

INVITATION FOR BID

Medium Voltage Switchgear (SS-C-48)

17-18/20



PORT OF OAKLAND

PURCHASING DEPARTMENT
530 WATER STREET
OAKLAND, CA 94607



INVITATION FOR BID

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

The Port of Oakland ("Port"), Oakland, California, through the Purchasing Department, is hereby soliciting competitive bids for the above-mentioned project. The successful bidder ("Bidder") will be required to furnish all labor, material, equipment, supplies, applicable taxes, insurance, bonding (if applicable), permits, and licenses to complete this project.

General Bid Information

Bid Title	Medium Voltage Switchgear (SS-C-48)
Bid Type	Goods and Services
Bid Number	17-18/20
Bid Issued	November 17, 2017
Issuing Department	Project Design & Delivery Maritime – E/M
Optional Pre-bid Meeting	December 6, 2017 at 10:00 a.m. Port of Oakland, 530 Water Street, Oakland, CA 94607 (2 nd Floor Courtyard Conference Room)
Scheduled Publication Date	November 17, 2017
Bid Due Date	December 22, 2017 until 2:00 p.m. Bids received after the time and date stated shall be returned unopened to the Bidder. All timely submitted Bids are opened at the Submittal Address 15 minutes after they are due.

Instructions for Submitting Bids

Submittal Address	Port of Oakland—(Second Floor, Purchasing Department) Attn: Nickulaus Sioson 530 Water Street Oakland, CA 94607
Submittal Copies	One (1) Original
Submittal Envelope Requirements	Bids must be <u>sealed</u> and have the following information <u>clearly marked</u> and visible on the outside of the envelope: <ul style="list-style-type: none"> • Bid Number and Title • Name of Your Company • Address • Phone Number
Late Submittals	Bids received after the time and date stated in the Bid Due Date section shall be returned unopened to the Bidder.

How to Obtain Bid Documents

Bid documents may be obtained from the location(s) indicated in the table below:

Location	Address
Physical Location	Port of Oakland Purchasing Department 530 Water Street Oakland, CA 94607 Monday through Friday 9:00 AM to 4:00 PM (510) 627-1140
Website	http://www.portofoakland.com/business/bids-rfps/ Or navigate to the Port of Oakland's main website at: http://www.portofoakland.com/ , then click on "Bids/RFPs" from the banner on the top of the page, and then scroll down to download the Bid.

Questions about the Bid or Request for Information

Questions and or Requests for Information (RFI) must be submitted in writing and can be submitted by fax or email as follows:

Primary Contact	Nickulaus Sioson Fax: (510) 893-2812 Email: nsioson@portoakland.com
Question/RFI Due Date	December 8, 2017 until 4:00 p.m. Please submit questions as soon as possible. No questions regarding the specifications will be responded to after the above date. All pertinent questions will be responded to and answered in writing no later than the Response Date listed below.
Response Date	December 13, 2017 All pertinent questions will be responded to via addendum faxed (or emailed) to all prospective Bidders and placed on the Port's website. Bidders who did not receive a copy of the addendum should download it from the Port's website. See the "How to Obtain Bid Documents" section for our web address. All addenda must be acknowledged on the Bid Form.

Full Opportunity

The Port's policy prohibits discrimination or preferential treatment because of race, color, religion, sex, national origin, ancestry, age (over 40), physical or mental disability, cancer-related medical condition, a known genetic pre-disposition to a disease or disorder, veteran status, marital status, or sexual orientation. It is the policy of the Port of Oakland to encourage and facilitate full and equitable opportunities for small local businesses to participate in its contracts for the provision of goods and services. It is further the Port's policy that no discrimination shall be permitted in small local business participation in Port contracts or in the subcontracting of Port contracts. The successful Bidder shall comply with the Port's Non-Discrimination and Small Local Business Utilization Policy.

Title VI Solicitation Notice: The Port of Oakland, in accordance with the provisions of Title VI of the

Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The Port reserves the right to reject any or all Bids, to waive any irregularities or informalities not affected by law, to evaluate the Bids submitted, and to award the Contract (or Purchase Order) according to the Bid which best serves the interests of the Port.

John Banisadr, Purchasing Manager

Attachments:

Title		Must Be Returned with Your Bid
1	Instruction to Bidders	No
2	Bid Form	Yes
3	Standard Purchase Order Terms and Conditions	No
4	Supplier Insurance Requirements	No
5	Non-Collusion Declaration	Yes
6	City of Oakland City Charter §728 Living Wage Information A. Employer Self-Evaluation for Port of Oakland Living Wage B. Certificate of Compliance—Living Wage	No (Required after award.)
7	Statement of Living Wage Requirements	Yes
8	Statement of Equal Employment Opportunity	Yes
9	Bid Bond	Yes, or a Cashier's Check
10	Performance Bond	(Required after award.)
11	Detail Bid Form	Yes

Enclosures

Title	
A	Product Specification
B	Special Provisions
C	AA-4221 Plans
D	Section 16342 Medium Voltage Metal-Clad Switchgear
E	Section 16343 Medium Load Interrupter Switchgear
F	Section 16195 Electrical Identification

**Bid Submission:**

The submission of a Bid shall be considered conclusive evidence that the Bidder has fully investigated and understands all conditions related to the Bid. The Bidder has read and become familiar with all of the Bid Documents, Attachments, Enclosures, and any Contract or Agreements. No claim for adjustment of the provisions of the Agreement shall be honored on the grounds that the Bidder was not fully informed as to its terms or any of these conditions. No verbal interpretation provided to any Bidder as to the meaning or consequence of any portion of the Bid, the Bid Documents or the Contract or Agreement shall be considered binding on the Port. No Bids shall receive consideration by the Port unless made in accordance with the following instructions:

1. **Port's Legal Name and Jurisdiction:** The Port of Oakland (the "Port") is legally known as the **City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners**. The Port is an independent department of the City of Oakland. The Port has exclusive control and management of all Port facilities and properties. Port facilities and properties consist of marine terminals, a railway intermodal terminal and container storage areas (collectively, the "Seaport"); the Oakland International Airport (the "Airport"); and commercial and industrial land and properties (collectively, "Commercial Real Estate"); and other recreational land, other land, undeveloped land, and water areas, all located in Oakland, CA. The Port issues Purchase Orders under the name Port of Oakland.
2. **Definition of Bidder:** The terms "Bidder", "Consultant", "Contractor", "Respondent", "Seller", "Supplier", and "Vendor" whenever appearing in this Invitation for Bid or any attachments, are used interchangeably to refer to the company or firm submitting a Bid in response to this Invitation for Bid.
3. **Deadline for Receipt of Bids and Multiple Bids:** Bids must be sealed and delivered to the location listed in the Invitation to Bid no later than the time specified in the invitation. The Port will place a clock ("Clock") in a conspicuous location at the place designated for submittal of Bids. For purposes of determining the time that a Bid is submitted, the Clock shall be controlling. The Port suggests that Bids be hand delivered in order to ensure their timely receipt. Any Bids received after the time stated shall not be opened and shall be returned, sealed, to the Bidder. No person, Bidder, firm, or corporation shall be allowed to make or file or be interested in more than one Bid unless alternate Bids are specifically called for. A person, firm, or corporation that has submitted a sub-proposal to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or make a Prime Bid.
4. **Bidder's Conference:** If applicable, a mandatory bidder's conference (Pre-bid Meeting) will be held on the date specified in the Invitation for Bid, for the purpose of acquainting all prospective Bidders with the bid documents. It is imperative that all prospective Bidders attend this conference. The Pre-bid Meeting is mandatory (when indicated) for any party submitting a Bid. If a Bidder fails to attend the Pre-bid Meeting, any Bid submitted by that Bidder will be rejected and returned unopened by the Port. Following this meeting, a site review may be conducted to acquaint Bidders with the site.
5. **Requests for Information:** Any questions relative to the Bid should be in writing and directed to the designee specified in the Invitation for Bid and by the deadline for receipt of questions.
6. **Bid Information:** The information contained in this Bid is provided for the convenience of the Bidders. The Port does not represent or warrant the accuracy of any financial or statistical information contained in this Bid. In addition, any information contained in any other documents issued by the Port, about the Port, may only be relied upon by a Bidder at its sole risk. It is the responsibility of the Bidder and other interested parties to assure

themselves that the information in this Bid packet is accurate and complete. The Port and the Board of Port Commissioners, and its employees and advisors, will have no liability arising out of the inaccuracy of any such information.

7. Bid Forms: Bids must be made on forms provided by the Port, unless otherwise specified. All items on the form should be filled out. Numbers should be stated in figures and written, and the signatures of all individuals must be in long hand. The completed form should be without interlineations, alterations, or erasures. Discrepancies between multiplication of units of work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of numerals and the correct sum thereof will be resolved in favor of the correct sum. In case of conflict between words and numerals, the words shall govern.
8. Execution of Forms: Each Bid must give the full business address of the Bidder and must be signed by the Bidder with his or her usual signature. Bids by partnerships must furnish the full names of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters. Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind the corporation in this matter. The name of each person signing shall also be typed or printed below the signature. When requested by the Port, satisfactory evidence of the authority of the officer signing on behalf of the corporation or partnership shall be furnished. A Bidder's failure to properly sign required forms may result in rejection of the Bid. When applicable, Bids must include the Bidder's California State Contractor's license number and expiration date.
9. Joint Venture Agreements: Any Bidder that is a Joint Venture shall include, as part of its Bid, a copy of the Bidder's Joint Venture Agreement, executed and in force, and the Joint Venture agreement may not be modified after the submission to the Port, prior to selection of the Bidder by the Port or thereafter without the written consent of the Port. Any Joint Venture acknowledges that each of the partners of the joint venture is jointly and severally liable under this Agreement, and has provided the Port with a true and accurate copy of the Bidder's Joint Venture Agreement.
10. Bid Bond/Bid Security: If this box ☒ is checked, a Bid Security (or Bid Bond) is required with your Bid. The Bid should be accompanied by a Cashier's Check or Bidder's Bond for an amount not less than ten percent (10%) of the Total Bid Price. The cashier's check shall be made payable to the "Port of Oakland" or Bid Bond shall be made payable to the "City of Oakland, a Municipal Corporation Acting by and through its Board of Port Commissioners ("Port")". The Bid Bond accompanying the Bid shall be secured by an admitted surety company, licensed in the State of California, satisfactory to the Port. The Cashier's Check or Bond shall be given as a guarantee that the Bidder will enter into the Contract (or Purchase Order) if awarded the work, and in the case of refusal or failure to enter into the Contract (or Purchase Order) within twenty (20) calendar days after notification of the award of the Contract (or Purchase Order), the Port shall have the right to award to another Bidder. If the Bidder fails or refuses to timely enter into the Contract (or Purchase Order), the Port reserves the right to declare the Bid Bond forfeited and to pursue all other remedies in law or equity relating to such breach including, but not limited to, seeking recovery of damages for Breach of Contract. Failure to provide Bid Security, or Bid Security in the proper amount, will result in rejection of the Bid.
11. Withdrawal of Bid: Bids may be withdrawn by the Bidders prior to the time fixed for the opening of Bids, but may not be withdrawn after the opening of Bids.
12. Responsible Bidder: A Responsible Bidder is defined as a Bidder who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity, and experience to satisfactorily perform the work or provide the goods. The Port may conduct such investigation as the Port deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders. The Port shall have the right to communicate directly with Bidder's surety regarding Bidder's guaranty.

The Port will be the sole determinate of whether a Bidder is considered a Responsible Bidder.

13. Evidence of Responsibility: Upon the request of the Port, a Bidder shall submit promptly to the Port satisfactory evidence showing the Bidder's financial resources, the Bidder's experience in the type of work being required (or goods needed) by the Port, the Bidder's organization and workforce available for the performance of the work and any other required evidence of the Bidder's qualifications to perform the proposed work or supply of goods. The Port may consider such evidence before making its decision awarding a Contract (or Purchase Order). Failure to submit evidence of a Bidder's responsibility to perform the proposed work (or goods needed) may result in rejection of the Bid. The Port may check any client reference provided by the Bidder to determine if the Bidder has the experience necessary to provide the goods or perform the services, and to determine the lowest responsive, responsible Bidder.
14. Addenda: Any addenda issued during the time of bidding shall become a part of the drawings and specifications issued to Bidders for the preparation of their Bids, and shall constitute a part of the Contract Documents. All addenda shall be numbered and dated and shall be acknowledged by the Bidder on the Bid Form. No addendum will be issued on such requests received later than five (5) calendar days before the scheduled opening of the Bids.
15. Minor Informalities, Rejection of Bids and Award of Contract: The Port reserves the right to waive any non-substantial or immaterial irregularities in the Bid and the right to accept or reject any and all Bids, or to accept or reject any portion or combination thereof, or award on the basis of Bid Elements or Total Bid Price, when to do so is in its own best interest. If an award is made, the Port will recommend a Contract (or Purchase Order) be awarded within sixty (60) calendar days after opening of Bids to the lowest responsive, responsible Bidder complying with the requirements of the Contract Documents, subject to the Board of Port Commissioner's approval (if required). The time for awarding the Contract (or Purchase Order) may be extended by the Port with the consent of the lowest responsible Bidder. If the Port does not recommend a Contract (or a Purchase Order) to be awarded to the lowest responsive, responsible Bidder, then the Bid will be cancelled.
16. Action by the Board of Port Commissioners: If action by the Board of Port Commissioners is required, the Board of Port Commissioners may approve or reject the Port's recommendation for award with the lowest responsive responsible Bidder, or may reject all Bids. If all Bids are rejected, the Board of Port Commissioners may direct staff to negotiate with any Bidder or call for new Bids.
17. Performance Bond: If this box ☒ is checked and your Bid exceeds \$25,000, a Performance Bond is required prior to issuance of a Contract (or Purchase Order). The successful Bidder shall be required to submit the Performance Bond as specified in the Contract Documents. The required Bond shall be calculated on the maximum Total Bid Price. A Bidder's failure to submit the Bond requested shall result in rejection of their Bid and forfeit of their Bid Security.
18. Execution of Contract: The successful Bidder shall, within twenty (20) calendar days of Notice of Award of the contract, sign and deliver to the Port, without exception, the executed Port Contract (or Purchase Order) along with the Bonds and any evidence of insurance required by the Contract Documents. In the event the Bidder to whom an award is made fails or refuses to execute the Contract (or Purchase Order) within twenty (20) calendar days from the date of receiving notification that the Contract (or Purchase Order) has been awarded to the Bidder, or fails to provide the required bond and evidence of insurance, the Port may declare the Bidder's Bid Security or bond forfeited as damages caused by the failure of the Bidder to enter into the Contract (or Purchase Order), and may award the work to the next lowest responsive, responsible Bidder, or may reject all Bids and, at its sole discretion, call for new Bids.
19. Form of Contract: If this box ☐ is checked, the Bidder selected by the Port will be required to execute, without exception, a Contract in form and substance substantially

similar to that included in the Bidding package. The Contract and other documents are subject to the approval of the Port and its legal counsel.

