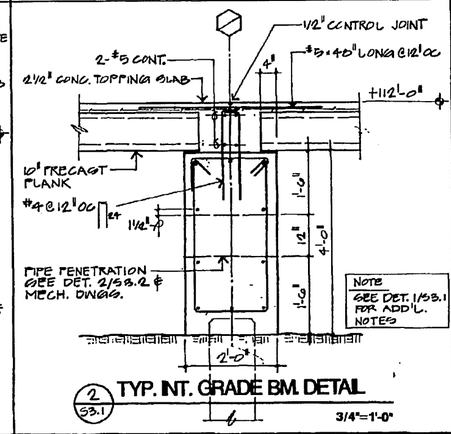


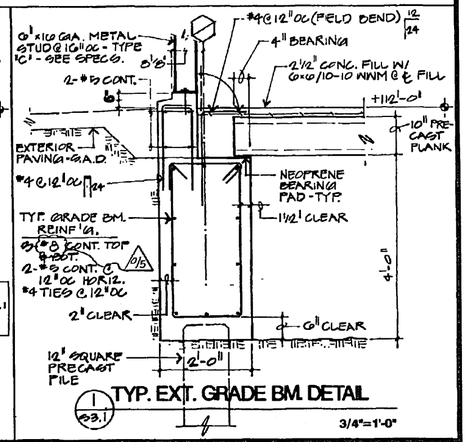












USER: RGA
DATE: 1-24-96
FILE: /SD185/STRUCT/S3.1.DGN

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R.P.E. NO. C 39976

Issuances and Revisions

No.	Date	Description
1	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM 5
	9/28/93	PHASE 1 AS BUILTS
	10-17-95	RECEIVED 26 AUG 1996 AS BUILT INSP. PYL

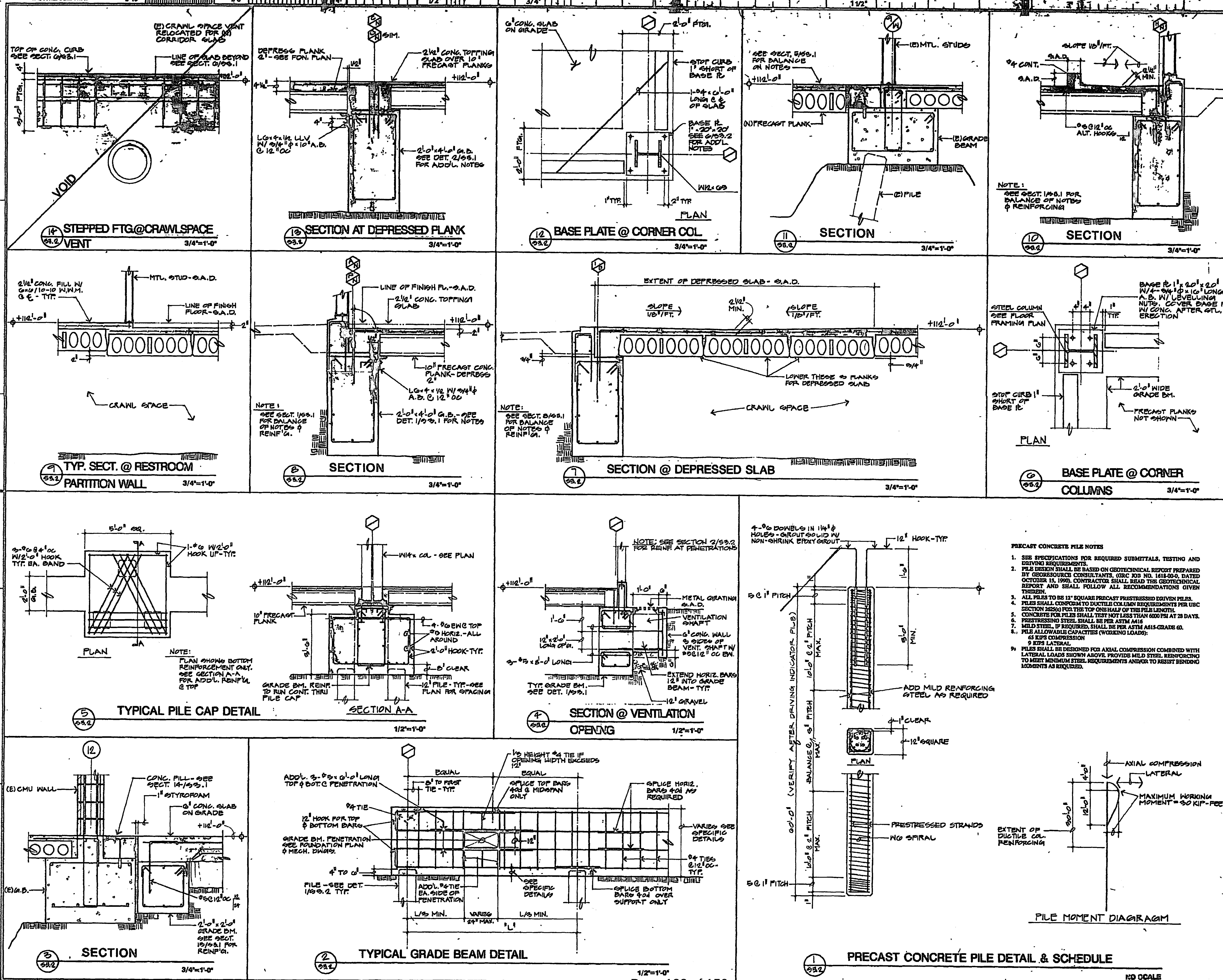
Date 7/29/91

Sheet Title
Foundation Sections & Details

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

Project No. 9002

S3.1 | 0
Sheet No. 95/178 | Revision



PRECAST CONCRETE PILE NOTES

1. SEE SPECIFICATIONS FOR REQUIRED SUBMITTALS, TESTING AND DRIVING REQUIREMENTS.
2. PILE DESIGN SHALL BE BASED ON GEOTECHNICAL REPORT PREPARED BY GEORESOURCE CONSULTANTS, (GRC JOB NO. 1618-00-0, DATED OCTOBER 15, 1990). CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL FOLLOW ALL RECOMMENDATIONS GIVEN THEREIN.
3. ALL PILES TO BE 12" SQUARE PRECAST PRESTRESSED DRIVEN PILES.
4. PILES SHALL CONFORM TO DUCTILE COLUMN REQUIREMENTS PER UBC SECTION 2625(c) FOR THE TOP ONE HALF OF THE PILE LENGTH.
5. CONCRETE FOR PILES SHALL TEST NOT LESS THAN 6000 PSI AT 28 DAYS.
6. PRESTRESSING STEEL SHALL BE PER ASTM A416
7. MILD STEEL, IF REQUIRED, SHALL BE PER ASTM A615-GRADE 60.
8. PILE ALLOWABLE CAPACITIES (WORKING LOADS):
   65 KIPS COMPRESSION
   9 KIPS LATERAL
9. PILES SHALL BE DESIGNED FOR AXIAL COMPRESSION COMBINED WITH LATERAL LOADS SHOWN ABOVE. PROVIDE MILD STEEL REINFORCING TO MEET MINIMUM STEEL REQUIREMENTS AND/OR TO RESIST BENDING MOMENTS AS REQUIRED.

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LAB EXPANSION PROJECT SD-185
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EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

EBMUD PROJECT ENG.
R.P.E. NO. C 39959
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R.P.E. NO. C 31968
EBMUD MGR. OF SUPPORT SERVICES
R.P.E. NO. C 33317
EBMUD MGR. OF WASTEWATER
R.P.E. NO. C 30376

Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	1-24-96	IN SERVICE 26 AUG 94 AS BUILT INSP. PYL

Date 7/29/91
Sheet Title
Pile & Foundation Sections & Details
Scale: 3/4"=1'-0" U.O.N.
Project No. 9002
S3.2 | 0
Sheet No. 96/178 Revision

NOTE: IF THIS SHEET IS NOT 30"x40" IT IS A REDUCED PRINT

USER: RGA
DATE: 1-24-96
FILE: I:/SD185/STRUCT/S3.2.DGN

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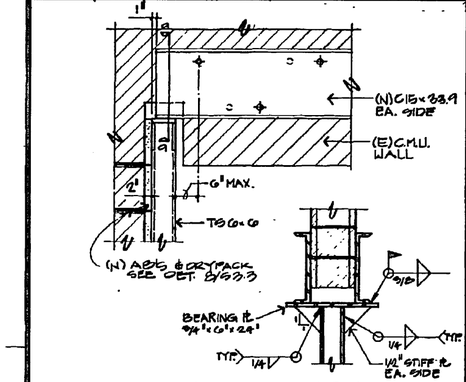
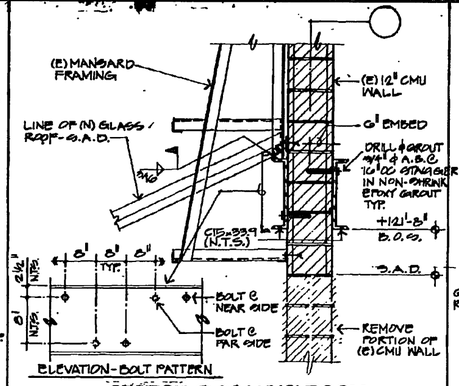
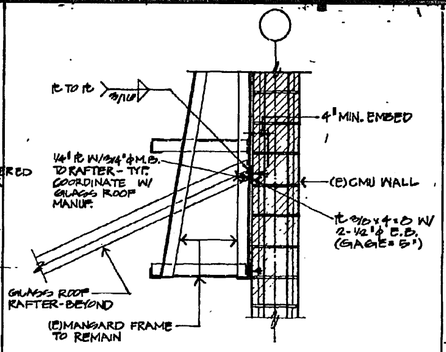