20. Standard Purchase Order Terms and Conditions: The Port's Standard Purchase Order Terms and Conditions apply to all purchases (unless specifically noted in the Bid package). A copy of the Port's Standard Purchase Order Terms and Conditions is included in this Bid package. By submitting a Bid, Bidder agrees to the Port's Standard Purchase Order Terms and Conditions.
21. Drawings and Specifications: If this box ☐ is checked, each Bidder shall be required to return to the Port all drawings and specifications in an un-mutilated condition and without any marks or annotations. All drawings, specifications and other documents used or prepared during the project shall be the exclusive property of the Port.
22. Taxes: Taxes shall be included in the Total Bid Price at the current Alameda County uniform local sales and use tax rate.
23. Bid Exceptions: All exceptions to the plans and specifications which are taken in response to this Bid must be stated clearly. The taking of Bid exceptions or providing false, incomplete or unresponsive statements may result in the disqualification of the Bid.
24. Discounts: Any discounts which the Bidder desires to provide the Port must be stated clearly on the Bid Form itself so that the Port can calculate properly the net cost of the Bid. Offers of discounts or additional services not delineated on the Bid Form will not be considered by the Port in the determination of the lowest responsive, responsible Bidder.
25. Quantities: The quantities shown are approximate. The Port reserves the right to increase or decrease quantities as desired.
26. Prices: Bidders must quote prices Free on Board (F.O.B). Destination; the Port, unless otherwise noted. Prices should be stated in the units specified and Bidders should quote each item separately.
27. Samples: On request, samples of the products being supplied shall be furnished to the Port at no cost to the Port.
28. Special Brand Names: In describing any item, the use of a manufacturer or special brand, except in those instances where the product is designated to match others in use on a particular public improvement either completed or in the course of completion, does not restrict bidding to that manufacturer or special brand (unless specifically noted), but is intended only to indicate quality and type of item desired. Bidders may furnish any material, product, thing or service of comparable quality or utility. If a Bidder is requesting substitution of "or equal" item, the make and grade of the article on which the Bid is submitted must be stated in the Bid Form and illustrations and catalogue information submitted. The Port has the sole right to make all decisions on products and supplier selection of "or equal" substitutes.
29. Container Costs and Delivery: All costs for containers shall be borne by the Bidder. All products shall conform to the provisions set forth in the Federal, County, State, and City laws for their production, handling, processing and labeling. Packages shall be so constructed to ensure safe transportation to point of delivery.
30. Bid Negotiations: A Bid response to any specific item of this Bid Document with terms such as "negotiable", "will negotiate" or similar, will be considered as non-compliance with that specific term.
31. Purchases by Other Public Agencies, the Port, and Additional Quantities: Bidder agrees to extend identical prices and services under the same terms and conditions to other public agencies and the Port (known as "Piggybacking"). Other public agencies may piggyback on this contract for the goods/services and purchase directly from Bidder without additional competitive processes. Each participating agency will execute its own Contract with the Bidder for its requirement and payment will be made directly by the participating agency.

Following any initial purchase(s) by the Port, additional quantities of the goods/services listed herein, may be purchased to replace or supplement existing purchases.

32. Prevailing Law: In the event of any conflict or ambiguity between these instructions and State or Federal law or regulations, the latter shall prevail. Additionally, all equipment to be supplied or services to be performed under the Bid shall conform to all applicable requirements of Local, State and Federal laws, including, but not limited to, California Labor Code.
33. Governing Law and Venue: The Bid Documents, Specifications and related matters shall be governed by and construed in accordance with the laws of the State of California. Legal actions relating to the Bid Documents, Specifications and related matters shall only be brought in the Federal or State Courts of Alameda County, California, to which jurisdiction Bidder irrevocably submits.
34. Living Wage Policy: On March 5, 2002, the voters in the City of Oakland passed Measure I, adding to the City Charter Section 728 ("§728") entitled "Living Wage and Labor Standards at Port-assisted Businesses." §728 requires Port Aviation and Maritime businesses that meet specified minimum threshold requirements to pay all nonexempt employees a Living Wage rate established by City Ordinance and adjusted annually based on the Consumer Price Index for the San Francisco, Oakland and San Jose area. (See the enclosed §728 for the current living wage rates.) Specifically, §728 applies to Port contractors and financial assistance recipients with the Aviation or Maritime divisions that have contracts worth more than \$50,000 and that employ more than 20 employees who spend more than 25% of their time on Port-related work. §728 also provides covered employers with incentives to provide health benefits to employees, establishes a worker retention policy, requires covered employers to submit quarterly payroll reports and requires covered employers to allow Port representatives access to payroll records in order to monitor compliance and labor organization representatives access to workforces during non-work time and on non-work sites. Covered employers are responsible for complying with the provisions of §728 from the date the covered contract is entered into. When a Contract (or Purchase Order) is awarded, the Bidder will be required to fill out the following forms included in the Bid packet:
- Employer Self-Evaluation for Port of Oakland Living Wage Form
 - Certificate of Compliance—Living Wage

Do not include these forms with your Bid. Only after a Contract (or Purchase Order) is issued does the successful Bidder need to return these forms to the Social Responsibility Division. Bidders shall acknowledge the Port's Living Wage Policy and compliance by submitting the "Statement Living Wage Requirements" (included in the Bid packet) with their Bid.

For more information on the Living Wage Policy, see the enclosed forms or call Connie Ng-Wong in the Port of Oakland's Social Responsibility Division at (510) 627-1390.

35. Non-Discrimination Policy: The Port of Oakland prohibits discrimination or preferential treatment because of race, color, religion, sex, national origin, ancestry, age (over 40), physical or mental disability, cancer-related medical condition, a known genetic pre-disposition to a disease or disorder, veteran status, marital status, or sexual orientation. Each Bidder must adhere to the Port's Non-Discrimination Policy by providing the enclosed "Statement of Equal Employment Opportunity" with their Bid.

In addition, the Port has a Non-Discrimination and Small Local Business Utilization Policy to encourage the use of small and local business. The entire Non-Discrimination and Small Local Business Utilization Policy is available at:

http://www.portofoakland.com/files/PDF/responsibility/NDSLBP_00810.pdf

A copy of the Port-certified Small and Local Business Enterprises can also be downloaded at: <http://srd.portofoakland.com/>.

36. Examination of Work Site: If applicable, before submitting a Bid, Bidders shall visit the site of the proposed work and shall fully inform themselves of all conditions in and about the work site, the building or buildings, if any, and any work that may have been done thereon. However, no Bidder shall visit the site without prior authorization by the Port.
37. Licenses: Each Bidder, and their subcontractors, if any, must possess all appropriate and required licenses (including a California Contractor's License, if applicable) or other permits to perform the work or provide the goods as identified in this Bid packet. Upon request, each Bidder shall furnish the Port with evidence demonstrating possession of the required licenses or permits. Failure to submit such evidence to the Port's satisfaction may result in rejection of the Bid.
38. Public Records Act: Per the Public Records Act (Gov. Code 6250 et seq.), the Port may be obligated to make available to the public the submitted Bids and all correspondence and written questions submitted during the Bid process. Any trade secrets or proprietary financial information, which a Bidder believes should be exempted from disclosure, shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections shall not be permitted and shall be invalid. The specific information must be clearly identified as such. The Port reserves the right to independently determine whether any document is subject to disclosure and to make such information available to the extent required by applicable law, without any restriction.
39. Protest Procedures: Any Bidder that has timely submitted a responsive bid that contends or claims that the Port's proposed award of the subject contract fails to comply with the Port's rules and regulations or with law must file a protest in accordance with the provisions set forth below:
 1. Any protest must be submitted in writing to Daria Edgerly, Secretary of the Board, and received by the Port no later than 5:00 p.m. by the third (3rd) business day following the date of Bid opening.
 2. The protest must include the name, address and telephone number of the person representing the protesting party.
 3. The initial protest document must contain a complete statement of the basis for the protest, including in detail, all grounds for protest including referencing the specific portion of the solicitation document that forms the basis for the protest, and including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the protest. Any matters not set forth in the written protest shall be deemed waived. All factual contentions must be supported by competent, admissible and credible evidence.
 4. The party filing a protest must also transmit a copy of the initial protest document (and any attached documentation) concurrently to all other Bidders and any other parties that have requested such notice at the time of the filing of the protest.Any protest not conforming to the foregoing shall be rejected by the Port without recourse.
40. Conflicts of Interest: By submitting a Bid, the Bidder represents that it is familiar with Section 1090 and Section 87100 et seq. of the California Government Code and that it does not know of any facts that constitute a violation of said sections in connection with its Bid. Bidder also represents that its Bid has completely disclosed to the Port all facts bearing upon any possible interests, direct or indirect, which Bidder believes any member of the Port, or other officer, agent or employee of the Port or any department presently has, or will have, in any agreement arising from this Bid, or in the performance thereof, or in any portion of the profits there under. Willful failure to make such disclosure, if any, shall constitute ground for rejection of the Bid or termination of any agreement by the Port for cause. Bidder agrees that if it enters into a Contract (or Purchase Order) with the Port, it

will comply with all applicable conflict of interest codes adopted by the City of Oakland and Port of Oakland and their reporting requirements.

41. Bidder's Relationship: The Bidder's relationship to the Port shall be that of independent contractor and shall not be deemed to be that of an officer, agent, or employee of the Port.

End of Section

**Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)**

The undersigned having carefully examined the location of the proposed work, the local conditions of the place where the work or services is to be done, the Invitation for Bid, the Instructions to Bidders, the Standard Purchase Order Terms and Conditions, the Supplier Insurance Requirements, all Bid Documents, including the Specifications and all of the contract documents for this project, and any Attachments, Addenda, Enclosures, and the Port of Oakland's sample Contract (if applicable), proposes to perform the work or provide the goods, including all of its component parts, and to furnish any and all required labor, materials, equipment, insurance, permit, bonding, transportation and services required for this project or delivery of goods and services in strict conformity with the Plans and Specifications prepared, including any Addenda, within the time specified for the lump sum price (including all taxes) of:

Total Bid Price (Including all Taxes)

Total Bid Price of: \$ _____ (Numeric amount)

_____ (Written amount)

Written amount prevails if any discrepancy exists.

Agreement Terms

1. If awarded the Contract (or Purchase Order), the undersigned hereby agrees to sign said Contract (or Purchase Order), and furnish the necessary Performance Bond (if applicable), and Insurance within twenty (20) calendar days after the Notice of the Award of this Contract (or Purchase Order) and agrees to commence work within ten (10) calendar days after any verbal or written Notice to Proceed is issued by the Port.
2. The undersigned has checked carefully all the above figures and understands that the Port will not be responsible for any errors or omissions on the part of the undersigned in making up this Bid.
3. The Port of Oakland reserves the right to reject any or all Bids, to waive any irregularities or informalities not affected by law, to evaluate the Bids submitted and to award the Contract (or Purchase Order) according to the Bid which best serves the interests of the Port.
4. All pages of this Bid Form must be completed and signed in ink. The Bid will be awarded to the lowest responsive, responsible Bidder(s).

Bidder's Name: _____ Initials: _____

BID FORM (Page 2 of 3)

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

Bid Bond/Bid Security

If applicable (see the Instructions to Bidders), each Bid shall be accompanied by a cashier's check payable to the "Port of Oakland", or a Bidder's bond executed by an admitted surety insurer, licensed to do business in the State of California as a surety, made payable to the "City of Oakland, a Municipal Corporation Acting by and through its Board of Port Commissioners ("Port")" in an amount not less than ten percent (10%) of the maximum amount of the Total Bid Price. The check or Bid Bond shall be given as a guarantee that the Bidder to whom the Contract (or Purchase Order) is awarded shall execute the contract documents and shall provide the required Performance Bond as specified therein within twenty (20) calendar days after the Notification of the Award of the Contract (or Purchase Order).

Amount – Bidders must enclose an amount of not less than ten (10) percent of the entire Bid as either:

_____ Cashier's Check Number: _____

Issuing Bank: _____

Amount: \$ _____

_____ Bidder's Bond Surety Company: _____

Addenda Acknowledgement

The following addenda are acknowledged in this Bid: _____
(Indicate the addenda numbers that you received.)

Bidder's Name: _____ Initials: _____

BID FORM (Page 3 of 3)

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

Client References

In order for the Port to determine if your firm is a Responsible Bidder (see the Instructions to Bidders), Bidder is to provide the names, addresses, and contact information for three (3) current client references. Please make sure all contact information is current. By providing such information you authorize the Port to contact such clients.

Line	Company Name and Contact	Address	Phone and Email
1			
2			
3			

Bidder Information and Signatures

Bidder's Company Name: _____

Contact Person (print name and title): _____

Address: _____

Telephone: _____ Fax: _____

Cell: _____ Email: _____

Contractor License # (if applicable): _____ Expiration Date: _____

Signature (*): _____

(If Corporation by Chairman, President or VP. If Partnership by Partner.)

Printed Name: _____ Date: _____

Attested By (*): _____

(If Corporation, by Chairman, President, Vice President, Secretary, or Treasurer. If Partnership, by Partner.)

Printed Name: _____ Date: _____

* NOTE: If the Bidder is a corporation, set forth the legal name of the corporation together with the signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation. If the Bidder is a partnership, set forth the name of the firm together with the signature(s) of the partner or partners authorized to sign Contracts on behalf of the partnership.



PORT OF OAKLAND

STANDARD PURCHASE ORDER TERMS AND CONDITIONS

The Port of Oakland uses Purchase Orders for all purchases. Phone orders are not valid and may be subject to non-payment. In these Terms and Conditions, "the Purchase Order" refers to each Purchase Order subject to these Terms and Conditions.

A courtesy copy of these *Terms and Conditions* may be provided to Supplier at the same time as a Purchase Order, but if ever there is a conflict between the courtesy copy and the then current *Terms and Conditions* posted on the Port's website, THE WEBSITE VERSION SHALL CONTROL, however, any writing issued or signed by the Port clearly marked as "additional" or "supplemental" *Terms and Conditions* or *Insurance Requirements* shall control over any conflicting terms of the website version of those documents.

1. **THE PORT.** The Port is legally known as the City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners. The Port is an independent department of the City of Oakland and issues Purchase Orders under the name "Port of Oakland." The Port has exclusive control and management of all Port facilities and properties located in Oakland, CA (including but not limited to marine terminals, a railway intermodal terminal, and container storage areas; the Oakland International Airport; and office, retail and other developed property and undeveloped land), and no other agency or department of the City of Oakland may issue Purchase Orders with respect to these facilities and properties.

2. **SUPPLIER.** Supplier (sometimes referred to on the Port's website or in other materials related to the Purchase Order as "seller", "lessor", "vendor", "contractor", "respondent", "consultant", "service provider" or by similar terms) is an independent contractor and not an officer, employee or agent of the Port. Supplier shall provide the goods or services described on the Purchase Order (the "**Work**") using its own qualified employees or using only qualified subcontractors approved in writing by the Port. Supplier, and not the Port, shall be solely responsible for paying all compensation (including benefits), making all withholdings, paying all taxes and ensuring compliance with all laws regarding the employment of such employees or engagement of such subcontractors. Supplier may not change its subcontractors or assign, delegate or transfer, voluntarily, involuntarily or by operation of law, any of its rights or obligations under the Purchase Order (other than its interest in receivables as part of a bona fide third-party financing arrangement), without the prior written consent of the Port.

3. **PERFORMANCE AND QUALITY.** Supplier shall supply or perform the Work and represents and warrants that the Work performed or supplied is (i) as specified in the Purchase Order, (ii) in a good and workmanlike manner, (iii) in conformity to all applicable specifications, and (iv) in compliance with all Applicable Law (as defined below). Supplier further represents and warrants that all goods sold under the Purchase Order are new (unless otherwise specifically stated in the Purchase Order), merchantable and fit for the particular purpose specified by the Port, and all services provided under the Purchase Order conform to the standard of practice of persons specializing in performing services of similar nature and complexity. Nothing in the Purchase Order shall be construed to limit or

exclude any warranties implied by law. Supplier hereby assigns to the Port all of the Supplier's rights under manufacturers', subcontractors' or other warranties or indemnities with respect to the Work.