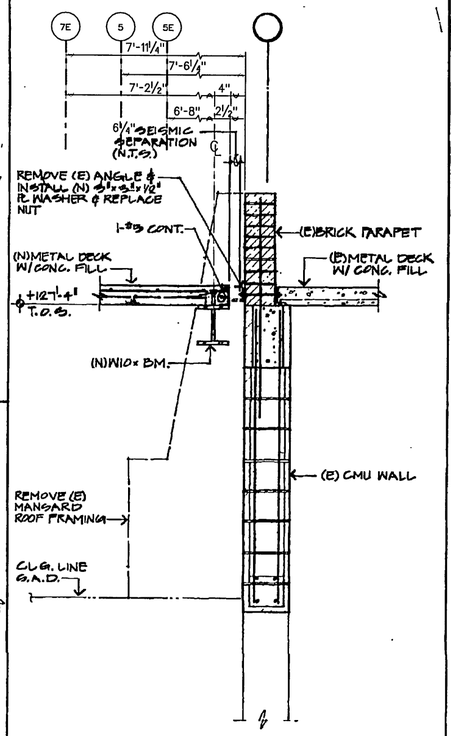
1/S3.3 DETAIL SECTION a-a 3/4"=1'-0"



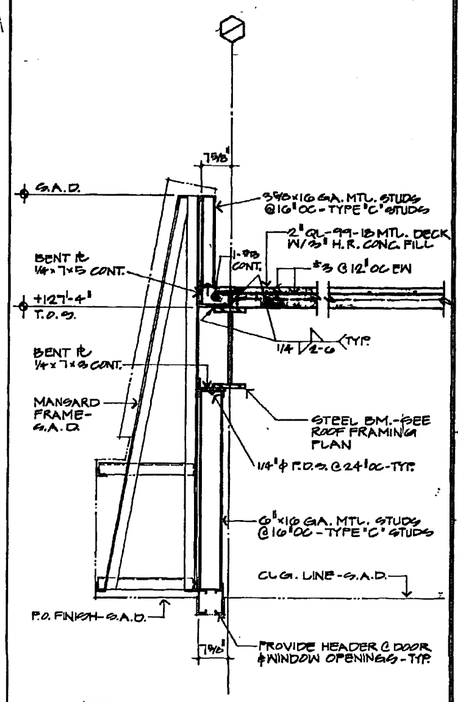
5/S3.3 SECTION @ (N) LUNCHROOM OPENING 3/4"=1'-0"



3/S3.3 SECT. @ (N) "GREENHOUSE" ENCLOSURE 3/4"=1'-0"

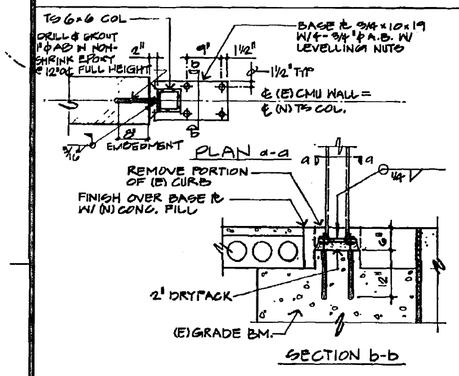


2/S3.3 SECT. @ SEISMIC SEPARATION 3/4"=1'-0"

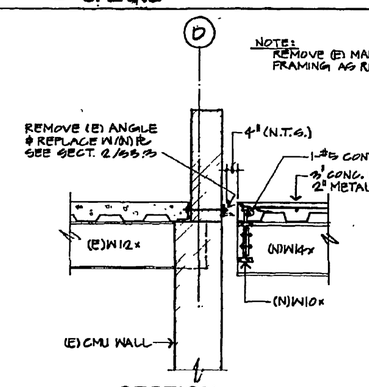


4/S3.3 TYPICAL SECTION 3/4"=1'-0"

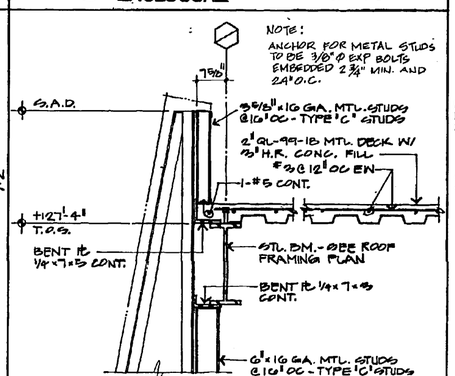
1/S3.3 TYPICAL SECTION 3/4"=1'-0"



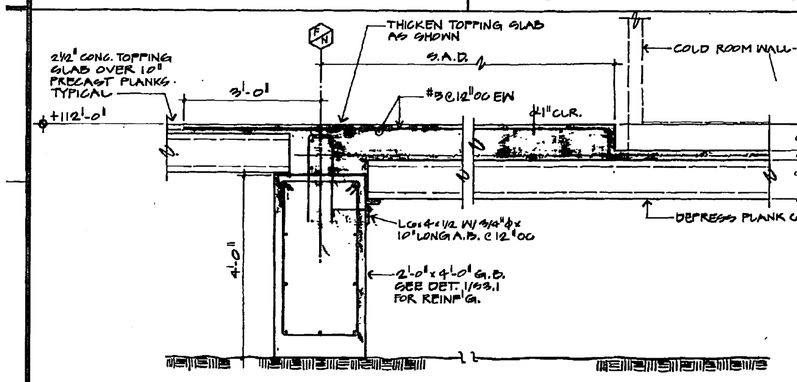
B/S3.3 DETAIL 3/4"=1'-0"



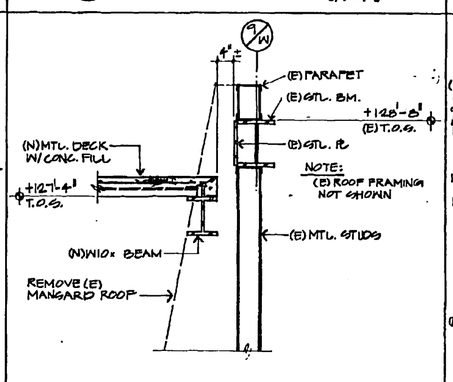
C/S3.3 SECTION 3/4"=1'-0"



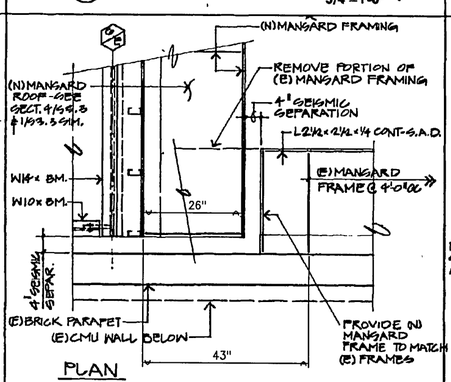
4/S3.3 TYPICAL SECTION 3/4"=1'-0"



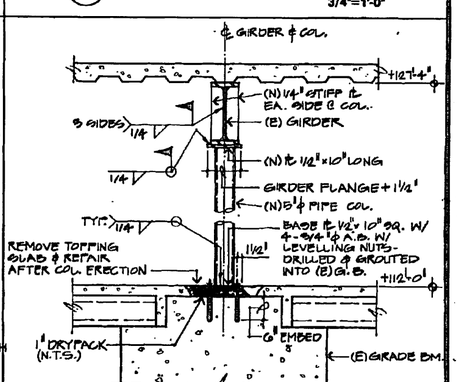
12/S3.3 SECTION @ DEPRESSED PLANK FOR COLD ROOM 3/4"=1'-0"



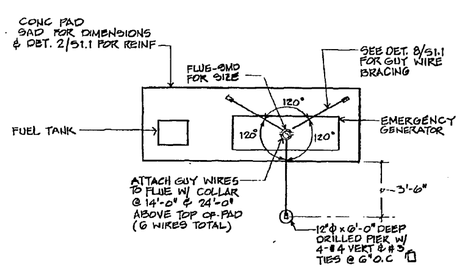
11/S3.3 SECT. @ SEISMIC SEPARATION 3/4"=1'-0"