4. INVOICING AND PAYMENT. All payments require a written invoice from Supplier in a form acceptable to the Port. Supplier must issue all invoices directly to the "Bill To" address set forth in the Purchase Order. Each invoice must indicate thereon whether it constitutes a "Partial Billing" or "Final Billing". Each invoice is subject to review and verification by the Port. The time for payment of invoices (and for calculating any net discounts) shall run from the date on which proper, correct and complete invoices are received by the Port. Payment for all Work shall be made by the Port within thirty (30) days of receipt of satisfactory Work by the Port, and an itemized, proper, correct and complete invoice from Supplier. Any amounts due to the Port from Supplier may be set off against any amounts due to Supplier from the Port, whether or not under the Purchase Order.

5. DELIVERY. Supplier shall package and ship all Work consisting of goods to the Purchase Order "Ship To" address at Supplier's sole cost and expense. Packing slips must specify the quantity and description of goods shipped, the related Purchase Order number and must accompany each shipment. Supplier shall be responsible for delivery and shall prepay all related shipping costs and add them to the invoice. All goods are to be shipped F.O.B. destination: Port of Oakland, and risk of loss and title to goods shall remain with Supplier until the Port takes physical possession of the goods. The Port may change the address for shipment prior to shipment by Supplier. Goods must be suitably packed to assure against damage from weather or transportation, and in accordance with instructions of the Port.

6. REMEDIES. If Supplier breaches the Purchase Order, the Port may exercise any right or remedy available under the California Commercial Code or any other Applicable Law. Without limiting those rights and remedies, the Port may also do any of the following, in the Port's sole discretion: (i) require Supplier to repair or replace any Work, and if Supplier fails or refuses to do so, repair or replace the same at Supplier's expense; (ii) reject any delivery of non-conforming or defective Work and return the same for credit or replacement at Supplier's sole cost and risk; or (iii) cancel any outstanding deliveries and treat such breach by Supplier as Supplier's repudiation of the Purchase Order. Supplier's becoming the subject of bankruptcy or insolvency proceedings shall constitute a breach of the Purchase Order by Supplier. If the Port breaches the Purchase Order, Supplier's exclusive remedy shall be recovery of any goods shipped and the payment of the price payable for Work delivered prior to the breach. No limitation or exclusion by Supplier of any right or remedy available to the Port shall be effective unless expressly and specifically agreed to by the Port in writing. Under no circumstances shall the Port be responsible for consequential, punitive or incidental damages.

7. LAWS, REGULATIONS, PERMITS. Supplier shall comply with all applicable laws, ordinances, rules, regulations, codes, professional standards, permits, and/or land use restrictions or limitations of any governmental authority at any time applicable to Supplier, the Work or the Purchase Order ("**Applicable Law**"). Supplier shall obtain and maintain in full force and effect all professional, contracting and other permits and licenses required to undertake or supply the Work.

8. ADA. Without limiting Supplier's obligations to comply with Applicable Laws generally, Supplier hereby warrants that all Work complies with the accessibility requirements of the American with Disabilities Act of 1990, other similar state and federal

laws and their implementing regulations, as applicable. Supplier agrees to promptly respond to and resolve any complaint regarding accessibility of the Work which is brought to its attention. Supplier further agrees to indemnify, defend and hold harmless the Port and all of its officers, commissioners, agents, departments, officials, representatives and employees using the Work from any loss, liability or claim arising out of its failure to comply with these accessibility requirements.

9. NON-DISCRIMINATION. Without limiting Supplier's obligation to comply with Applicable Laws generally, Supplier shall not discriminate against any employee or applicant for employment, nor against any subcontractor or applicant for a subcontractor contract, because of race, color, religion, sex, national origin, ancestry, age (over forty (40)), physical or mental disability, cancer-related medical condition, a known genetic pre-disposition to a disease or disorder, veteran status, marital status, or sexual orientation.

10. WORK PRODUCT, ROYALTIES, PATENTS. Any interest (including copyright or other interests in intellectual property) of Supplier in studies, reports, memoranda, computational sheets, designs, drawings, specifications or any other documents (including electronic media) or work product prepared by or on behalf of Supplier in connection with the Work (collectively, the "**Work Product**"), whether or not embodied therein, constitutes a work for hire and is the property of the Port. Supplier shall pay all royalties and license fees necessary for or relating to the Work and shall defend all suits of claims for infringement of any patents or other intellectual property rights and shall indemnify the Port and hold it harmless from liability or loss on account thereof.

11. INSURANCE. Supplier shall maintain all insurance required under Applicable Law or commonly maintained by similarly situated, responsible businesses and in all events will maintain insurance of the types and in the amounts applicable to Supplier and the Work as required by the Port's *Supplier Insurance Requirements* posted from time to time on the Port's website (<http://www.portofoakland.com/>) and can be accessed by clicking on "Full Menu" (or the menu icon from your mobile device), then under the Business heading, click on "Purchasing and Accounts Payable", and scroll down to find the "Supplier Insurance Requirements (PDF)" to download the document, or alternatively type in the below link into your browser: http://www.portofoakland.com/files/PDF/supplier_insurance.pdf

A courtesy copy of the Port's *Supplier Insurance Requirements* may be delivered to Supplier at the same time as the Purchase Order. (In the event of any conflict between any courtesy copy of the *Insurance Requirements*, and the version of the *Insurance Requirements* posted to the Port's website, the website version shall control). The type, scope and amounts of the required insurance may be increased should the scope of Work, in the opinion of the Port, warrant such increase, and Supplier shall obtain such insurance when so directed by the Port. If any portion of the Work is to be performed outside the United States, Supplier must contact the Port Risk Management Department regarding appropriate insurance. At the Port's request, Supplier shall file with the Port certificates evidencing the insurance maintained by Supplier and failure to do so shall constitute a material breach of the Purchase Order.

12. TAXES. Unless otherwise provided for in the Purchase Order, Supplier shall pay all taxes levied upon the Purchase Order or the Work performed or supplied pursuant hereto without additional compensation, regardless of which party has liability for such tax under Applicable Law, and any deficiency, interest or penalty asserted with respect thereto. The Port shall pay only California sales and use tax and Alameda County uniform local sales

and use tax. Supplier must separately itemize all sales and use taxes on its invoices.

13. BOOKS AND RECORDS. Supplier shall maintain all documents and records prepared by or furnished to Supplier in connection with the Purchase Order and backup for all costs for which the Port was directly or indirectly invoiced during the course of supplying or performing the Work for at least three (3) years following delivery of final payment by the Port, provided that all records relating to environmental consulting services and hazardous materials in, on or adjacent to the Port's property shall be maintained indefinitely. Supplier agrees that its books and records and facilities, or so much thereof as may be engaged in the performance of the Purchase Order, are subject to inspection and audit at all reasonable times by any authorized representative of the Port. Supplier agrees to waive, to the greatest extent permitted by Applicable Law, the defense of laches, statute of limitations, or any other defense based upon the Port's failure to timely file an action with regard to any matter arising out of the Purchase Order.

14. WAIVER AND HOLD HARMLESS. Supplier waives any and all claims, causes of action and rights to recovery, in law or in equity, against the Port for losses, liabilities, damages or injuries of any nature or kind, including injuries to Supplier's employees or subcontractors, regardless of whether such losses, damages, liabilities or injuries are covered by insurance. This provision is intended to waive fully, for the benefit of the Port, any rights or claims that might provide a right of subrogation in favor of any insurer providing insurance with respect to the Purchase Order. To the fullest extent permitted by Applicable Law (including, without limitation, California Civil Code Section 2782), Supplier shall defend (with legal counsel chosen or approved by the Port), indemnify and hold the Port and all of its officers, Commissioners, agents, departments, officials, representatives and employees harmless from and against any and all claims, loss, or liability of every kind, nature and description that arise from or relate to, directly or indirectly, in whole or in part: (i) the Work under the Purchase Order, or any part thereof; or (ii) any act or omission of Supplier, its employees, subcontractors or representatives.

15. CHANGES. The Purchase Order may not be modified, supplemented, or terminated without the Port's prior written approval. The Port may make changes to the Purchase Order at any time, and Supplier agrees to accept such changes. If such changes result in additional costs, the Port shall make an equitable adjustment to the purchase price at Supplier's request, provided that Supplier itemizes and justifies to the Port's satisfaction in writing the adjustment requested within five (5) days of delivery of the change notification.

16. SUSPENSION OR TERMINATION. Supplier must continue to perform the Work under the Purchase Order throughout the course of any dispute, and Supplier's failure to continue Work during a dispute shall itself constitute a material breach of the Purchase Order. The Port may, with or without cause, direct Supplier to suspend, delay or interrupt the execution of any Work, in whole or in part, for such periods of time as the Port may determine in its discretion; any such directives must be in writing. The Port may, at any time, terminate the Purchase Order for its own convenience with the Port's liability limited to the services or goods received by the Port prior to delivery of the Port's termination notice. Upon any termination, Supplier shall assign to the Port in the manner, at times and to the extent directed by the Port, all right, title, and interest of Supplier under procurement orders and subcontracts relating to Work so terminated and shall transfer title and possession to the Port of Work Product, completed and uncompleted designs and specifications, Work in process, completed Work, supplies, and other material produced or fabricated as part of, or acquired in connection with performance of the Work terminated by the notice of

termination.

17. CONFIDENTIALITY AND PUBLICITY. All data, information, reports, plans, designs and other documents (collectively, the “**Confidential Information**”) received from the Port or its employees, agents or representatives or generated by Supplier in connection with the Work are privileged and confidential and shall remain the sole and exclusive property of the Port. Supplier shall not disclose the identity of the Port, nor distribute or disclose Confidential Information to any third party, without express written authorization from the Port. All Confidential Information shall be deemed confidential and Supplier shall take all reasonable precautions to prevent its disclosure to unauthorized persons. Any publicity or press releases with respect to the Work or the Purchase Order shall be under the Port’s sole discretion and control.

18. COVENANT AGAINST CONTINGENT FEES. Supplier warrants that no person or agency has been employed or retained to solicit or obtain the Contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Port, at its option, may annul the Contract or deduct from the contract price or otherwise recover from Supplier the full amount of the contingent fee. As used in this Section, "bona fide agency" means an established commercial or selling agency, maintained by Supplier for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Port contracts nor holds itself out as being able to obtain any Port contract or contracts through improper influence. As used in this Section, "bona fide employee" means a person, employed by Supplier and subject to Supplier’s supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Port contracts nor holds itself out as being able to obtain any Port contract or contracts through improper influence. As used in this Section, "contingent fee" means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Port contract. As used in this Section, "improper influence" means any influence that induces or tends to induce a Port Commissioner, employee or officer to give consideration or to act regarding a Port contract on any basis other than the merits of the matter.

19. FEDERAL AIP GRANT COMPLIANCE. By executing this Contract, Supplier agrees and certifies that Supplier will comply with the FAA Airport Improvement Program (AIP) provisions set forth below (Sections 20 through 24) and Supplier shall also include each of these provisions in all of its contracts and subcontracts related to this Contract. For purposes of Sections 19 through 24, Supplier is sometimes hereinafter referred to as “Contractor” and Port is sometimes hereinafter referred to as “Sponsor”.

20. GENERAL CIVIL RIGHTS PROVISIONS. The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision binds the Contractor and subtier contractors from the bid solicitation period through the completion of the Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

21. COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS. During the performance of this Contract, the contractor, for itself, its assignees, and successors in interest (hereinafter collectively referred to as the “Contractor”) agrees as follows:

- 21.1 COMPLIANCE WITH REGULATIONS. The Contractor (hereinafter includes any and all consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract.
- 21.2 NON-DISCRIMINATION. The Contractor, with regard to the work performed by it during the Contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
- 21.3 SOLICITATIONS FOR SUBCONTRACTS, INCLUDING PROCUREMENTS OF MATERIALS AND EQUIPMENT. In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the Contractor's obligations under this Contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
- 21.4 INFORMATION AND REPORTS. The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
- 21.5 SANCTIONS FOR NONCOMPLIANCE. In the event of a Contractor's noncompliance with the Non-discrimination provisions of this Contract, the Sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:
- a. Withholding payments to the Contractor under the Contract until the Contractor complies; and/or
 - b. Cancelling, terminating, or suspending a Contract, in whole or in part.
- 21.6 INCORPORATION OF PROVISIONS. The Contractor will include the provisions of Sections 21.1 through 21.6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Sponsor to enter into any litigation to protect the interests of the Sponsor. In addition, the Contractor

may request the United States to enter into the litigation to protect the interests of the United States.

22. TITLE VI LIST OF PERTINENT NONDISCRIMINATION ACTS AND AUTHORITIES. During the performance of this Contract, the Contractor, agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR Part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation—Effectuation of Title VI of The Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 CFR Parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance,

national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

23. FAIR LABOR STANDARDS ACT. This Contract incorporates by reference the provisions of 29 U.S.C. §201, et seq (the Federal Fair Labor Standards Act (FLSA)), and its implementing regulations, with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping and child labor standards for full and part time workers. Supplier has full responsibility to monitor compliance to the referenced statute and regulation. Supplier must address any claims or disputes that arise from this requirement directly with the US Department of Labor – Wage and Hour Division.

24. OCCUPATIONAL SAFETY AND HEALTH ACT. This Contract incorporates by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. Supplier must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. Supplier retains full responsibility to monitor its compliance and its subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 U.S.C. §651, et seq; 29 CFR Part 1910). S must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

25. GOVERNING LAW AND VENUE. The Purchase Order shall be governed by California law. Legal actions relating to the Purchase Order shall only be brought in the federal or state courts of Alameda County, California, to which jurisdiction Supplier irrevocably submits.

26. GENERAL. All correspondence and notices directed to the Port, other than invoices (which are to be delivered to the "Bill To" address set forth in the Purchase Order) must be in writing and delivered to Port of Oakland, Board of Port Commissioners, P.O. Box 2064, Oakland, CA 94604. The Purchase Order is for the sole benefit of the Port and Supplier, and their respective permitted successors and assigns, and nothing in the Purchase Order, express or implied, is intended to confer upon any other person any right, benefit or remedy of any nature whatsoever under or by reason of the Purchase Order. Time is of the essence in Supplier's performance of Supplier's obligations under the Purchase Order. The making or approval of any payment and any inspections, reviews, approvals or oral statements by or on behalf of the Port, or of certification by any governmental entity, in no way limits Supplier's obligations under the Purchase Order.



PORT OF OAKLAND

Supplier Insurance Requirements

During any period Supplier performs the Work, and for such additional time as described below, Supplier shall maintain the following insurance with the following provisions:

1. Commercial General Liability Insurance

- **When Required:** All Suppliers performing Work.
- **Coverage:** Standard ISO Commercial General Liability form.
- **Limits:** \$5,000,000 per occurrence; \$5,000,000 annual general aggregate; \$5,000,000 products and completed operations aggregate; \$5,000,000 each offense for personal and advertising injury.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per occurrence unless otherwise approved by Port Risk Management.
- **Additional Insured:** The City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.
- Cross liability/separation of insureds.
- Waiver of subrogation in favor of additional insured.
- If the Work involves construction activities, completed operations coverage must remain in force until at least 5 years after completion and acceptance of the Work.
- If the Work involves the sale of liquor, liquor legal liability insurance.
- If the Work involves construction or demolition work within 50 feet of railroad property, Railroad Protective Liability insurance in the name of the applicable railroad company with limits of at least \$2,000,000 per occurrence or as required by the applicable railroad company.