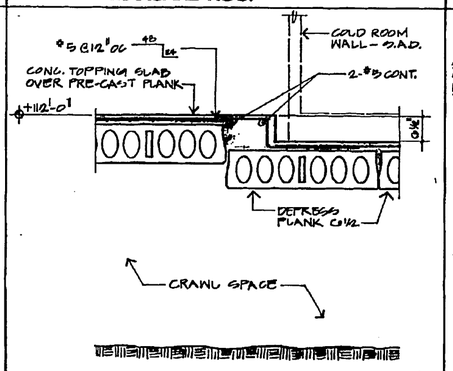
10/S3.3 SEISMIC SEPARATION @ MANSARD ROOF 3/4"=1'-0"



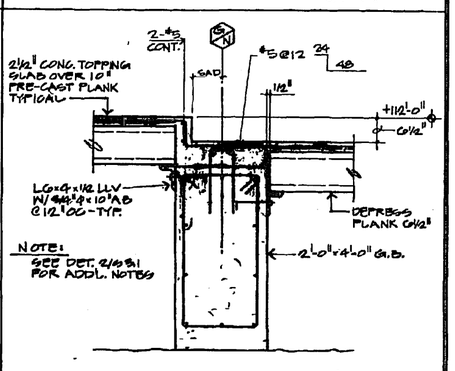
9/S3.3 (N) COLUMN @ (E) GIRDER 3/4"=1'-0"



15/S3.3 EMERGENCY GENERATOR FLUE BRACING



14/S3.3 SECTION @ DEPRESSED PLANK FOR COLD ROOM 3/4"=1'-0"



13/S3.3 SECTION @ COLD ROOM FOUNDATION 3/4"=1'-0"

USER: RGA
DATE: 1-24-96
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DIETZGEN POST REORDER NO 100007

ED2 International
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SAN FRANCISCO
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Architect Reg. No.

LAG EXPANSION
EBMUD PROJECT NO. 9D-185
EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

Mellis Ingraham Associates Inc.
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Emeryville, California 94608
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EBMUD PROJECT ENGR.
R.P.E. NO. C 39059

EBMUD PROJECT MGR.
R.P.E. NO. C 31966

EBMUD MGR. OF SUPPORT SERVICES
R.P.E. NO. C 33317

EBMUD MGR. OF WASTEWATER
R.P.E. NO. C 30976

Issuances and Revisions

No.	Date	Description
2	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM No 4, 5
	9/28/93	PHASE 1 AS BUILTS
	1-24-96	RECEIVED 26 AUG 96 AS BUILT INSP. PYL

Date 7/29/91

Sheet Title
Sections & Details

Scale: 3/4"=1'-0" U.O.N.

Project No. 9002

S3.3 | 0

Sheet No. 91/178 | Revision

(Excerpts)

Seismic Evaluation Administrative Building and Laboratory

East Bay Municipal Utility District

Main Wastewater Treatment Plant Seismic Structural Evaluation and Conceptual Design Project

2.0 STRUCTURE DESCRIPTION

The Admin building and Lab are structurally connected as a single building. The entire building is a single-story structure except for a two-story "pop-up" located in the middle portion of the building.

The building was constructed in three phases with the original construction in 1974, the West Lab addition in 1984 and the North Lab and South Admin additions in 1994. A seismic retrofit of the 1974 and 1984 construction was performed in 1988.

2.1 AVAILABLE DATA

The available data for the building includes 15 structural drawings for the original, 1974, structure, 7 structural drawings for West Lab addition and seismic improvements, and 19 structural drawings for the South Admin and the North Lab additions. Additionally, 30 architectural drawings were available for review. Material properties for only some of the structural components are specified in the drawings. Data not available was assumed based on ASCE 41-17 recommendations.

2.2 GENERAL DESCRIPTION

The Admin and Lab building is a complex structure consisting of the original Admin building, the original Lab building, the Pop-Up structure, the West Lab addition, the North Lab addition, and the South Admin addition. Plan view of the entire structure, with the various additions highlighted, is shown in Figure 1. The North and South elevations of the building are shown in Figure 2 with photographs of the building exterior shown in Figure 3 through Figure 7.

In 1974, as part of project SD122A, the Admin and Lab buildings were designed as a single building with two wings. The 1974 construction consisted of concrete-filled metal deck roof diaphragms supported by steel beams, interior steel columns, perimeter reinforced masonry shear walls, and precast vertical and battered concrete piles. A two-story Pop-Up is located between the two wings. The Pop-Up consists of cast-in-place concrete slabs and steel braced frames at the upper story, and reinforced concrete shear walls at the lower story.

In 1984, as part of project SD152, a one-story steel moment frame structure with a concrete-filled metal deck and precast vertical and battered concrete piles was added along the west side of the original Lab.

In 1988, as part of project SD176, the original Lab and Admin wings were seismically retrofitted. The retrofit work addressed deficiencies in the out-of-plane masonry wall anchorage throughout the original building. The steel braces at the upper-story of the Pop-Up structure were replaced with stronger braces. The work also included eliminating the seismic gap between the roof of the West Lab addition (project SD152) and the original Lab. The roof of the West Lab addition was tied into the walls of the original Lab to address the out-of-plane anchorage deficiencies in the original Lab. Deficiencies in the steel moment frame of the West Lab addition (project SD152) were addressed by adding two bays of steel braced frames along the west side of the West Lab addition.

In 1991, as part of project SD185, the south side of the original Admin building and the north side of the original Lab were expanded. Both additions are seismically-separate from the main building and consist of steel moment frames with concrete-filled metal deck roofs and vertical precast concrete piles. As part of the SD185 project, two light frame greenhouse-like structures were added. These structures consist of a lunch room extension located on the south side of the original lab building and the lab corridor addition located on the east side of the original lab building as shown in Figure 1.

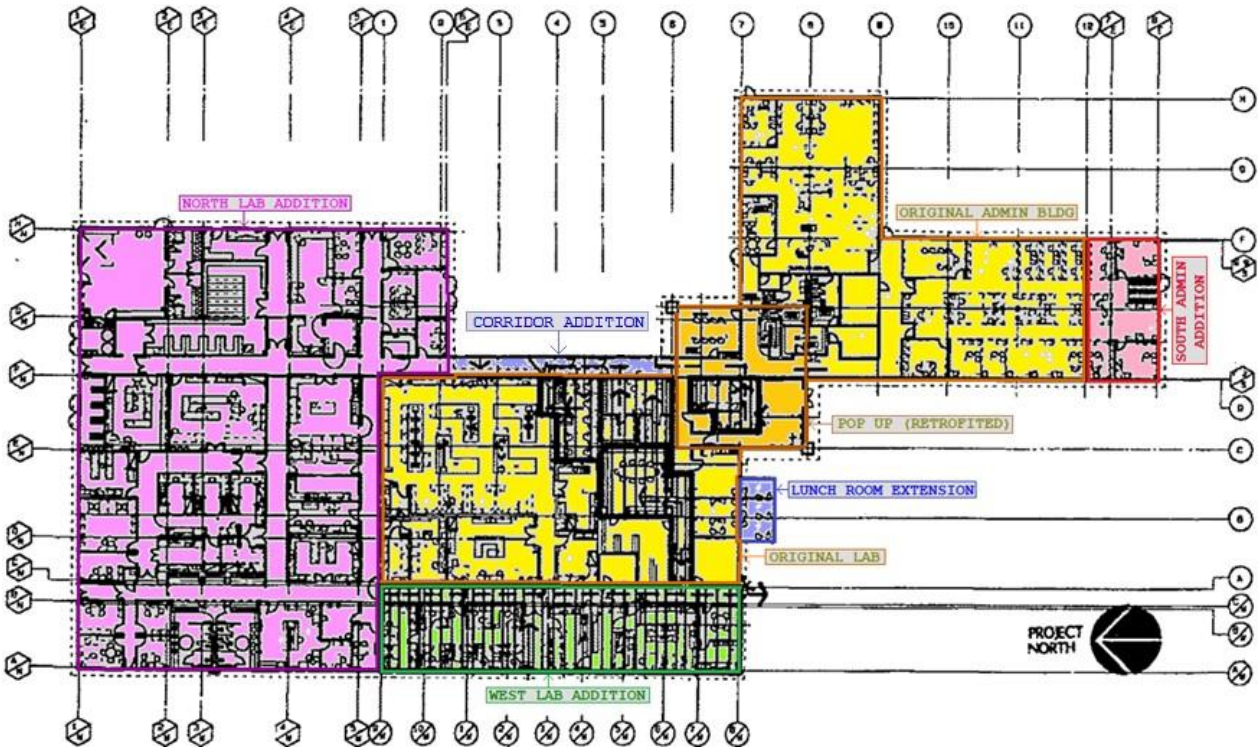

Figure 1: Admin/Lab Buildings – Plan View Showing the Building Parts

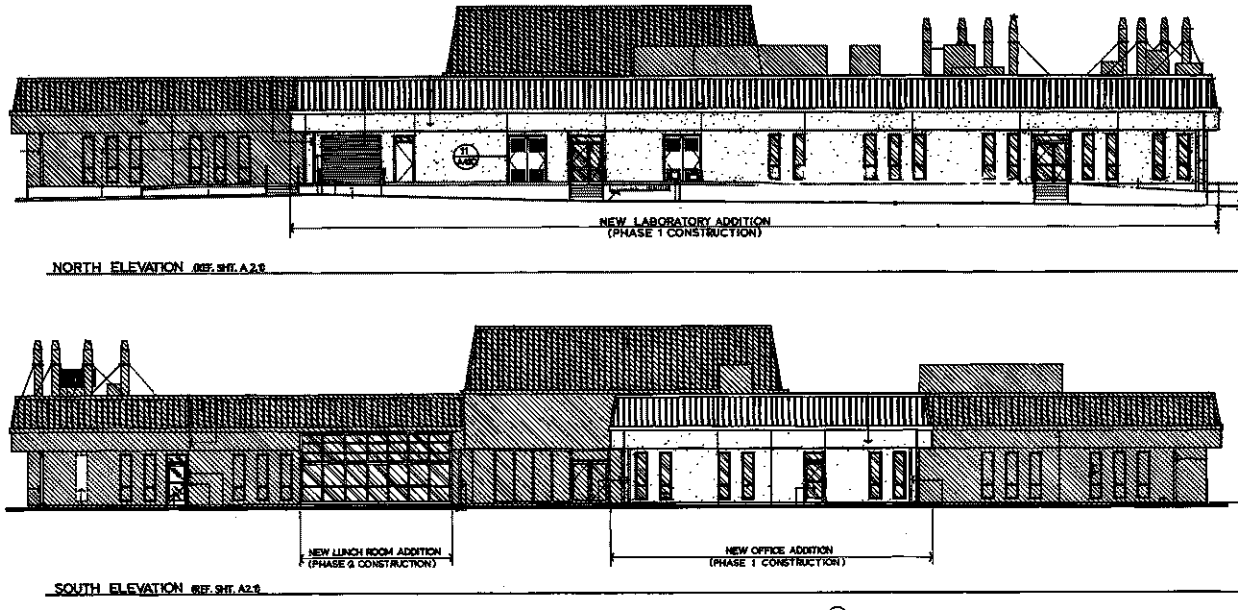

Figure 2: Admin/Lab Buildings – North (top) and South (bottom) Elevations

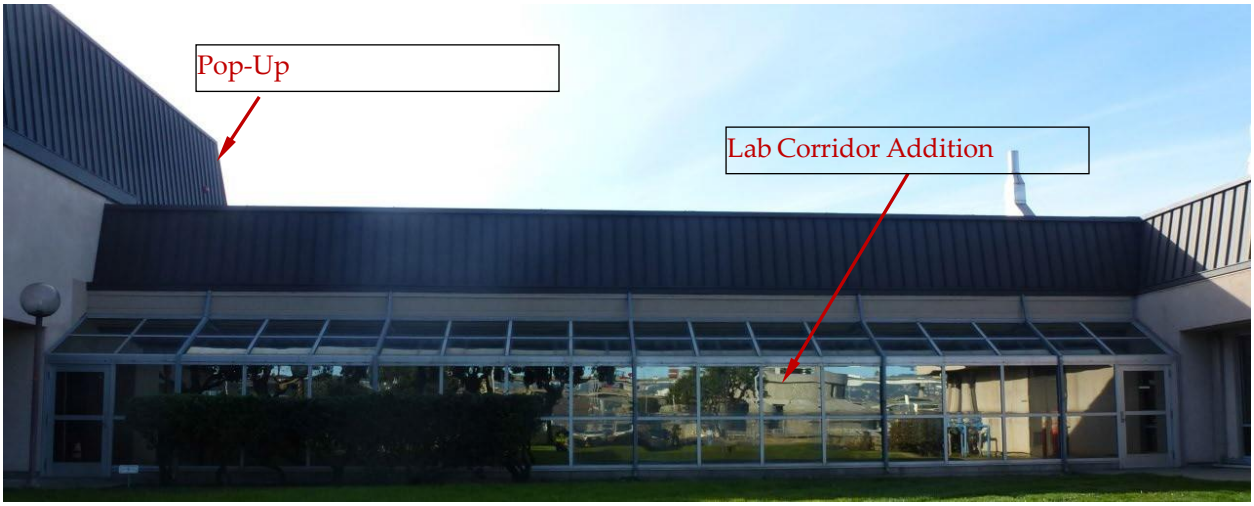

Figure 3: The Original Lab Building, Corridor Addition and the Pop-Up – View from East

Figure 4: The Original Admin Building and Addition (left) – View from East

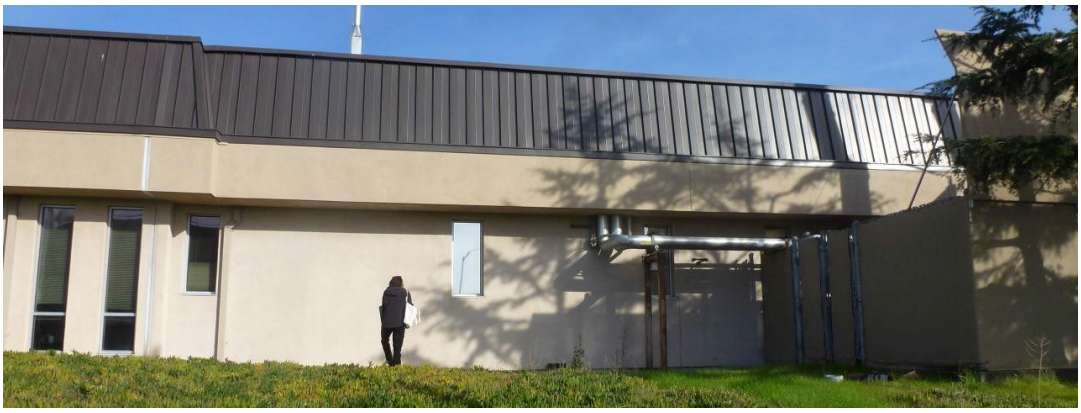

Figure 5: West Lab Addition – View from West

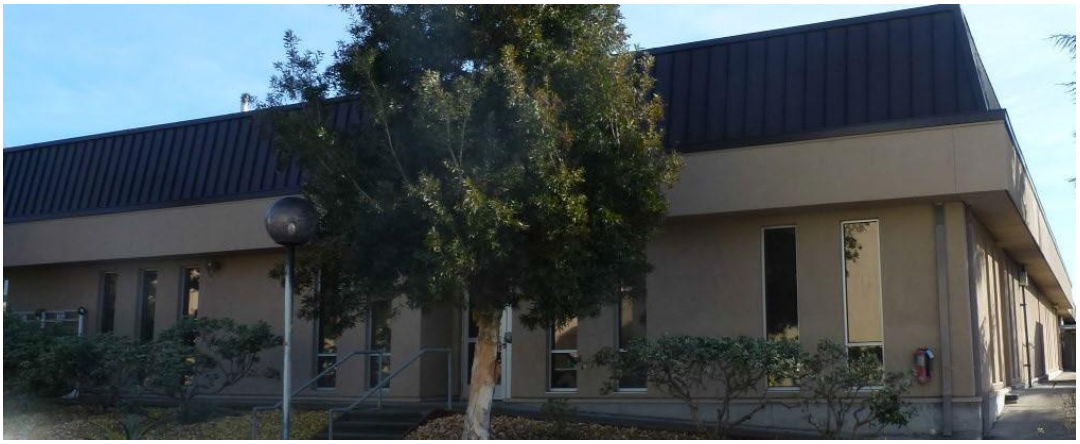

Figure 6: North Lab Addition – Northwestern Corner

Figure 7: The Two-Story Pop-Up Portion – View from South

2.3 GRAVITY LOAD RESISTING SYSTEM

2.3.1 Original Structure

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns and the exterior load bearing concrete block masonry walls. The columns and the walls are supported on grade beams, pile caps and piles. The two-story Pop-Up portion has reinforced concrete slabs supported on steel girders and beams. The steel girders transfer their loads to steel columns and two massive concrete columns at the northeastern and southwestern corners. Each column is 4-foot square in cross-section supported on a pile cap with 16 piles.

2.3.2 West Lab Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams with piles.

2.3.3 North Lab Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams, pile caps and piles.

2.3.4 South Admin Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams with piles.

2.4 FOUNDATION SYSTEM

The Admin and Lab building complex consists of multiples seismically independent structures separated by expansion joints. Each individual part is described below.

2.4.1 Original Structure

The foundation system of the original building (shown in Figure 8) consists of foundation beams, pile caps and 219 vertical and batter piles. Pile details are shown in Figure 9. It is important to note that almost all batter piles are oriented in the northeast-southwest plane, and there is very little batter action in the northwest-southeast direction.