2. Business Automobile Liability Insurance

- **When Required:** All Suppliers performing Work.
- **Coverage:** Standard ISO Business Automobile Liability form for all owned (if any), non-owned and hired automobiles.
- **Limits:** \$1,000,000 each accident, except \$5,000,000 for vehicles operating in the South Field, the Aviation Operating Area ("AOA"), or any active airfields of the Oakland International Airport.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per accident unless otherwise approved by Port Risk Management.
- **Additional Insured:** The City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.
- Waiver of subrogation in favor of additional insured.
- If the Work involves the parking or storage of vehicles, Garagekeeper's Liability insurance.
- If the Work involves valet parking, Valet Liability insurance.

3. Workers' Compensation and Employer's Liability Insurance

- **When Required:** All Suppliers performing Work.
- **Coverage:** Statutory Workers' Compensation and Side B Employer's Liability form.
- **Limits:** Statutory for workers' compensation and \$1,000,000 per accident, \$1,000,000 bodily injury each employee, and \$1,000,000 policy limit for bodily injury by disease, for Employer's Liability.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per occurrence for Employer's Liability unless otherwise approved by Port Risk Management.

- If Work is performed in or around water (whether in the Port maritime area or elsewhere), U.S. Longshoremen and Harbor Workers Act coverage and, if applicable, Jones Act and Marine Employer's Liability coverage.
- Waiver of subrogation in favor of the City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.

4. Professional "Errors and Omissions" Liability Insurance

- **When Required:** If the Work involves consulting, temporary staffing, testing, design or technology services.
- **Coverage:** For errors and omissions arising out of the Work.
- **Limits:** \$1,000,000 per claim and annual aggregate.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per claim unless otherwise approved by Port Risk Management.
- **Additional Term:** 2 years after completion and acceptance of the Work.
- If Work involves software or technology services, Technology Liability coverage, including coverage for privacy liability.
- If the Work involves outsourced internet services, Network and Media Liability coverage.

5. Contractor's Pollution Legal Liability Insurance

- **When Required:** If the Work involves any construction activities, or any grading, excavating, underground utilities, piping, trenching, or any Work below the surface of the ground, or involves the hauling or disposal of hazardous or regulated materials.
- **Coverage:** Contractor's Pollution Legal Liability occurrence or claims made form.
- **Limits:** \$1,000,000 per occurrence and \$2,000,000 annual aggregate.
- **Deductible/Self-Insured Retention:** Not more than \$100,000 per occurrence unless otherwise approved by Port Risk Management.
- **Additional Insured:** The City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.
- Waiver of subrogation in favor of additional insured.
- **Additional Term if Claims Made Form:** 2 years following completion and acceptance of the Work.
- **Definition of "Covered Operations":** All Work performed by Supplier or its contractors or subcontractors.

6. Aviation Insurance

- **When Required:** If Supplier or its subcontractors utilize aircraft in the Work.
- **Coverage:** Aviation Public Liability and Passenger Liability forms.
- **Limits:** \$1,000,000 combined single limit per accident for use of aircraft with up to 4 seats; such limit shall be \$5,000,000 for use of aircraft with 5 or more seats. However, use of jet aircraft of any size will need to be referred to Risk Management to determine amount of insurance required.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per accident unless otherwise approved by Port Risk Management.
- **Additional Insured:** The City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.

7. Protection and Indemnity Insurance

- **When Required:** If Supplier or its subcontractors utilize watercraft/vessels in the Work.
- **Coverage:** Liability for bodily injury and property damage including wreck removal and liability to crew, and SP-23 clause or equivalent, including collision liability.
- **Limits:** \$1,000,000 per person on board the watercraft for bodily injury and property damage, but no less than \$5,000,000 for watercraft of a length of 30 feet to 39 feet and no

less than \$10,000,000 for watercraft 40 feet and over; any passenger services watercraft will need to be referred to Risk Management to determine amount of insurance required.

- **Deductible/Self-Insured Retention:** Not more than \$25,000 per occurrence unless otherwise approved by Port Risk Management.
- **Additional Insured:** The City of Oakland, a Municipal Corporation, Acting by and through its Board of Port Commissioners, Port of Oakland, its commissioners, officers, agents and employees.
- Waiver of subrogation in favor of additional insured.
- Deletion of any language that limits coverage to additional insured in the event the Limitation of Liability Statute applies.

8. Builder's Risk/Equipment Installation Insurance.

- **When Required:** If Work involves new construction of buildings or facilities, or the renovation of existing buildings or facilities..
- **Coverage:** "All risk" or "special form" perils, earthquake and terrorism, including risks from testing of equipment, and delayed completion coverage for soft costs.
- **Limits:** Full replacement cost value of the construction, covering the entire Work, including all materials and equipment that are or will be incorporated into the construction, or stored at the construction site or offsite, and including materials or equipment in the course of transportation.
- **Deductible/Self-Insured Retention:** Not more than \$25,000 per occurrence unless otherwise approved by Port Risk Management.
- **Term:** Until final completion and acceptance of the Work and for 2 years for delayed completion coverage.
- **Additional Insured and Loss Payee:** The City of Oakland, a Municipal Corporation, Acting by the through its Board of Port Commissioners.
- Waiver of subrogation in favor of additional insured and its commissioners, officers, agents and employees.
- Primary and non-contributory with any insurance, retention or self-insurance of the Port.

Other Insurance Requirements:

- **Notice of Cancellation.** Supplier or Supplier's agent must provide 30-days prior written notice to the Port Risk Management Department of any insurance policy cancellation, except 10-days prior written notice for non-payment of premium.
- **Proof of Insurance/Insurer Rating.** Supplier must deliver to the Port Risk Management Department, prior to the commencement of the Work, certificates of insurance evidencing all required insurance and additional insured status for the Port. All required insurance shall be provided by insurance companies with current A.M. Best ratings of A- VII or better. Please send certificates and other required information to:

Port of Oakland
Attn: Risk Management Dept.
530 Water Street
Oakland, Ca 94607
Fax: (510) 627-1626
Email: risktransfer@portoakland.com

Conversion to OCIP. The Port reserves the right to include the Purchase Order in an Owner Controlled Insurance Program ("OCIP"), upon written notice to Supplier. In that event, Supplier agrees to comply with all requirements of the OCIP.



Non Collusion Declaration

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

(To Be Executed by Bidder and Submitted with the Bid)

I, _____, declare as follows:

That I am the _____ of _____, the party making the attached Bid; that the attached Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham Bid, or that anyone shall refrain from Bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or to fix any overhead, profit, or cost element of the Bid price, or that of any other Bidder, or to secure any advantage against the public body awarding the Contract (or Purchase Order) of anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that the Bidder has not, directly or indirectly, submitted his or her Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, Bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed this _____ day of _____, 201__, at
_____, California

Signature



PORT OF OAKLAND

City of Oakland City Charter § 728 Living Wage Information

EMPLOYERS SUBJECT TO §728 OF THE CITY CHARTER MUST COMPLY WITH THE FOLLOWING REQUIREMENTS:

- 1) Pay all non-exempt employees the living wage rates (As of July 1, 2017, \$15.31 without health benefits or \$13.32 with health benefits). Port Ordinance No. 3666, as amended also requires that covered businesses provide employees at least twelve compensated days off per year, including holidays.
- 2) Pay at least \$1.99 per hour worked toward the provision of health care benefits for employees and/or their dependents, if the employer claims credit for health benefits.
- 3) **Provide written notification to each current and new employee, at time of hire, of his or her rights to receive the benefits under the provisions of these regulations.** The notification shall be provided in English, Spanish and other languages spoken by a significant number of the employees, and shall be posted prominently in communal areas at the work site. A copy of said notification is available from the Port Division of Social Responsibility.
- 4) Provide all employees earning less than \$12/hour notification in English, Spanish, and any other language spoken by a significant number of employees of their right to advance Earned Income Credit payments.
- 5) **Maintain a list of the name, address, date of hire, occupation classification, rate of pay, benefits paid for each of its employees, and compensated time off - and submit this list to the Port's Social Responsibility Division, Attention: Connie Ng-Wong, Living Wage Compliance Officer, by March 31st, June 30th, September 30th, and December 31st of each year.** If a covered employer has obtained a waiver from the Port Board of Directors, then the employer must still submit an annual payroll report covering each of its employees by December 31st of each year. Failure to provide the list within five days of the due date will result in a penalty of \$500 per day. Covered employers shall maintain payrolls and basic records for all employees and shall preserve them for a period of at least three years after the close of the compliance period.
- 6) Require subcontractors, tenants and subtenants, or licensees who are covered by these requirements to comply with the provisions of these regulations. **Covered employers shall be responsible for including language committing the subcontractor's, tenant's or licensee's agreement to comply, in the contract with the subcontractor.** Covered employers shall submit a copy of such subcontracts or other such agreements to the Port Division of Social Responsibility.
- 7) Permit authorized Port representatives access to work sites and, with employee consent, relevant payroll records for the purpose of monitoring compliance with these regulations, investigating employee complaints of non-compliance and evaluating the operation and effects of these regulations, including the production for inspection and copying of its payroll records for any or all of its employees for the applicable compliance period. Permit a representative of the labor organizations in its industry to have access to its workforce at the Port during non-working time and in non-work areas to ensure compliance.

Employers who fail to submit documents, declarations or information required to demonstrate compliance with these regulations shall be deemed noncompliant or non-responsive and subject to the remedies as set forth in §728.



PORT OF OAKLAND

**Employer Self-Evaluation for
Port of Oakland Living Wage**

COVERED BUSINESS CHECKLIST WRITE YES/NO ANSWER IN APPROPRIATE BOX:

1. ☐ Is the Business entering into a contract, tenancy agreement or subordinate agreement (such as, subcontract, subtenancy, or sublicense) with the Port? *If no, go on to question 2. If yes, go to question 3.*
2. ☐ Has the Business amended an existing contract, tenancy agreement or subordinate agreement at any time since April 2002? *If no to 1 and 2, stop here: the business is not covered. If yes, go to question 3.*
3. ☐ Is the contract with Aviation or Maritime divisions for a value of greater than \$50,000 over the life of the contract (over the next five years if contract is for less than a year and expected to be renewed or extended)? *If no, stop here; the contract is not covered. If yes, go to question 4.*
4. ☐ Is the contract for service other than the delivery of products, equipment or commodities? *If no, stop here: the business is not covered. If yes, go to question 5.*
5. ☐ Does the Business employ more than 20 employees who spend at least 10 hours per week (4 hours per week if part time employees) working under the contract with the Port or on Port property? Indicate the number of employees that are employed by the Contractor _____. *If no, stop here the business is not covered. If yes, go to question 6, exemptions for specified employees of a covered employer.*

All employees of a covered employer are required to be provided compensation and other benefits as provided under §728 of the Charter, except for specified employees exempt under the following exemptions. The following questions should be answered for each employee.

6. ☐ *Does the employee work less than 25% of his/her time (10 hours per week for full time employee) under the contract with the Port? If yes, stop here; the specified employee is exempt. If no, go to question 7.*
7. ☐ *Is the employee under 21 years of age, employed by a government agency or nonprofit for after school or summer employment, or as a trainee for 90 days or less? If yes, stop here; the specified employee is exempt. If no, go to question 8.*
8. ☐ *Has the Business obtained a waiver that covers the employee? If yes, stop here; the specified employee is exempt. If no, go to question 9.*
9. ☐ *Is the employee participating in a bona-fide temporary job-training program in which a significant part of the compensation consists of acquiring specialized knowledge, abilities or skills in a recognized trade? If yes, stop here; the specified employee is exempt. If no, go to question 10.*

10. ☐ *Is the employee a volunteer who is not compensated other than for incidental expenses or stipends? If yes, stop here; the specified employee is exempt. If no, go to question 11.*
11. ☐ *Is the employee working for the Business less than 20 hours per week for a period of 6 months or less? If yes, stop here the specified employee is exempt. If no, go to question 12.*
12. ☐ *Of the remaining employees (employees for which no exemption applies as indicated by your answers to questions 6 through 11), are there 20 or fewer non-exempt employees working for the employer under the Port Contract? If yes, stop here; each of the remaining specified employee(s) is/are exempt. If no, each of the remaining specified employee(s) is covered by §728.*

The undersigned authorized representative of Contractor hereby certifies under penalty of perjury that all of the information on this form is true and accurate.

_____ Company Name	_____ Signature of Authorized Representative
_____ Address	_____ Type or Print Name & Title
_____ Area Code and Phone	_____ Email Address
_____ Name of Primary Contact	_____ Date
_____ Project Name (Be Specific)	

Submit Completed Checklist To:

Connie Ng-Wong

Port of Oakland

Social Responsibility Division

530 Water Street

Oakland, CA 94607

Phone: (510) 627-1390 Fax: (510) 451-1656

Email: cng-wong@portoakland.com



PORT OF OAKLAND

Certificate of Compliance – Living Wage

The City of Oakland Living Wage Charter §728 ("§728") and Port Ordinance No. 3666 ("Ordinance 3666") as amended, provide that certain employers that enter into a contract, lease, license (or a subcontract, sublease, sublicense, or other agreement) with the Port for \$50,000 or more over the term of the contract and certain recipients of Port financial assistance for \$50,000 or more shall pay a prescribed minimum level of compensation to their covered employees ("Employees").

The undersigned ("Contractor") submits this certificate under penalty of perjury and as a condition of payment of its invoice(s) for service provided under the _____ agreement between the Port and Contractor.

- 1) Contractor hereby certifies that it is in compliance with §728 and Ordinance 3666 with respect to all non-exempt Employees of Contractor engaged in Port-related employment or work on Port property.
- 2) Contractor hereby acknowledges that the Port is relying on Contractor's certification of compliance with §728 and Ordinance 3666 as a condition of payment of Contractor's invoice(s).
- 3) Contractor understands that it may be subject to fines or penalties for noncompliance with §728 and Ordinance 3666 up to and including potential fines of \$500 per day until Contractor complies.
- 4) Contractor hereby certifies that claims, records and statements relating to Contractor's compliance with §728 and Ordinance 3666 are true and accurate, that such claims, records and statements are made with the knowledge that the Port will rely on such claims, records and statements, and that such claims, records and statements are submitted to the Port for the express benefit of Contractor's employees engaged in Port-related employment or work on Port property.

Please check the appropriate box and sign below

- ☐ Contractor hereby certifies its compliance with all of its obligations under §728 and Ordinance 3666;
- ☐ Contractor hereby certifies that all Employees of Contractor working under Contractor's contract with the Port are compensated at wage rate(s) greater than \$12.00 per hour;
- ☐ Contractor hereby certifies that it is not currently covered by §728 or Ordinance 3666. Contractor further certifies that should §728 or Ordinance 3666 become applicable, Contractor will comply with all of its Living Wage obligations.

All terms used herein and not defined shall have the meaning ascribed to such terms in §728 and Ordinance 3666.

The undersigned authorized representative of Contractor hereby certifies under penalty of perjury that all of the information on this form is true and accurate.

_____ Company Name	_____ Signature of Authorized Representative
_____ Address	_____ Type or Print Name & Title
_____ Phone and Email	_____ Date
_____ Project Name (Be Specific)	

Submit to: Connie Ng-Wong, Port of Oakland, Social Responsibility Division, 530 Water Street, Oakland, CA 94607. Email: cng-wong@portoakland.com



PORT OF OAKLAND

Statement of Living Wage Requirements

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

I hereby certify that _____ (Legal Name of Bidder/Respondent/Supplier/Consultant/Contractor), has reviewed the Living Wage Requirements, included in this Bid packet and will comply with said Requirement. Upon execution of an Agreement, the selected Bidder will be required to complete the Employer Self-Evaluation for Port of Oakland Form and Certificate of Compliance – Living Wage Form included in this Bid packet, and submit them to the Social Responsibility Division.

I declare under penalty of perjury under the laws of the State of California that the information I have provided herein is true and correct.

Signature

Print Name

Title

Date



PORT OF OAKLAND

Statement of Equal Employment Opportunity

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

I hereby certify that _____(Legal Name of Bidder/Supplier/Consultant/Contractor), will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, ancestry, age (over 40), physical or mental disability, cancer-related medical condition, a known genetic pre-disposition to a disease or disorder, veteran status, marital status, or sexual orientation.

I declare under penalty of perjury under the laws of the State of California that the information I have provided herein is true and correct and is of my own personal knowledge.

Signature

Print Name

Title

Date



PORT OF OAKLAND

Bid Bond

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

KNOW ALL BY THESE PRESENTS:

That the undersigned _____ as Principal ("Principal") and the undersigned as Surety ("Surety") are held and firmly bound unto the City of Oakland, a Municipal Corporation Acting by and through its Board of Port Commissioners ("Port"), as obligee, in the penal sum of _____ Dollars (\$_____) lawful money of the United States of America, being at least ten (10)% of the aggregate amount of said Principal's total bid, for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a bid for the Port of Oakland's Project:

THE CONDITION OF THIS OBLIGATION IS SUCH that if the bid submitted by the said Principal be accepted and the Contract (or Purchase Order) be awarded to said Principal and said Principal shall within a period of twenty (20) days after such award enter into the Contract so awarded and provide the required Performance Bond, insurance certificates and all other endorsements, forms and documents required under this Bid, Instructions to Bidders, then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument this

_____ day of , 20__.

(Corporate Seal)

Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____

Title _____

(To be signed by Principal and Surety and Acknowledgment and Notary Seal to be attached.)



PORT OF OAKLAND

Performance Bond

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

PROCUREMENT PERFORMANCE BOND

THIS PERFORMANCE BOND ("Bond") is dated _____ is in the penal sum of one hundred percent (100%) of the Contract Sum, which is _____ Dollars (\$_____.00), and is entered into by and between the parties listed below to ensure the faithful performance of the procurement of _____. This Bond consists of this page and the Bond Terms and Conditions, Sections 1 through 12, attached to this page. Any singular reference to _____ (the "Contractor" hereunder also referred to as "Vendor" under the terms of the Procurement Contract identified below), _____ (the "Surety"), City of Oakland, a municipal corporation, acting by and through its Board of Port Commissioners (the "Port") or other party shall be considered plural where applicable.

CONTRACTOR/VENDOR:

Name

Address

OWNER:

CITY OF OAKLAND,
A Municipal Corporation, By and
Through Its Board of Port Commissioners

Address: 530 Water Street
Oakland, CA 94607
Attention: Port Attorney

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____

Name and Title: _____

Approved as to Form and Legality this ____ day of
_____, 201__

DANNY WAN, Port Attorney

SURETY:

Name

Principal Place of Business

PROCUREMENT CONTRACT:

Oakland, California (SBE)

DATED _____, 201__
Contract No. _____

SURETY
Company:

Signature: _____

Name and Title: _____

Address

Contact Person

Telephone Number

BOND TERMS AND CONDITIONS

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Port for the complete and proper performance of the Procurement Contract, which is incorporated herein by reference.
2. If the Contractor completely and properly performs all of its obligations under the Procurement Contract, the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Port Default, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Port has declared a Contractor Default under the Procurement Contract pursuant to the terms of the Procurement Contract; and
 - 3.2 The Port has agreed to pay the Balance of the Contract Sum to:
 - 3.2.1 The Surety in accordance with the terms of this Bond and the Procurement Contract; or
 - 3.2.2 To a contractor selected to perform the Procurement Contract in accordance with the terms of this Bond and the Procurement Contract.
4. When the Port has satisfied the conditions of Section 3, the Surety shall promptly (within thirty (30) days) and at the Surety's expense elect to take one of the following actions:
 - 4.1 Arrange for the Contractor, with consent of the Port, to perform and complete the Procurement Contract (but Port may withhold consent, in which case the Surety must elect an option described in Sections 4.2, 4.3 or 4.4, below); or
 - 4.2 Undertake to perform and complete the Procurement Contract itself, through its agents or through independent contractors; or
 - 4.3 Obtain bids from qualified contractors acceptable to the Port for a contract for performance and completion of the Procurement Contract, and, upon determination by the Port of the lowest responsible bidder, arrange for a contract to be prepared for execution by the Port and the contractor selected with the Port's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Procurement Contract; and, if the Surety's obligations defined in Section 6, below, exceed the Balance of the Contract Sum, then the Surety shall pay to the Port the amount of such excess; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor acceptable to the Port and with reasonable promptness under the circumstances, and, after investigation and consultation with the Port, determine in good faith the amount for which it may then be liable to the Port under Section 6, below, for the performance and completion of the Procurement Contract and, as soon as practicable after the amount is determined, tender payment therefor to the Port with full explanation of the payment's calculation. If the Port accepts the Surety's tender under this Section 4.4, the Port may still hold Surety liable for future damages then unknown or unliquidated resulting from the Contractor Default. If the Port disputes the amount of Surety's tender under this Section 4.4, the Port may exercise

all remedies available to it at law to enforce the Surety's liability under Section 6, below.

5. If the Surety does not proceed as provided in Section 4, above, then the Surety shall be deemed to be in default on this Bond ten (10) days after receipt of an additional written notice from the Port to the Surety demanding that the Surety perform its obligations under this Bond. At all times the Port shall be entitled to enforce any remedy available to the Port at law or under the Procurement Contract including, without limitation, and by way of example only, rights to perform work, protect work, mitigate damages, or coordinate work with other consultants or contractors.
6. The Surety's monetary obligation under this Bond is limited by the penal sum of this Bond. Subject to these limits, the Surety's obligations under this Bond are commensurate with the obligations of the Contractor under the Procurement Contract. The Surety's obligations shall include, but are not limited to:
 - 6.1 The responsibilities of the Contractor under the Procurement Contract for completion of the Procurement Contract and correction of defective work;
 - 6.2 The responsibilities of the Contractor under the Procurement Contract to pay liquidated damages, and for damages for which no liquidated damages are specified in the Procurement Contract, actual damages caused by non-performance of the Procurement Contract, including but not limited to, all valid and proper backcharges, offsets, payments, indemnities, or other damages;
 - 6.3 Additional legal, design professional and delay costs resulting from the Contractor Default or resulting from the actions or failure to act of the Surety under Section 4, above.
7. No right of action shall accrue on this Bond to any person or entity other than the Port or its successors or assigns.
8. The Surety hereby waives notice of any change, alteration or addition to the Procurement Contract or to related subcontracts, purchase orders and other obligations, including changes of time. The Surety consents to all terms of the Procurement Contract, including provisions on changes to the Contract. No extension of time, change, alteration, modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond.
9. Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction where a proceeding is pending between the Port and the Contractor regarding the Procurement Contract, or in the courts of the County of Alameda, or in a court of competent jurisdiction in the location in which the work is located.
10. Notice to the Surety, the Port or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by the Surety, the Port or the Contractor at the address shown on the signature page, however accomplished, shall be sufficient compliance as of the date received.

11. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein.
12. Definitions.
 - 12.1 Balance of the Contract Sum: The total amount payable by the Port to the Contractor pursuant to the terms of the Procurement Contract after all proper adjustments have been made under the Procurement Contract, for example, deductions for progress payments made, and increases/decreases for approved modifications to the Procurement Contract.
 - 12.2 Procurement Contract: The agreement between the Port and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 12.3 Contractor Default: Material failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Procurement Contract, including but not limited to, "default," as provided in Document 00700 General Conditions.
 - 12.4 Port Default: Material failure of the Port, which has neither been remedied nor waived, to pay the Contractor progress payments due under the Procurement Contract or to perform other material terms of the Procurement Contract, if such failure is the cause of the asserted Contractor Default and is sufficient to justify the Contractor's termination of the Procurement Contract.

END OF DOCUMENT

**Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)**

Item	Description	Taxable	QTY	Total Price
1	Berth 24 (Substation SS-C-48) Switchgear, NEMA 3R outdoor, 15kV metal-clad switchgear assembly, complete with draw-out circuit breakers, load interrupter switches, and additional components and functions. Note: Refer to Plans and Specifications for requirements.	Yes	1	\$
2	Additional Materials – Refer to Section 16342 (Enclosure D), 1.06 Additional Materials Note: Use a separate sheet to list all additional materials and cost breakdown	Yes		\$
3	Extra Materials – Refer to Section 16343 (Enclosure E), 1.06 Additional Materials Note: Use a separate sheet to list all additional materials and cost breakdown	Yes		\$
4	Other Charges: Please Specify: _____	<input type="checkbox"/> YES <input type="checkbox"/> NO		\$
Subtotal				\$
Delivery and Shipping Charges (Taxable <input type="checkbox"/> YES <input type="checkbox"/> NO)				\$
Other Charges or Fees: Please Specify: _____ (Taxable <input type="checkbox"/> YES <input type="checkbox"/> NO)				\$
Sales Tax for Taxable items only (Alameda County at 9.25%)				\$
(Write this figure in the Total Bid Price on the Bid Form, Attachment 2) Total Bid Price				\$

DELIVERY SCHEDULE: _____ Delivery on schedule is required no later than 126 calendar days after the Contract is fully executed. All shipments shall be made FOB Destination Time is of the essence in delivery of the new Medium Voltage Switchgear of 126 calendar days. If you are able to meet the equipment delivery date, then write in "126 calendar days" in the space provided; otherwise, indicate the delivery duration in calendar days.

Bidder's Name: _____ **Date:** _____

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

By submitting a bid, Bidder hereby certifies the following information (by checking the box below):

- ☐ YES ☐ NO Bidder is an authorized reseller/dealer/manufacture/assemble.
- ☐ YES ☐ NO Bidder has read and reviewed all enclosures and its requirements prior to submitting a bid.
- ☐ YES ☐ NO Bidder has included the required Bid Bond and agrees to provide a Procurement Performance Bond after contract award.
- ☐ YES ☐ NO Bidder agrees on liquidated damages for delay of Two Thousand Dollars (\$2,000) for each calendar day or fraction thereof that expires after the required delivery date of 126 calendar days.
- ☐ YES ☐ NO Bidder has included required information listed on Section 16342 and Section 16343, 1.05 Submittals, item A "Submit with Bid".
- ☐ YES ☐ NO Bidder agrees to provide all additional required information listed on Section 16342 and Section 16343, 1.05 Submittals, item B "Submit After with Bid" and Section 16195, 1.02 Submittals, after contract award.
- ☐ YES ☐ NO Bidder will provide a qualified technician for equipment start-up services under the direction of the Port after equipment is installed.
- ☐ YES ☐ NO Bidder will provide up to 5 consecutive days for Port staff to be on-site at the factory during Acceptance and Testing.

Bidder's Name:

Title:

Company:

Date:

**Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)**

The Port of Oakland (sometimes referred to herein as "Buyer") is soliciting competitive bids to supply Switchgear assembly for Berth 24 (Substation SS-C-48) Switchgear. The Port has standardized on specific Switchgear components as defined in the Plans and Specifications to match existing equipment and will not accept alternative or comparable brand product. Please quote all products without making any substitutions to the product brand and model number unless otherwise noted. Refer to the following attachments for equipment details and requirements:

- A. AA-4221 Plans
- B. Section 16342 Medium Voltage Metal-Clad Switchgear
- C. Section 16343 Medium Voltage Load Interrupter Switchgear
- D. Section 16195 Electrical Identification

The Port intends to lock in pricing through this invitation for bid process and (if awarded) will issue a Procurement Contract to purchase all equipment, from one supplier. Time is of the essence in delivery of the new Medium Voltage Switchgear of 126 calendar days from the date the Procurement Contract is fully executed. The Port will suffer financial loss if the delivery of new switchgear is not completed within the specific period.

A. Product Specification

Berth 24 (Substation SS-C-48) Switchgear, NEMA 3R outdoor, 15kV metal-clad switchgear assembly, complete with draw-out circuit breakers, load interrupter switches, and additional components and functions. Refer to Plans and Specifications for additional requirements.

B. Submittal Requirements

1. This Bid calls for specific submittal requirements listed on Section 16342 (Enclosure D), section 16343 (Enclosure E), and 16195 (Enclosure F) of the equipment details and requirements. Bidders are required to submit the following requested information with their bid:

- A. Section 16342 (Enclosure D), 1.05 Submittals, item A "Submit with Bid"
- B. Section 16343 (Enclosure E), 1.05 Submittals, item A "Submit with Bid"

Failure to provide required documentation may result in bid being deemed non-responsive. All other documents will be required after contract award as stated on the submittal requirements.

2. Port Expedited Submittal Review Process
 - A. After the Port's review of Submittals, revise and resubmit as required. Identify changes made since previous submittal.
 - I. Fabrication shall not begin until submittals has been marked "No Corrections Noted".
 - II. The Port shall have a maximum of two (2) business days to process and return each submittal. Submittals submitted after 10:00a.m. will be considered received at the beginning of the next business day.

C. Additional Materials

This Bid requires bidder to furnish extra materials listed in the following sections:

- A. Section 16342 (Enclosure D), 1.06 Additional Materials
- B. Section 16343 (Enclosure E), 1.06 Extra Materials

Bidder must write in the total cost of all additional materials (see detail bid form, item 3) and provide complete list of materials and cost breakdown on a separate sheet for reference.

D. Customer Equipment Factory Acceptance Testing

Switchgear manufacturer shall provide up to 5 consecutive days for Port staff to be on-site at switchgear factory once switchgear assembly, wiring, and functional testing have been completed. Port travel costs shall not be included in bid price. The Port will be responsible for any travel cost during the 5 days period for Port staff (only).

E. Installation

This Bid does not include installation of equipment, but please review the start-up services section.

F. Start-Up Services

Provide a qualified technician for on-site equipment start-up services. The technician must certify that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations. The cost of this technician must be included in your bid price for the switchgear or in the other charges section.

G. Warranty Information

This Switchgear Manufacturer must provide warranties against defects in material, workmanship, and operation. Please refer to Section 16342 (Enclosure D), 1.09 Warranty and Section 16343 (Enclosure E), 1.09 Warranty, for required warranties.

H. Delivery

Delivery on schedule is required no later than 126 calendar days after the contract is fully executed. All shipments shall be made FOB Destination. If you are able to meet the equipment delivery date, then write in "18 weeks" in the space provided on the detail bid form; otherwise, indicate the delivery duration. The applicable delivery schedule information will be considered in the evaluation of the lowest responsible, responsive bidder.