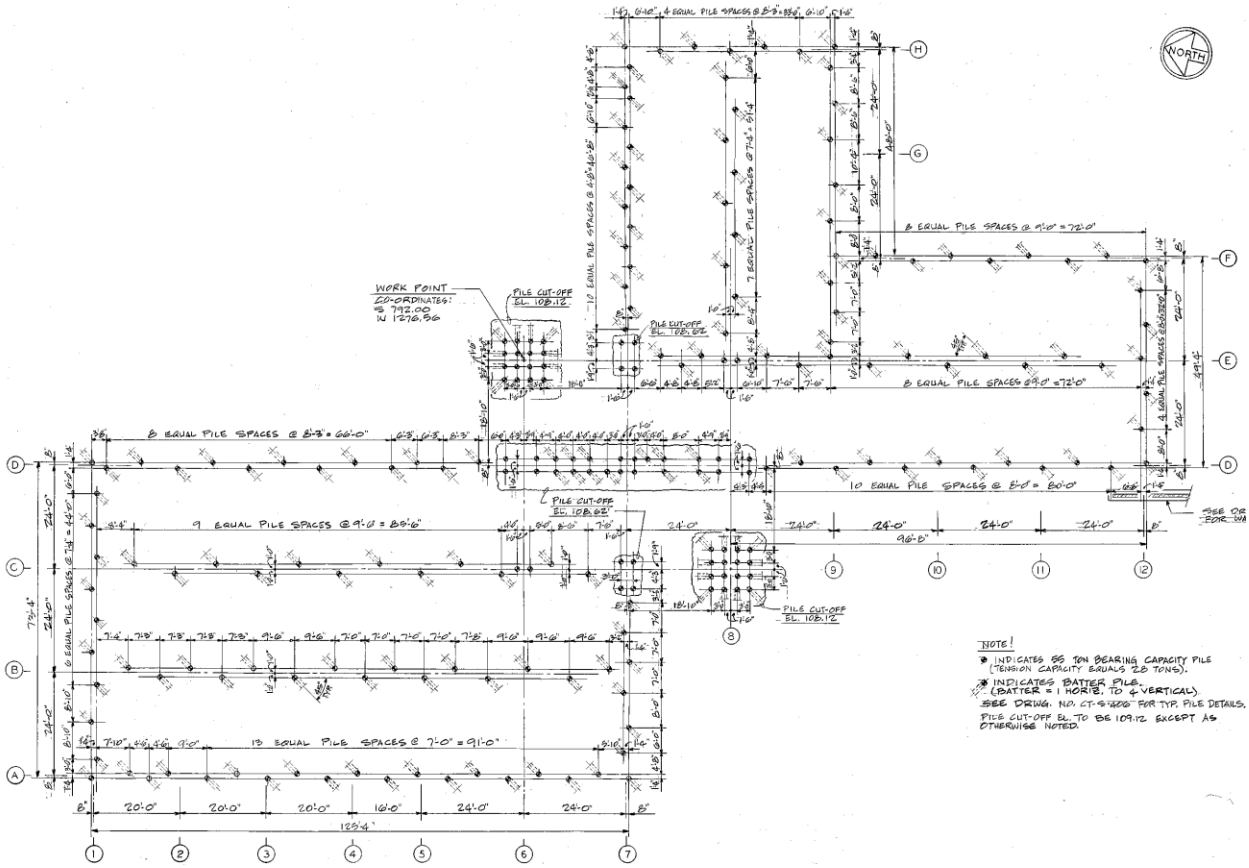

Figure 8: Foundation Plan of the Original Structure

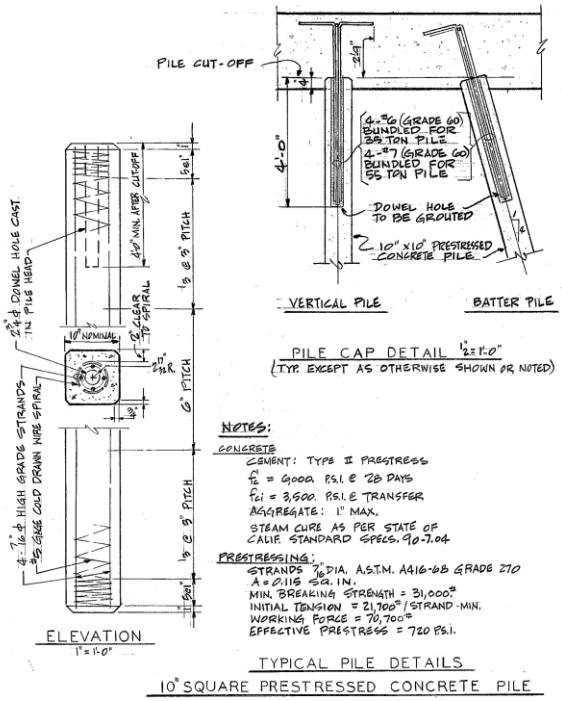

Figure 9: Typical Pile Details for the Original Structure

2.4.2 West Lab Addition

The foundation system of the West Lab addition (shown in Figure 10) consists of foundation grade beams and 42 twelve-inch square precast vertical and batter piles. The foundation beams of the West Lab addition are decoupled from the original building foundations.

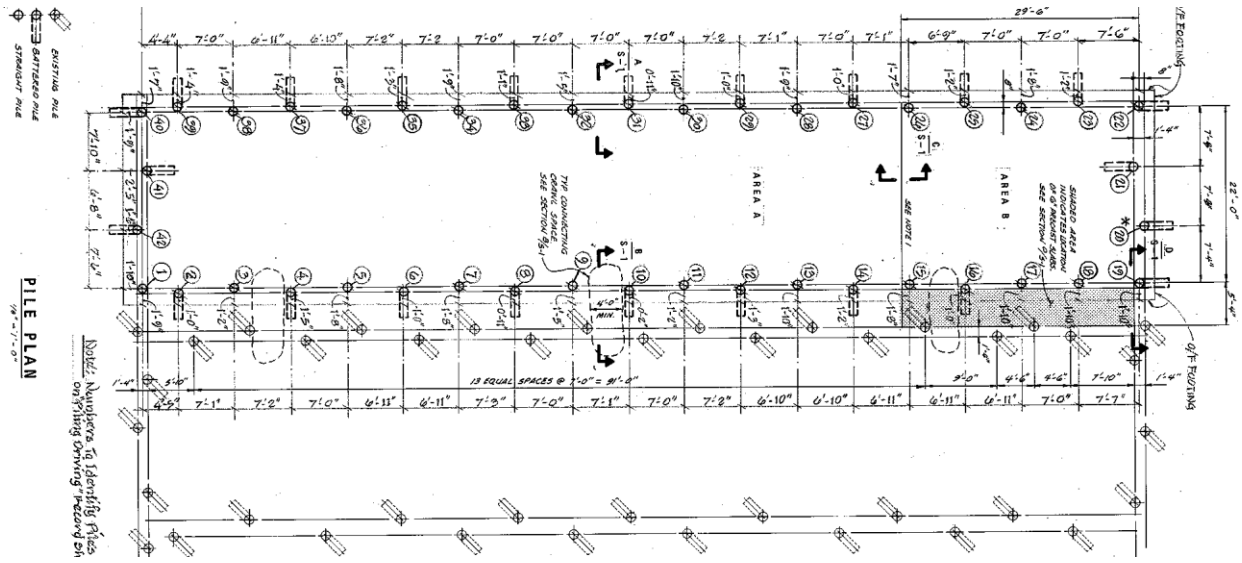

Figure 10: Foundation Plan of the West Lab Addition

2.4.3 North Lab Addition

The foundation system of the building consists of foundation beams, pile caps and 148 twelve-inch square precast vertical piles. The foundation beams of the North Lab addition are decoupled from the original building foundations (as shown in Figure 11 left).

2.4.4 South Admin Addition

The foundation system of the structure consists of foundation beams and 14 twelve-inch square precast vertical piles. The foundation beams of the South Admin addition are decoupled from the original building foundations (as shown in Figure 11 right).

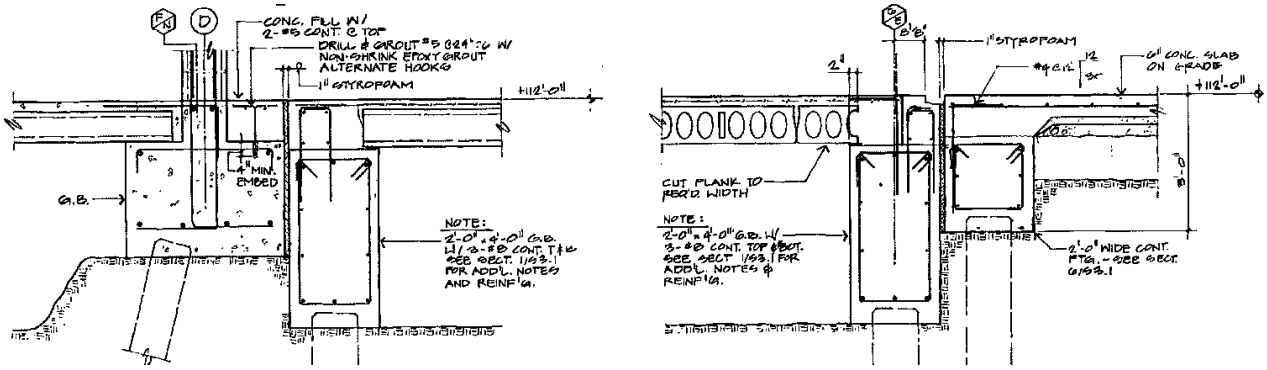

Figure 11: Foundation Details of the Lab and Admin Additions

2.5 LATERAL LOAD RESISTING SYSTEM

The Admin and Lab building complex consists of multiples seismically independent structures separated by expansion joints. Each individual part is described below.