Point of Contact:	Wayne Yeoman (Port Associate Engineer)
Ship to address:	Port of Oakland – Harbor Facilities 651 Maritime St, Oakland CA 94607

I. Bid Bond and Procurement Performance Bond

A Bid Security (or Bid Bond) and Procurement Performance Bond will be required with your Bid. Please see **Instruction to Bidders**, item 10 (Bid Bond/Bid Security) and item 17 (Performance Bond) and the accompanying Bond forms for complete details.

J. Contract Time

The Work (including acceptance following inspection) shall be completed within one hundred twenty-six (126) calendar days from the date the Procurement Contract is fully executed.

K. Liquidated Damages

The Port and the Contractor recognize that time is of the essence of this Procurement Contract and that the Port will suffer financial loss in the form of contract administration expenses (including project management and consultant's expenses) if Work is not completed within the Contract Time specified above, plus any extensions thereof allowed in accordance with the Procurement Contract. The Contractor and the Port agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of actual damages incurred by the Port because of a delay in completion of the Work (including a delay in the achievement of an event in the Milestone Schedule specified herein). Accordingly, the Port and Contractor agree that as liquidated damages for delay the Contractor shall pay the Port:

Two Thousand Dollars (\$2,000.00) for each calendar day or fraction thereof that expires after the time specified herein for the Contractor to achieve completion of the Work.

L. Milestone Payments Schedule

Milestone payment shall be made to the successful bidder in the amounts stated below. If the supplier fails to submit the required deliverables, the Port shall have the right to delay payment.

- 20% - Final Approval Drawings approved by Port Engineer
- 30% - Equipment delivered to site
- 20% - Equipment Manufacturer's start-up technician has certified equipment installation
- 20% - Final acceptance testing has been completed
- 10% - Punch list items have been completed

**Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)****1. Goods and Special Services to be Provided**

- 1.1 The Invitation for Bid describes the Goods and Special Services and other services to be provided in connection therewith by the Seller. Seller's obligation to provide the Goods and to perform the Special Services and other services in connection therewith includes but is not limited to, the provision of all labor, equipment, materials, engineering, bonding, design, testing, taxes and any other work or services or costs of any type necessary to accomplish the following:
- Manufacture and deliver to Port all Goods and accessories in conformance with the Project Specifications Plans.
 - Perform all testing and quality control to demonstrate compliance with specified quality requirements prior to delivery of any of the Goods to the point of delivery.
 - Provide all Shop Drawings and submittals in conformance with the Project Specifications Plans.
 - Design, manufacture, test and deliver (including off-loading to the site of storage at the point of delivery at the Port) the Goods and accessories in conformance with the Project Specifications Plans.
 - Provide an Operation Maintenance Manual for the Goods in conformance with the Project Specifications Plans and assist the Owner and the Installer in the interpretation of such manual as is reasonably necessary for the operation and maintenance of the Goods.
 - Provide a Bid bond and Performance bond.
- 1.2 Seller shall provide the Goods and perform the Special Services in full compliance with all applicable laws, codes and standards (both public and private), including but not limited to, the standards included and warranties and manufacturer's recommendations pertaining to individual items of equipment or systems.

2. Contract Price and Payment

- 2.1 The Contract Price is all inclusive and includes all costs for the design, manufacture, testing, bonding, taxes, and delivery of the Goods and performance of the Special Services; all costs, including but not limited to, federal, state, and local taxes for materials and equipment, and labor furnished by Seller, its subcontractors, subconsultants, engineers, testing agents, and sellers or otherwise arising out of Seller's provision of the Goods or performance of the Special Services, including any increases in any such taxes during the term of this Agreement; and any duties, fees, and royalties imposed with respect to any materials and equipment, labor or services. The taxes covered hereby include (but are not limited to) occupational, sales, use, excise, unemployment, FICA, and income taxes, customs, duties, and any and all other taxes on any item or service that is part of the Goods or the Special Services, whether such taxes are normally included in the price of such item or service or are normally stated separately. Notwithstanding the foregoing, each party shall bear such state or local inventory, real property, personal property or fixtures taxes as may be properly assessed against it by applicable taxing authorities.

3. Seller's Representations and Warranties

In order to induce the Port to enter into this Agreement, Seller makes the following representations and warranties:

- 3.1 Seller is familiar with all federal, state and local laws and regulations (including, without limitation, all applicable standards described in the Specifications) that in any manner may affect

the cost, progress or performance of furnishing the Goods and Special Services, or which relate to any aspect of the means, methods, techniques, sequences or procedures of manufacturing and testing to be employed by Seller and safety precautions and programs incident thereto.

- 3.2 Seller has the expertise, design, manufacturing and testing capabilities, and financial capabilities to perform and complete all obligations.
- 3.3 Seller is and will be at all times be fully qualified and capable of providing the Goods and performing the Special Services in conformity with the requirements of the Procurement Documents, and possesses or will timely obtain all necessary licenses and/or permits required to provide the Goods and perform the Special Services.
- 3.4 The Goods required to be provided by Seller shall be delivered free and clear of all liens, rights of conditional sellers, encumbrances, and claims of laborers or materialman, and in conformance with the requirements in the Purchase Agreement. Title will pass upon delivery and not shipment.

4. Miscellaneous

- 4.1 In entering into a public contract or a subcontract to supply goods, services or materials pursuant to a public contract, the Seller or subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. § 15) or under the Cartwright Act, (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the Port tenders final payment to the Seller, without further acknowledgment by the parties.
- 4.2 Port shall have the right to review Seller's design during all phases of design (including schematic, design development and fabrication) including, but not limited to, drawings, specifications, shop drawings, samples and submittals. Such review, approval and other action shall not relieve Seller of its responsibility for a complete design complying with the requirements of the Procurement Documents; but rather, such review shall be in furtherance of the Port's monitoring and accepting the design as developed and issued by the Seller, consistent with these Procurement Documents. Seller's responsibility to manufacture and test the Goods and perform the Special Services in conformance with the Purchase Agreement shall be absolute.



PORT OF OAKLAND

AA-4201 Plans

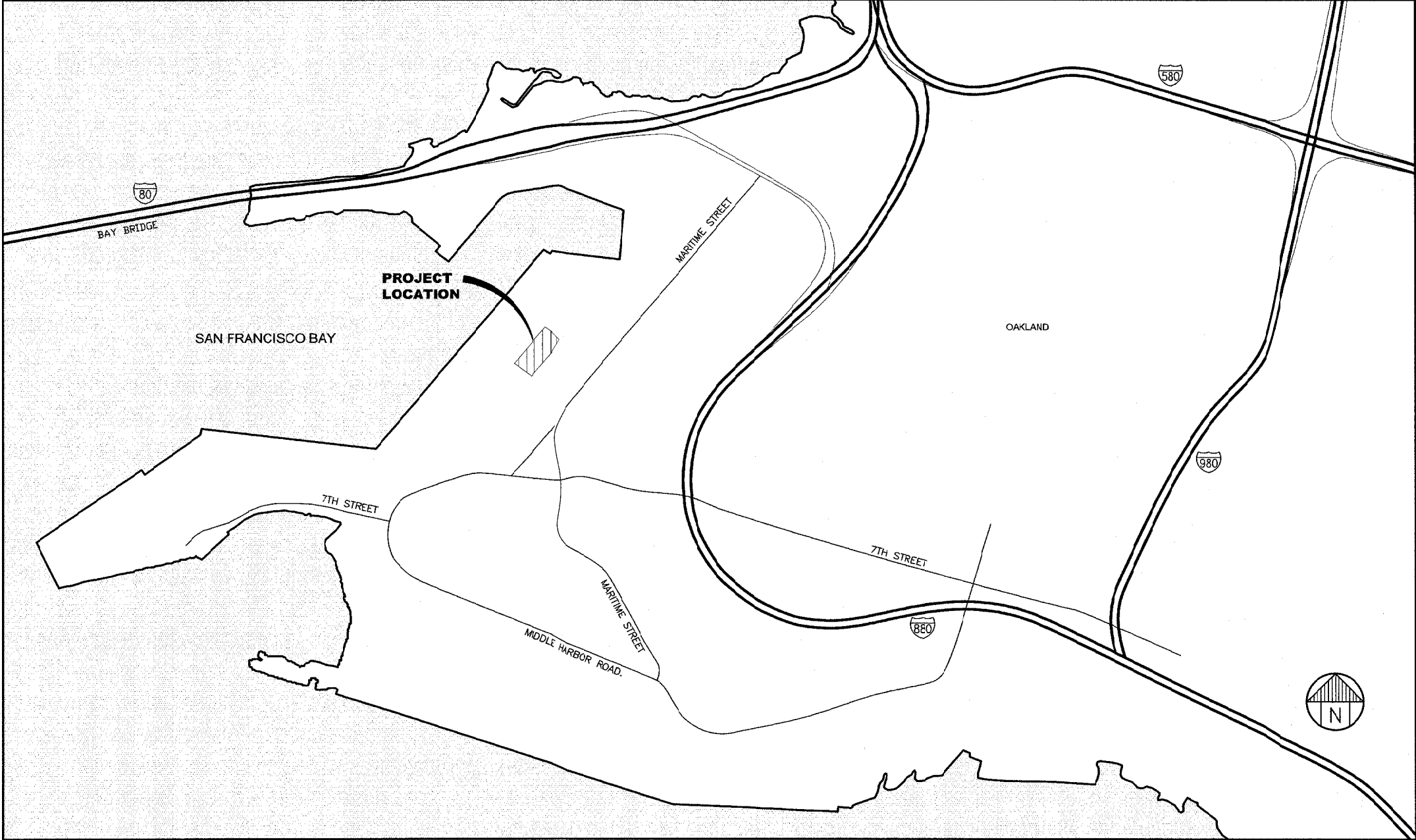
Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

AA-4221 Plans

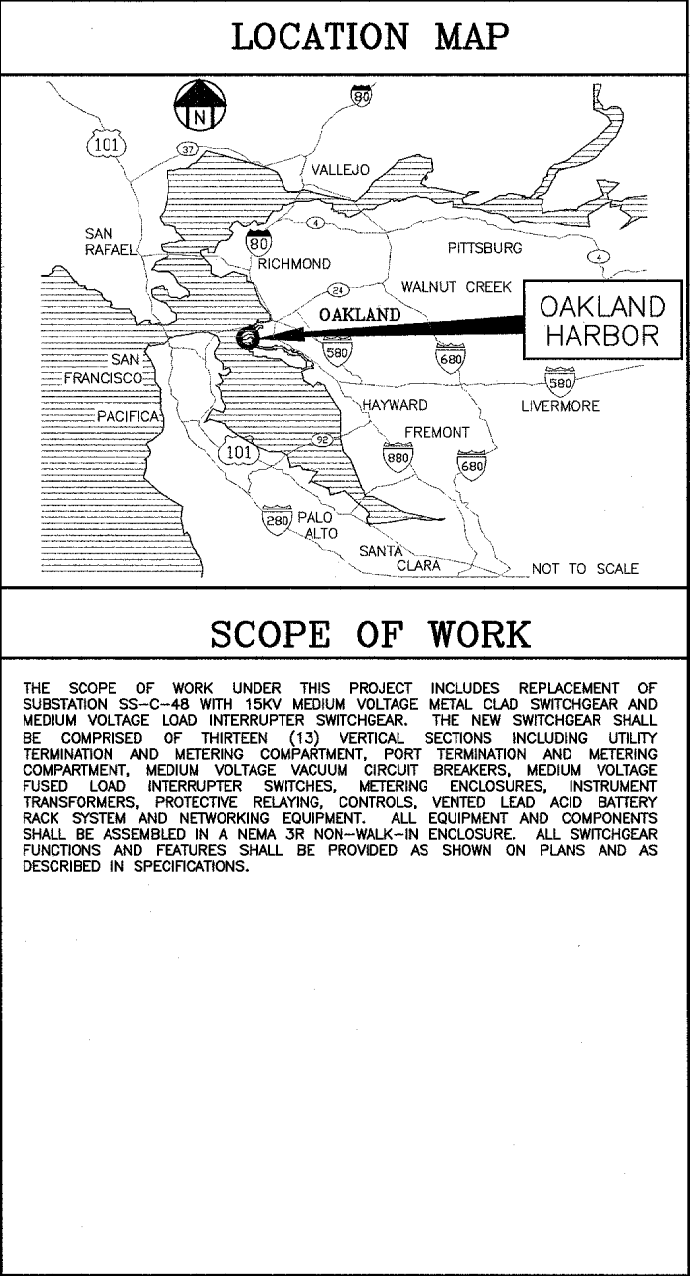
SS-C-48 SWITCHGEAR REPLACEMENT

BERTH 24

OAKLAND, CALIFORNIA



VICINITY MAP
NOT TO SCALE



SCOPE OF WORK

THE SCOPE OF WORK UNDER THIS PROJECT INCLUDES REPLACEMENT OF SUBSTATION SS-C-48 WITH 15KV MEDIUM VOLTAGE METAL CLAD SWITCHGEAR AND MEDIUM VOLTAGE LOAD INTERRUPTER SWITCHGEAR. THE NEW SWITCHGEAR SHALL BE COMPRISED OF THIRTEEN (13) VERTICAL SECTIONS INCLUDING UTILITY TERMINATION AND METERING COMPARTMENT, PORT TERMINATION AND METERING COMPARTMENT, MEDIUM VOLTAGE VACUUM CIRCUIT BREAKERS, MEDIUM VOLTAGE FUSED LOAD INTERRUPTER SWITCHES, METERING ENCLOSURES, INSTRUMENT TRANSFORMERS, PROTECTIVE RELAYING, CONTROLS, VENTED LEAD ACID BATTERY RACK SYSTEM AND NETWORKING EQUIPMENT. ALL EQUIPMENT AND COMPONENTS SHALL BE ASSEMBLED IN A NEMA 3R NON-WALK-IN ENCLOSURE. ALL SWITCHGEAR FUNCTIONS AND FEATURES SHALL BE PROVIDED AS SHOWN ON PLANS AND AS DESCRIBED IN SPECIFICATIONS.

11-07-17 14:43:06 N:\PDDM\2\Projects\2\B 20-26\2222M000027 - Berth 20-24 Electrical Rehabilitation\1-Design\XX-1221 SS-C-48 Switchgear Replacement.dwg Printed by mdeong

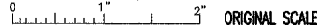
REFERENCES:	
PLANS	
FIELD BOOKS	
"PORT OF OAKLAND DATUM"	
IS 3.20' BELOW M.G.V.D. '29	
CAUTION:	
CHECK TRACING FOR LATEST REVISIONS	

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441
		RES. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698
		RES. ENGINEER NO.