2.5.1 Original Structure

The original structure, designed and constructed in 1974, consists of the original Admin building, the original Lab building and the Pop-Up structure.

The main lateral load resisting system of the Admin and Lab portions of the building consists of reinforced concrete floor and roof diaphragms and perimeter shear walls. The shear walls are reinforced concrete masonry units (CMU) with grout infill. The roof diaphragm is assumed to be concrete-filled as indicated on number of drawings. For example, the roofing detail at the roof to wall connection (taken from DWG CT-A-423) shows lightweight concrete fill for the roof diaphragm (Figure 12) shows. However, previously the roof diaphragm was described as non-concrete-filled, but additional information obtained from EBMUD confirms that the roof diaphragm is a concrete-filled metal deck.

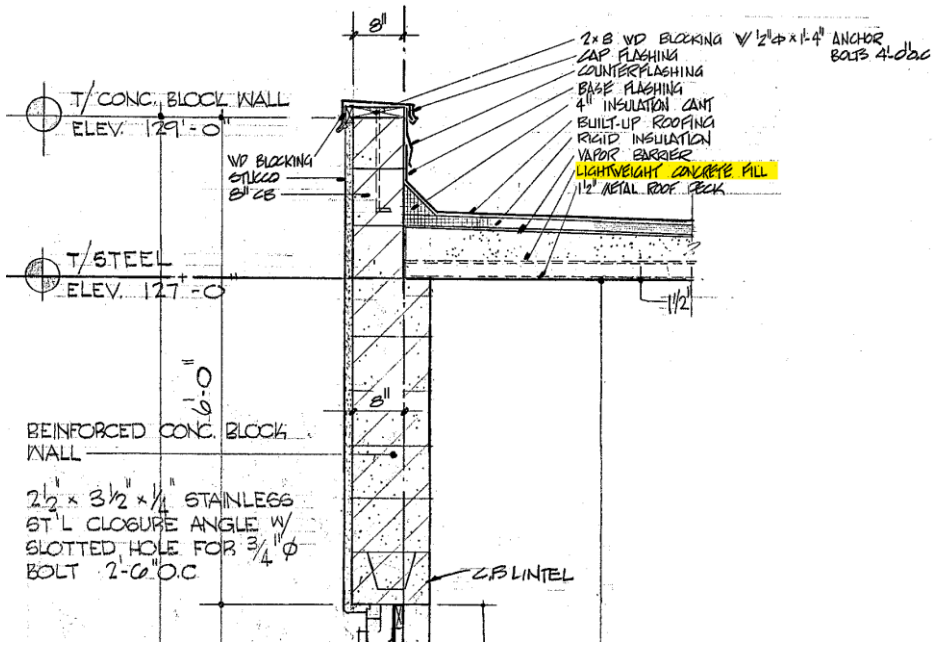

Figure 12: Original Building – Roofing Detail

The mid-level floor of the two-story Pop-Up structure is at the same elevation as the roof level of the Admin and Lab buildings and is part of a single floor diaphragm that connects all parts as one continuous structure. The mid-level floor of the Pop-Up structure has two massive (48-inch square) columns at the northeastern and southwestern corners. Two 12-inch by 66-inch shear walls in the north-south direction and two 12-inch by 54-inch shear walls in the east-west direction provide connection to the Admin and the Lab buildings. The plan view of connection is shown in Figure 13. The lateral load resisting system for the second floor of the Pop-Up consists of four steel braces, two in each direction. The steel braces are supported on the concrete piers and shear walls below.

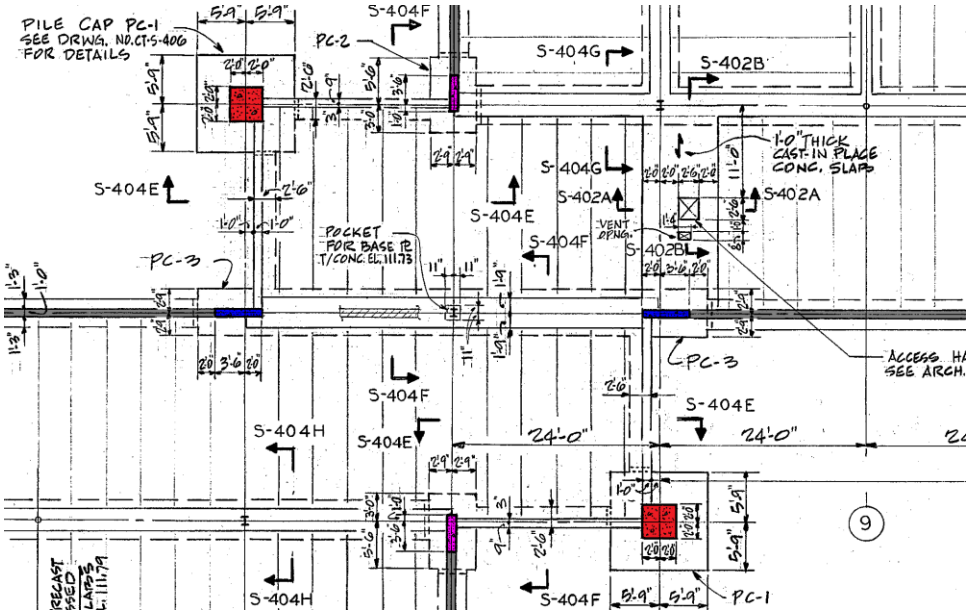

Figure 13: The Pop-Up Structure Connection to the Admin and Lab Buildings

2.5.2 West Lab Addition

The West Lab addition was originally designed and constructed in 1984 and is located on the west side of the original structure. The addition is seismically connected to the original structure.

The West Lab addition is a single-story steel moment and braced frame structure with a concrete-filled metal deck. The moment frames are located in the east-west direction. Two steel braces are provided along the west elevation. As part of the seismic retrofit project, the structure in the east-west direction was connected at the roof level to the original Lab building at two locations. Details of this connection are shown in Figure 14.

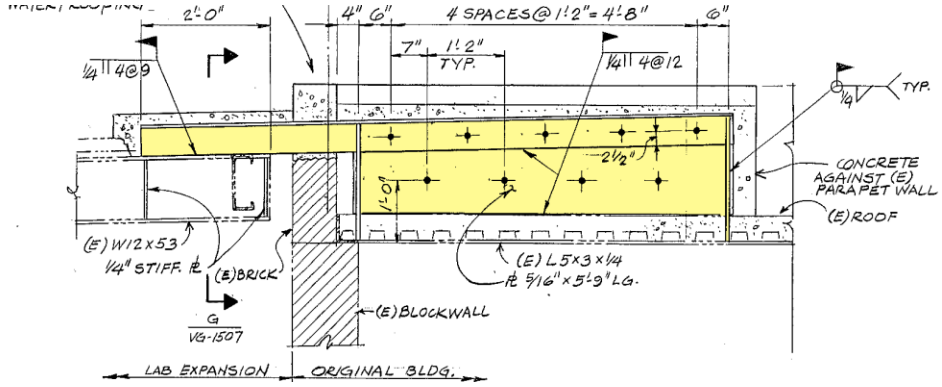

Figure 14: Connection of the West Lab Addition to the Original Lab Building

2.5.3 North Lab Addition

The North Lab addition is a single-story steel moment frame structure with a concrete-filled metal deck. The addition is located on the north side of the original Lab building. The structure is seismically independent from the rest of the building. A 4-inch seismic separation is provided between the North Lab addition and the original Lab building.

2.5.4 South Admin Addition

The South Admin addition is a single-story steel moment frame structure with a concrete-filled metal deck. The addition is located along the south side of the original Admin building. The structure is seismically independent from the rest of the building. A 4-inch seismic separation is provided between the addition and the original Admin building.

2.5.5 Lunch Room Extension

The lunch room extension is a light frame greenhouse-like structure located at the south portion of the original Lab building. While the extension itself does not significantly impact the seismic performance of the building, a portion of the original lab exterior wall was removed (Figure 15, right) to connect the extension to the rest of the building. This results in a potential vulnerability as the exterior masonry walls are load bearing element of the gravity system and are needed to support steel beams from the roof structure as shown in Figure 15 (left). Furthermore, a note on drawing DWG CT-S-413 states "the masonry walls are designed as shear walls and shall not be altered without the approval of the engineer". It is not clear if this note was followed prior to addition of the lunch room extension.