**PORT OF OAKLAND**
530 WATER ST. OAKLAND, CALIFORNIA

CAUTION: THIS PLAN MAY BE REDUCED



CHIEF ENGINEER	
APPROVED	
RECOMMENDED	

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
COVER SHEET AND SHEET INDEX



DATE: 11-07-2017
SCALE: NONE
SHEET: 1 OF 31 SHEETS
E1 AA-4221

SS-C-48 SWITCHGEAR REPLACEMENT
OAKLAND, CALIFORNIA

PROJECT DRAWING INDEX

ELECTRICAL

DRAWING#	DESCRIPTION
E1	COVER SHEET
E2	DRAWING SHEET INDEX
E3	SYMBOLS, LEGEND AND NOTES
E4	DEMOLITION SINGLE LINE DIAGRAM
E5	DEMOLITION SITE PLAN
E6	SINGLE LINE DIAGRAM
E7	SITE PLAN
E8	SWITCHGEAR ELEVATIONS
E9	SWITCHGEAR ELEVATIONS AND PLAN
E10	INCOMING TERMINATIONS SECTIONS DETAILS
E11	SWITCH TERMINATION SECTIONS DETAILS
E12	CIRCUIT BREAKERS CONTROL SECTION LAYOUT
E13	CONTROL/BATTERY CABINET SECTION LAYOUT
E14	THREE LINE DIAGRAM (1 OF 5)
E15	THREE LINE DIAGRAM (2 OF 5)
E16	THREE LINE DIAGRAM (3 OF 5)
E17	THREE LINE DIAGRAM (4 OF 5)
E18	THREE LINE DIAGRAM (5 OF 5)
E19	CB288 CONTROL AND PROTECTION SCHEMATICS
E20	CB322 CONTROL AND PROTECTION SCHEMATICS
E21	ALARM CONTROL SCHEMATICS
E22	AC AND DC PANEL SCHEDULES
E23	AC CONTROL POWER SCHEMATICS
E24	NETWORK DIAGRAM
E25	METER ENCLOSURE DETAILS
E26	NAMEPLATE IDENTIFICATION DETAILS
E27	NAMEPLATE IDENTIFICATION SCHEDULE
E28	PHENOLIC DIAGRAM DETAIL
E29	LIS TERMINAL JUNCTION BOX DETAIL
E30	METER WIRING DETAIL
E31	EXISTING SWITCHGEAR PHOTO DETAILS

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REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
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CAUTION:
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NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698 REG. ENGINEER NO.



CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

CHIEF ENGINEER	C 43841 REG. ENGINEER NO.
APPROVED	C 42009 REG. ENGINEER NO.
RECOMMENDED	E 17400 REG. ENGINEER NO.

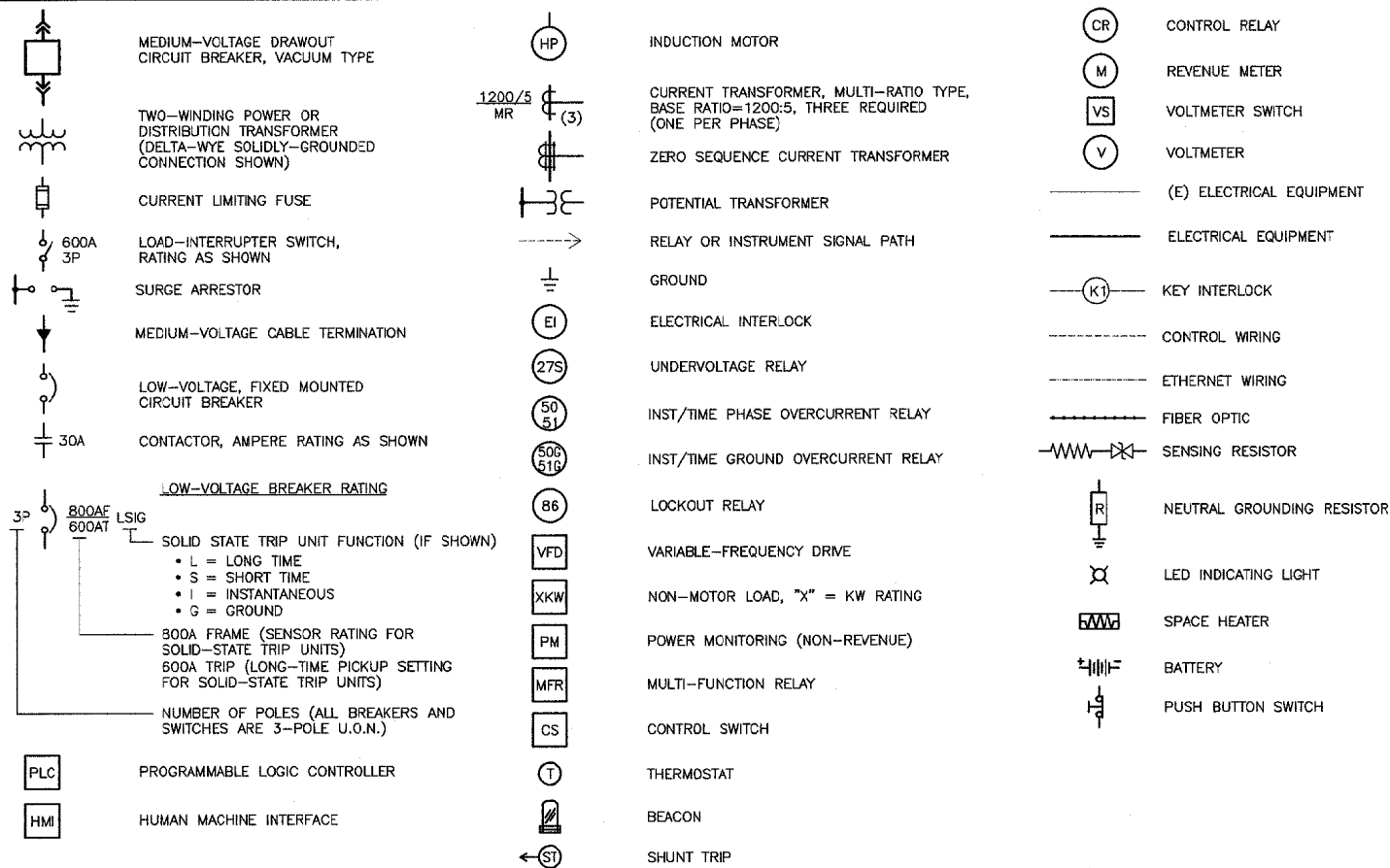
OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
DRAWING SHEET INDEX

DATE: 11-07-2017
SCALE: NONE
SHEET 2 OF 31 SHEETS
E2 AA-4221

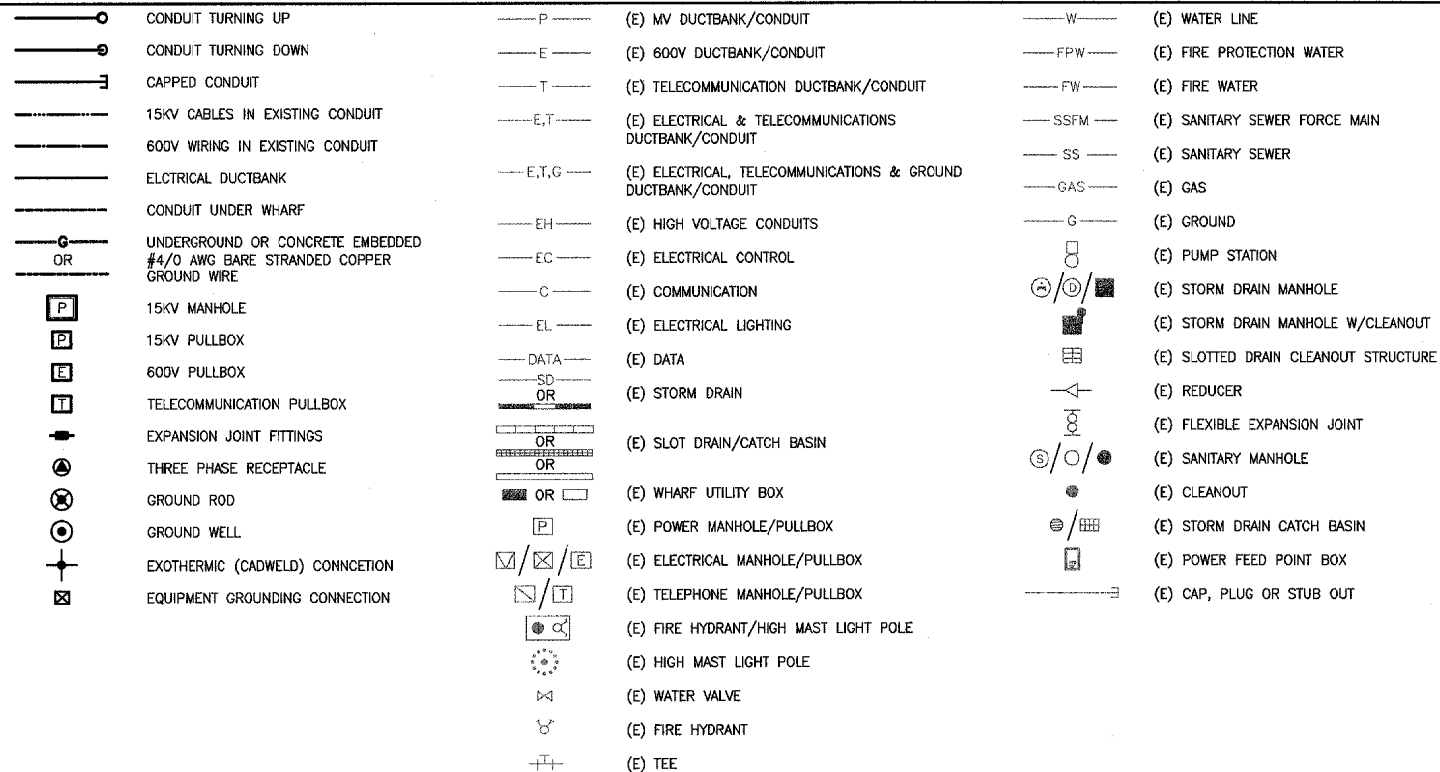
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SYMBOLS & LEGENDS

SINGLE-LINE DIAGRAMS AND SCHEMATICS



PLANS



ABBREVIATIONS

A	AMPERE OR AMPER	MIN	MINIMUM
AA	AIR INSULATED AIR COOLED	MPC	MINI-POWER CENTER
AC	ALTERNATING CURRENT	MR	MULTI-RATIO
AFB	ABOVE FINISHED FLOOR	MTG	MOUNTING
AGG	AGGREGATE	MV	MEDIUM VOLTAGE
AL	ALUMINUM	MVA	MEGAVOLT AMPERE
AM	AMMETER	NC	NORMALLY-CLOSED
AS	AMMETER SWITCH	NEG	NEGATIVE
ATC	AIR TERMINAL CHAMBER	NEUT	NEUTRAL
AUX	AUXILIARY	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NGR	NEUTRAL GROUNDING RESISTOR
		NO	NORMALLY-OPEN
BAT	BATTERY	NTS	NOT TO SCALE
BKR	BREAKER	OA	BASE TRANSFORMER RATING
C	CONDUCTOR OR CONDUIT	OC	OVERCURRENT
CAT5	CATEGORY 5 CABLE	O.D.	OUTSIDE DIAMETER
CB	CIRCUIT BREAKER	OL	OVERLOAD ELEMENT
CD	CONTROLLED DENSITY FILLED		
CHGR	CHARGER	P	POLE
CKT	CIRCUIT	P2C	PERMISSIVE TO CLOSED
C.O.	CONDUIT ONLY	PB	PULLBOX OR PANELBOARD
COMM	COMMUNICATION	PG&E	PACIFIC GAS AND ELECTRIC
CP	CONTROL PANEL	PH	PHASE OR PULLHOLE
CPT	CONTROL POWER TRANSFORMER	PLC	PROGRAMMABLE LOGIC CONTROLLER
CR	CONTROL RELAY	PM	POWER MONITOR
CS	CONTROL SWITCH	PNL	PANEL
CT	CURRENT TRANSFORMER	POS	POSITIVE
CU	COPPER	PRI	PRIMARY
DC	DIRECT CURRENT	PS	PUSHBUTTON STATION
DISC	DISCONNECT	PT	POTENTIAL TRANSFORMER
DR	DOUBLE-RATIO	PVC	POLYVINYL CHLORIDE
DRCT	DUAL-RATIO CURRENT TRANSFORMER	PWR	POWER
DIA	DIAMETER	REC	RECEPTACLE
DWG(S)	DRAWING(S)	REQD	REQUIRED
(E)	EXISTING	RGS	RIGID GALVANIZED STEEL (CONDUIT)
EA	EACH	SCH	SCHEDULE
ELEC	ELECTRICAL	SEC	SECONDARY
EMER	EMERGENCY	SHT	SHEET
E-STOP	EMERGENCY STOP	SN	SOLID NEUTRAL
FDN	FOUNDATION	SP	SPARE
FDR	FEEDER	SPO	SHORE POWER OUTLET
FE	FIRE EXTINGUISHER	ST	SINGLE-THROW OR SHUNT TRIP
FLA	FULL LOAD AMPERES	STA	STATION
FM	FREQUENCY METER	STL	STEEL
FT	FEET	SUBSTA	SUBSTATION
FUT	FUTURE	SW	SWITCH
G	GREEN	SWGR	SWITCHGEAR
GALV	GALVANIZED	SPO	SHORE POWER OUTLETS
GFI	GROUND FAULT CIRCUIT INTERRUPTER	SYNC	SYNCHRONOUS
GFR	GROUND FAULT RELAY	T	TELECOMMUNICATIONS
GND	GROUND	TB	TERMINAL BOX OR TERMINAL BLOCK
GPS	GLOBAL POSITIONING SYSTEM	TDOD	TIME DELAY ON DE-ENERGIZATION
HGR	HANGER	TDCE	TIME DELAY ON ENERGIZATION
HOA	HAND-OFF-AUTOMATIC	TEL	TELEPHONE/TELECOMMUNICATIONS
HMI	HUMAN MACHINE INTERFACE	TERM	TERMINAL
HTR	HEATER	TOC	TOP OF CONCRETE
HV	HIGH-VOLTAGE	TSP	TWISTED-SHIELDED PAIR
HZ	HERTZ (CYCLES PER SECOND)	(TYP)	TYPICAL
ID	INSIDE DIAMETER	UG	UNDERGROUND
IN	INCH	U.O.N.	UNLESS OTHERWISE NOTED
IRIG	INTER-RANGE INSTRUMENTATION GROUP	UV	UNDER VOLTAGE
JB	JUNCTION BOX	V	VOLT
KA	KILOAMP	VA	VOLT AMPERE
KCMIL	THOUSAND CIRCULAR MILS	VAC	VACUUM
KV	KILOVOLT	VM	VOLTMETER
KVA	KILOVOLT AMPERE	VS	VOLTMETER SWITCH
KVAR	KILOVOLT AMPERE REACTIVE	VT	VOLTAGE TRANSFORMER
KW	KILOWATT	W	WATT
LED	LIGHT EMITTING DIODE	WP	WEATHERPROOF
LIS	LOAD INTERRUPTER SWITCH	XFMR	TRANSFORMER
LO	LOCK OUT		
LV	LOW-VOLTAGE		
MAX	MAXIMUM		
MCB	MAIN CIRCUIT BREAKER		
MCCB	MOLDED CASE CIRCUIT BREAKER		
MCM	THOUSAND CIRCULAR MILS		
MCP	MOTOR CIRCUIT PROTECTOR		
MECH	MECHANICAL		
MFR	MULTI-FUNCTION RELAY		
MH	MANHOLE		

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS

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NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
C 43841
C 42009
E 17400
REG. ENGINEER NO.
REG. ENGINEER NO.
REG. ENGINEER NO.