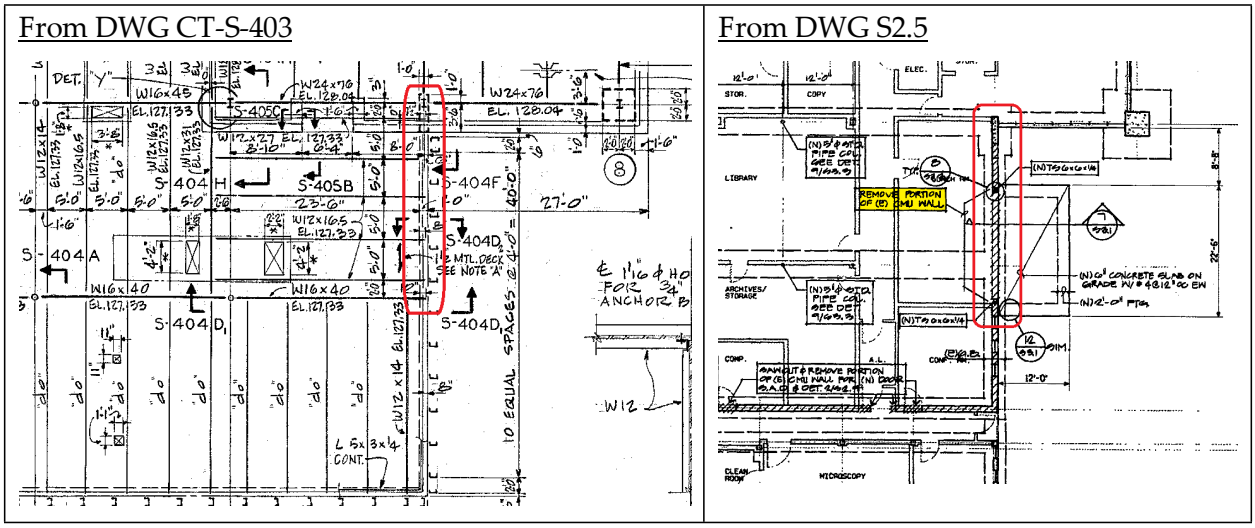

Figure 15: Lunch Room Extension

2.5.6 Lab Corridor Addition

The lab corridor addition is a light frame greenhouse-like structure located at the east side of the original Lab building. The glass wall (shown in Figure 16) sits on 3-foot wide spread footing foundation without piles. The addition does not significantly impact the seismic performance of the lab building, however, if subjected to a significant permanent ground deformation, the structure may separate from the lab building.

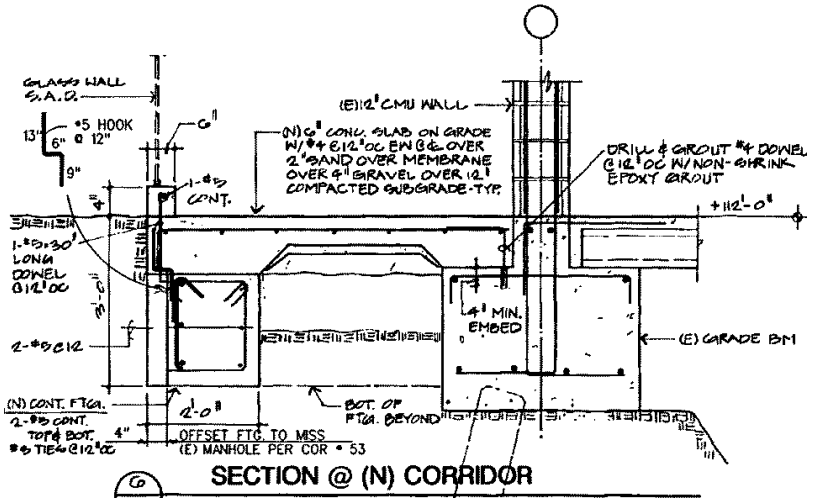

Figure 16: Lab Corridor Addition

7.0 IDENTIFIED VULNERABILITIES

This section presents the summary of the identified vulnerabilities.

7.1 ORIGINAL BUILDING AND WEST LAB ADDITION

The vulnerabilities of the above ground structure are shown in Figure 116.

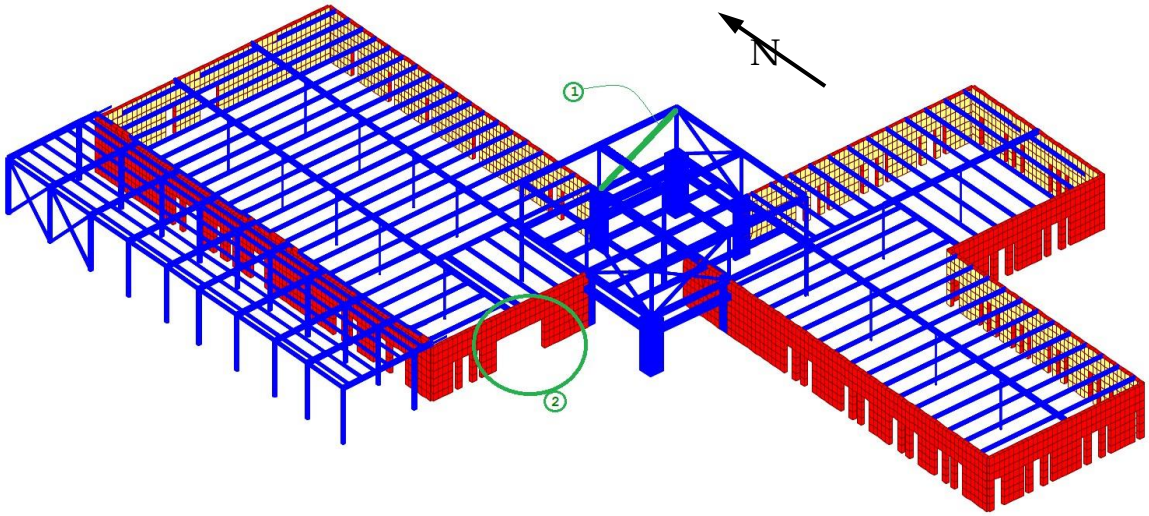

Figure 116: Original Building – Identified Vulnerabilities

7.1.1 Steel Elements around Single Brace at Pop-Up Structure

There are 4 steel braces at the second floor of the Pop-Up structure. Three of the braces are TS8x4x1/4 X-braces. The fourth brace is single diagonal TS7x7x5/16 shown as (1) on Figure 116. For the fixed base model, multiple steel members of the Pop-Up structure are overstressed with DCR exceeding the m-factor for LS (BSE-2E) and IO (BSE-1E). However, results from the flexible

base model show that the DCRs below the acceptance criteria for Risk Category IV. It is our judgement that the flexible base model is more representative of the building. If the building is assumed as Risk Category I & II, the results show that the building meets the acceptance criteria.

7.1.2 South Wall of the Original Lab Building

The lunch room extension is a light frame greenhouse-like structure located at the south portion of the original Lab building. While the extension itself does not significantly impact the seismic performance of the overall building, a portion of the original lab exterior wall was removed to connect the extension to the rest of the building shown as (2) on Figure 116. The available drawings do not show details of any strengthening of the wall prior to the removal of the existing wall piers to create access to the lunch room extension. It is recommended to confirm that no strengthening of the wall section was performed. Lack of any strengthening creates stress concentrations around the large opening. DCR for the wall in this area exceeds the m-factor for both the fixed base and the flexible base models and the building does not meet the acceptance criteria for Risk Category IV or that for Risk Category I & II.

7.1.3 Piles

The analysis shows that for the fixed base analysis case, the DCRs for lateral forces and/or bending moments are higher than the m-factor for both the BSE-1E and BSE-2E case. For the finite element model with flexible base, only the pile bending DCRs are slightly above the m-factors. Therefore, the piles do not meet the acceptance criteria for Risk Category IV. However, for the flexible base model, the piles meet the acceptance criteria for Risk Category I & II. It is our judgement that the flexible base model is more representative of the building.

7.1.4 Roof Diaphragm

For the analysis, the roof diaphragm is assumed to be concrete-filled metal deck as shown on a number of drawings. Previously the roof diaphragm was described as non-concrete-filled. Based on additional information obtained from EBMUD, the roof diaphragm is a concrete-filled metal deck. No additional vulnerabilities are identified for the roof diaphragm.

7.2 NORTH LAB ADDITION

The vulnerabilities of the North Lab addition are described below.

7.2.1 Steel Moment Frames

The finite element models show that most steel elements have DCRs below the m-factors and meet the acceptance criteria for Risk Category IV. However, for the fixed and flexible base finite element models, one beam (highlighted in Figure 117) shows DCR exceeding the m-factor for the BSE-1E case. Nevertheless, the North Lab addition meets the code-based acceptance criteria for Risk Category I & II.

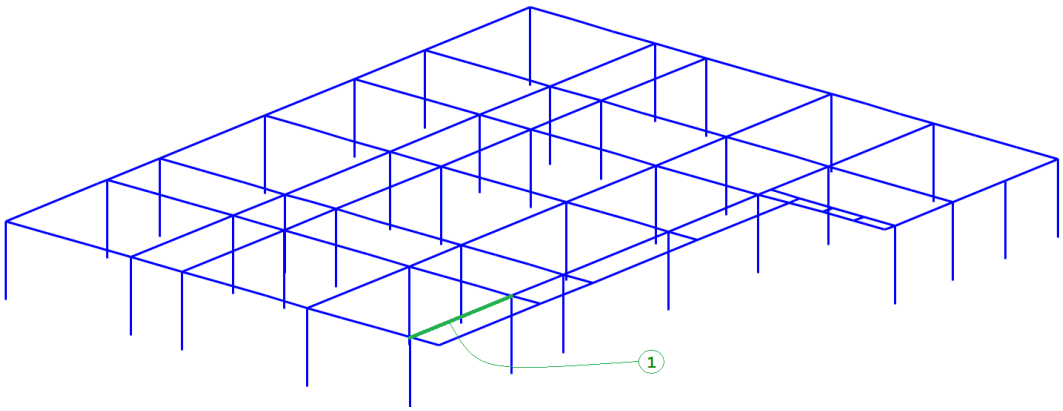

Figure 117: North Lab Addition – Identified Vulnerabilities

7.2.2 Steel Column to Foundation Connection

The base plate detail for the moment frame column connection to the foundation, shown in Figure 118, is inadequate to transfer bending moment from the column to the foundations. If the column base is considered pinned, the roof drifts will be unacceptable and the ponding between the

structures will be excessive. To address this vulnerability, the following options may be considered:

1. Structurally connect the North Lab Addition and the Original structure (similar to the connection of the West Lab Addition to the Original structure). However, due to the size of the North Lab Addition, such a retrofit may impact the overall structural response.
2. Add additional structural elements such as shear walls or braced frames to stiffen the North Lab Addition.
3. Retrofit the column base plate connections (at each column base) to fully develop the imposed moments and forces from the moment resisting frames.

Out of these three options, it is our opinion that Options 2 and 3 are less disruptive.

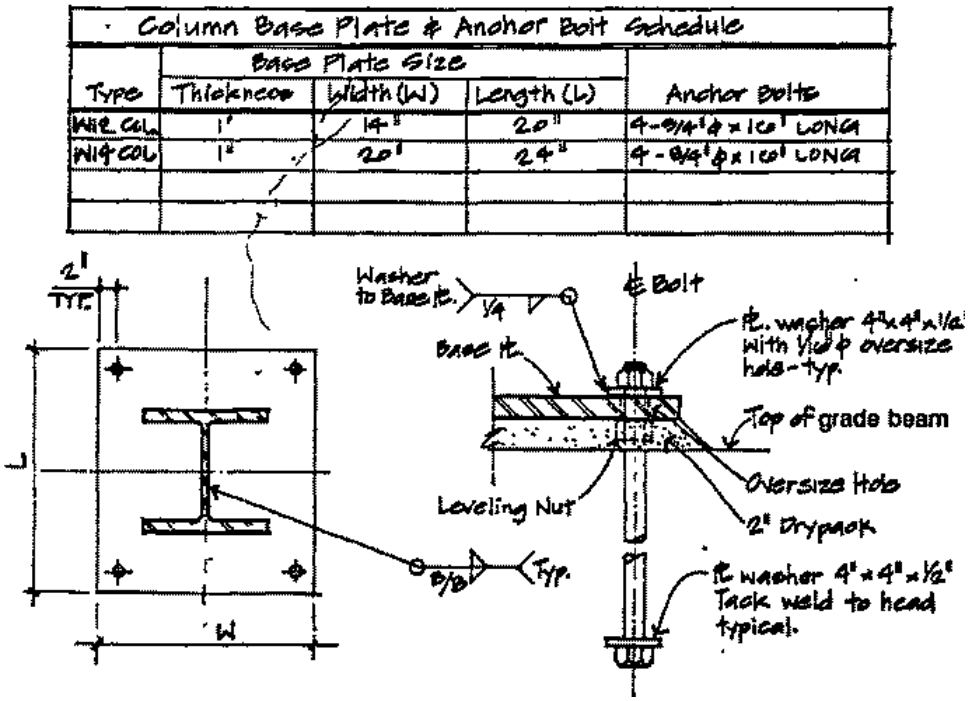

Figure 118: Base Plate and Anchor Bolt Detail

7.2.3 Piles

The analysis shows that for the fixed and flexible base analysis cases, the DCRs for bending moments are higher than the m-factor for both the BSE-1E and BSE-2E cases. Therefore, the piles do not meet the acceptance criteria for Risk Category IV. However, the piles meet the acceptance criteria for Risk Category I & II. It is our judgement that the flexible base model is more representative for the building.

7.2.4 Displacements at Roof Diaphragm

The BSE-2E displacements are greater than the seismic gap between the north lab addition and the original building. Pounding between the two structures is likely and potential localized damage at the impact areas.

7.3 SOUTH ADMIN ADDITION

The vulnerabilities of the South Admin addition are described below.

7.3.1 Steel Column to Foundation Connection

Similar to the North Lab addition, the base plate detail is not adequate to transfer the bending moment from the column to the foundations. The three retrofit option identified for the North Lab Addition are also feasible for the South Admin Addition; however, due to the relatively small footprint of the South Admin Addition, Option 1 may be the preferred option in this case.

7.3.2 Piles

The analysis shows that for the fixed base analysis case, DCRs for lateral forces and/or bending moments are higher than the m-factor for both the BSE-1E and BSE-2E cases. For the finite element model with flexible base, all DCRs are below the m-factors. For Risk Category I & II only the fixed base DCR for BSE-2E case is slightly above the m-factor. It is our judgement, that the flexible base model is more representative of the building. Therefore, the piles meet the acceptance criteria for Risk Category IV and Risk Category I & II.

EXHIBIT G

ENVIRONMENTAL, HEALTH, SAFETY AND SECURITY CHECKLIST (SAMPLE)

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 ☐

SAMPLE

Security Issues

Is the work being performed at a critical facility?	Yes ☐	No ☐	Unknown ☐
Will the facility be in-service during construction?	Yes ☐	No ☐	Unknown ☐
Are Contractor badges required during construction per the Construction Security Guidelines?	Yes ☐	No ☐	Unknown ☐
Will guard services be required during construction?	Yes ☐	No ☐	Unknown ☐
Have physical security improvements been integrated into design in accordance with Physical Security Design Guide: • Fencing and or walls • Physical barriers (bollards / K rail) • Security keypads (C*Cure) and locks • Video security systems • Contact alarms	Yes ☐	No ☐	Unknown ☐

Environmental Issues

Is an environmental site assessment (phase I/phase II) required for the project?	Yes ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
Will any soil be off hauled or reused from this project?	Yes ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
Will any underground or aboveground tanks and/or associated piping be installed or removed during this project?	Yes ☐	No ☐	Unknown ☐
Will any work be done in or adjacent to a stream, lake, river, or other water body?	Yes ☐	No ☐	Unknown ☐

SAMPLE

Does the project contain potential for erosion impacts to nearby water bodies during construction?	Yes ☐	No ☐	Unknown ☐
Will monitoring wells be installed or removed under this project?	Yes ☐	No ☐	Unknown ☐
Will construction result in land disturbance of one acre or more?	Yes ☐	No ☐	Unknown ☐
Is there any known or suspected environmental (soil, soil gas or groundwater) contamination at or adjacent to this site?	Yes ☐	No ☐	Unknown ☐
Are there any reports/ information available related to site history and potential contamination onsite?	Yes ☐	No ☐	Unknown ☐
Is the project located adjacent to a freeway or highway?	Yes ☐	No ☐	Unknown ☐
Is there residential property or sensitive receptors (e.g., schools, hospitals, nursing homes) adjacent to the site?	Yes ☐	No ☐	Unknown ☐
Has a CEQA document been filed for the project?	Yes ☐	No ☐	Unknown ☐
Will the project use architectural coatings or other VOC containing compounds, including aerosols, during construction?	Yes ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
Is the contractor planning to use portable generators to supply power during construction?	Yes ☐	No ☐	Unknown ☐
Does the project require vegetation management or pesticide application?	Yes ☐	No ☐	Unknown ☐
For wastewater projects: will this work be done on the west end property?	Yes ☐	No ☐	Unknown ☐
Post-construction Questions			
Will hazardous substances (includes both hazardous materials and hazardous wastes) be stored at the newly constructed facility?	Yes ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐
Will the newly constructed facility discharge water, wash water or wastewater (other than sanitary waste) to a sanitary sewer?	Yes ☐	No ☐	Unknown ☐
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 ☐	No ☐	Unknown ☐

SAMPLE

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 ☐ No ☐ Unknown ☐

SAMPLE