OUTER HARBOR

SS-C-48 SWITCHGEAR REPLACEMENT

SYMBOLS, LEGEND AND NOTES



DATE: 11-07-2017

SCALE: NONE

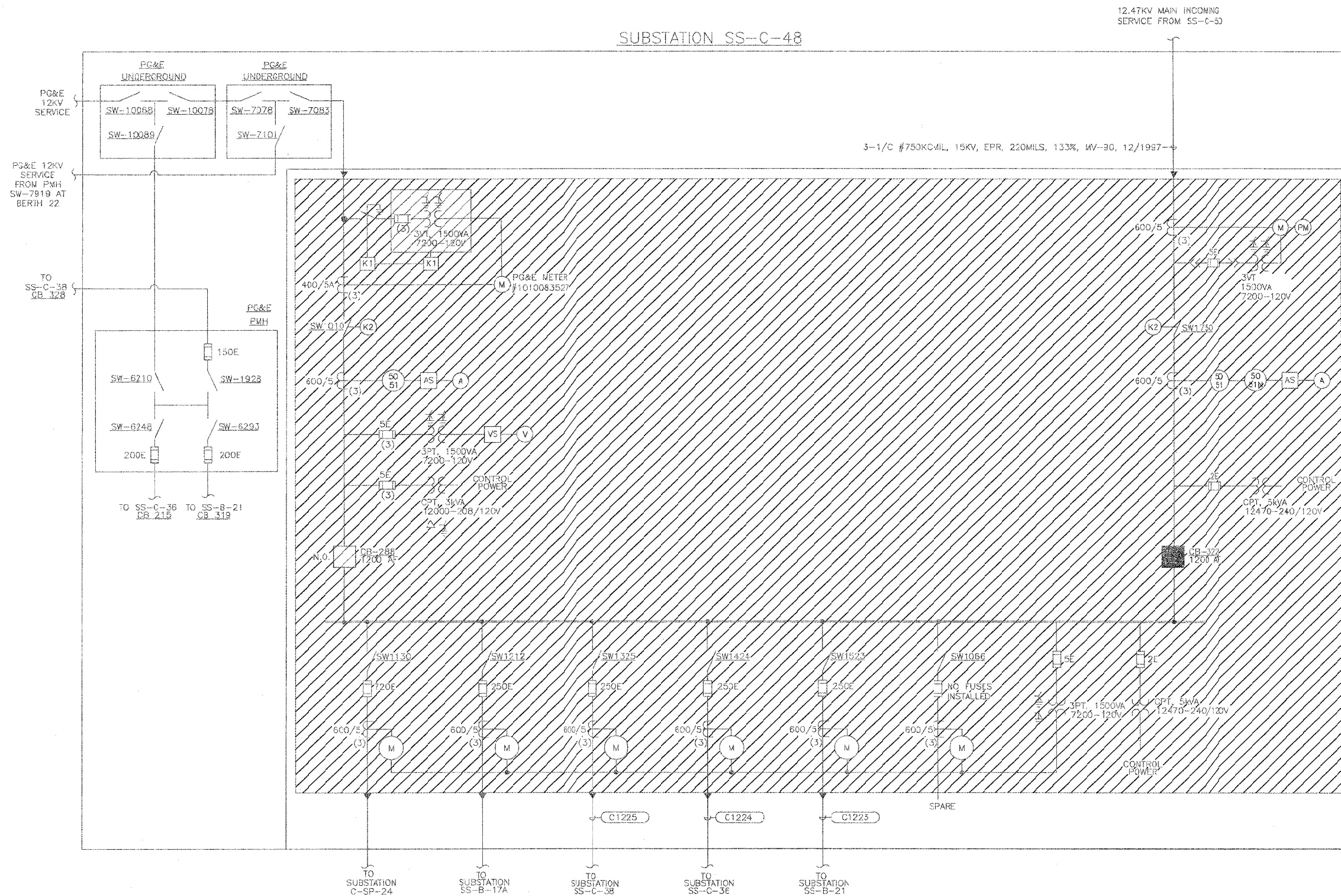
SHEET 3 OF 31 SHEETS

E3 AA-4221

DRAWING GENERAL NOTES

- A. FOR PROJECT GENERAL NOTES, SYMBOLS AND ABBREVIATIONS, SEE DRAWING E3.
- B. PRIOR TO REMOVAL OF SWITCHGEAR, COORDINATE SHUTDOWNS WITH PG&E AND ALL PORT POWER SOURCES FOR DE-ENERGIZATION, GROUNDING, AND LOCKOUT/TAGOUT.
- C. REFER TO DWG E5 FOR DEMOLITION PLANS.

SUBSTATION SS-C-48



CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

PLANS

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PORT OF OAKLAND

530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER

APPROVED

RECOMMENDED

C 43841

C 42009

E 17400

REG. ENGINEER NO.

OUTER HARBOR

SS-C-48 SWITCHGEAR REPLACEMENT

DEMOLITION SINGLE LINE DIAGRAM



DATE: 11-07-2017

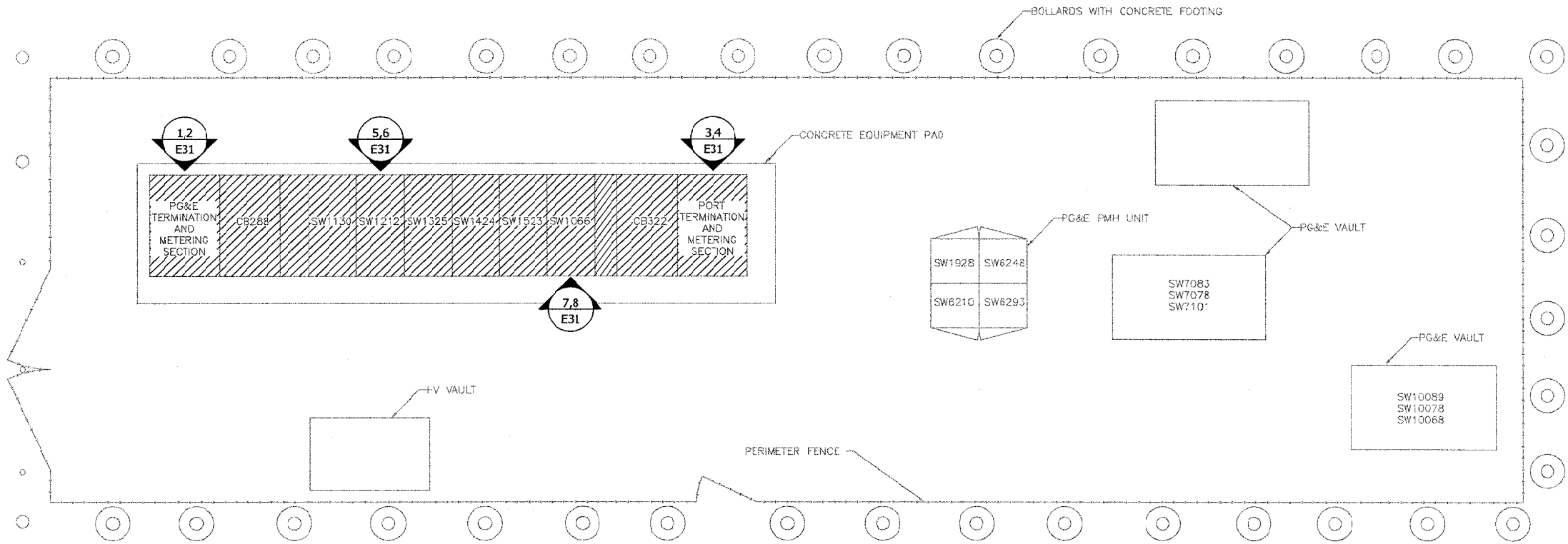
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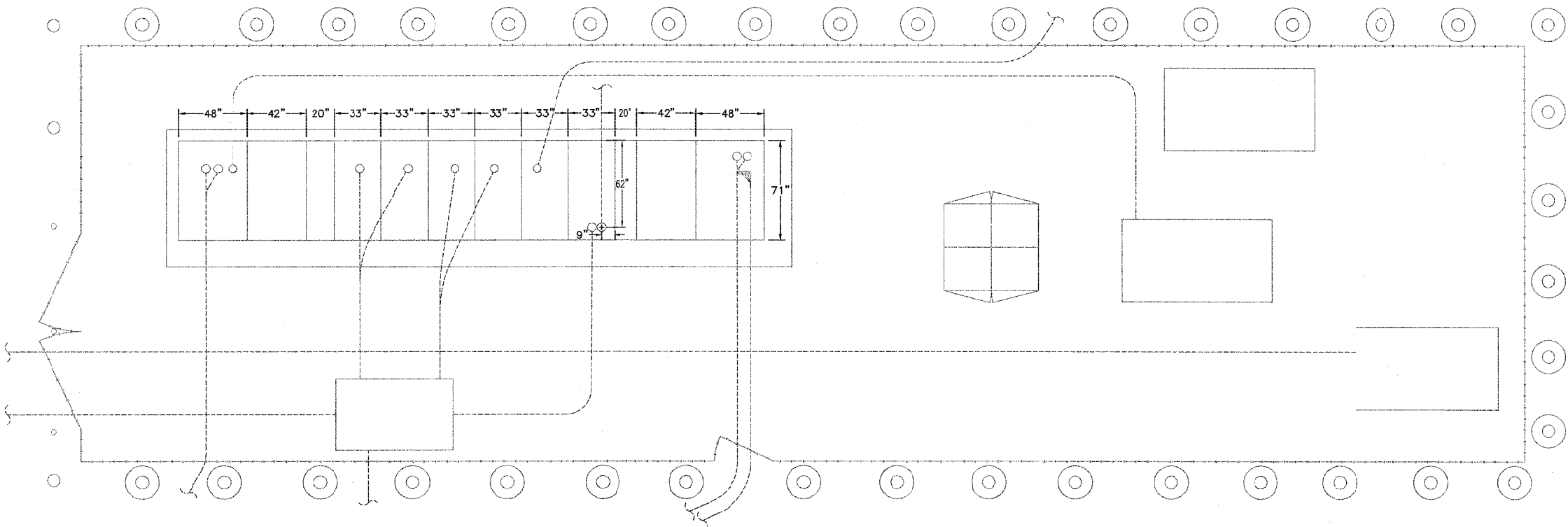
E4 AA-4221

DRAWING GENERAL NOTES

- A. PRIOR TO REMOVAL OF SWITCHGEAR, COORDINATE SHUTDOWNS FOR PG&E AND ALL PORT POWER SOURCES FOR DE-ENERGIZATION, GROUNDING, AND LOCKOUT/TAGOUT.
- B. EXISTING UNDERGROUND ELECTRICAL UTILITY INFORMATION IS PROVIDED FOR GENERAL INFORMATION ONLY. THIS INFORMATION IS THE BEST AVAILABLE TO THE PORT AND IS NOT NECESSARILY COMPLETE.
- C. PROTECT IN PLACE ALL CONDUCTORS TO BE REUSED AND RECONNECTED TO NEW SWITCHGEAR.



SUBSTATION SS-C-48 EQUIPMENT LAYOUT
SCALE: 1/4"=1'-0"



SUBSTATION SS-C-48 CONDUIT LAYOUT
SCALE: 1/4"=1'-0"

CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
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NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441
CHECKED	W. YEOMAN	E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

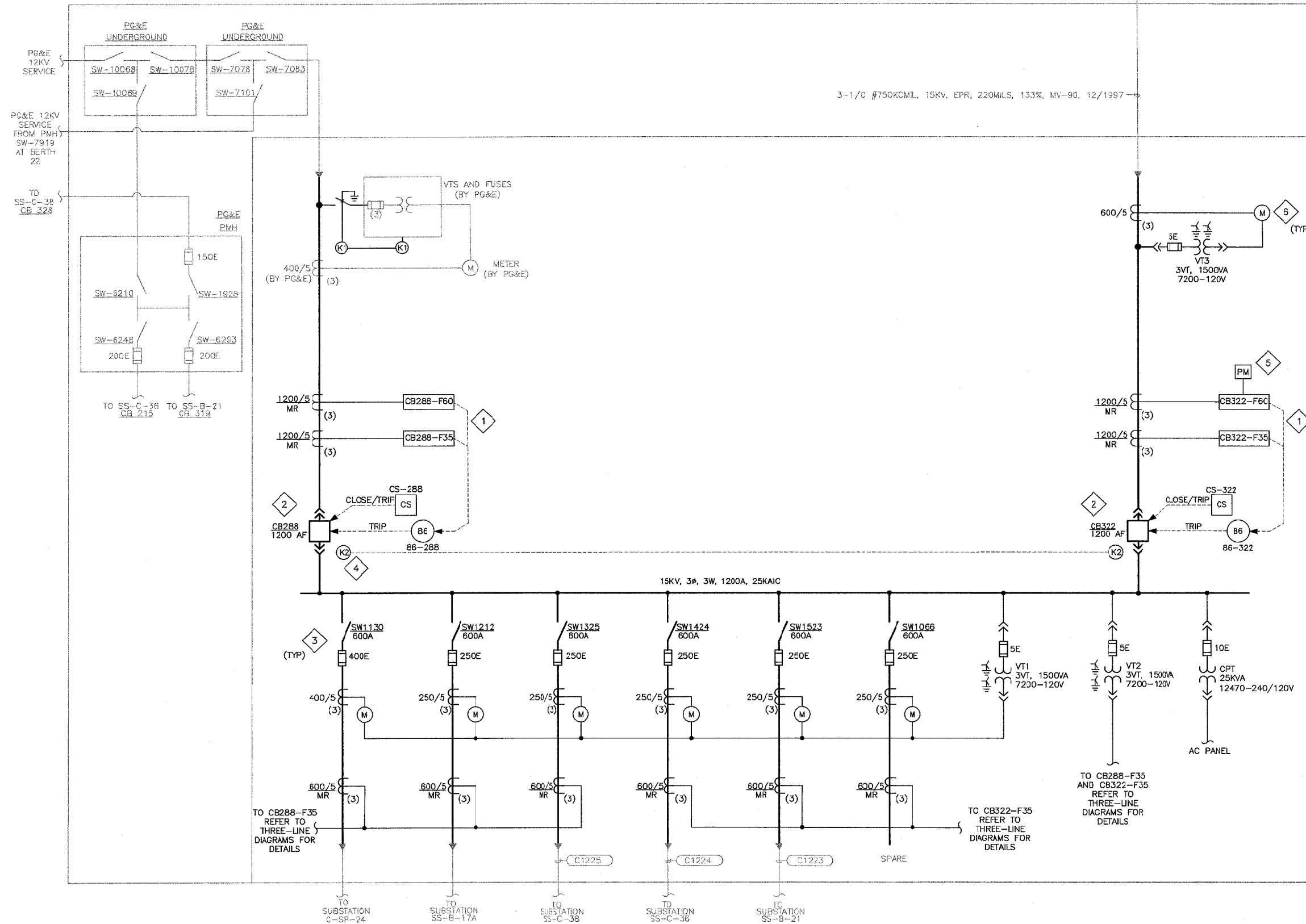
CHEF ENGINEER	
APPROVED	
RECOMMENDED	

OUTER HARBOR	
SS-C-48 SWITCHGEAR REPLACEMENT	
DEMOLITION SITE PLAN	

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
STATE OF CALIFORNIA

DATE: 11-07-2017
SCALE: AS SHOWN
SHEET: 5 OF 31 SHEETS
E5 AA-4221

12.47KV MAIN INCOMING
SERVICE FROM SS-C-50



- A. FOR PROJECT GENERAL NOTES, SYMBOLS AND ABBREVIATIONS, SEE DRAWING E3.
- B. REFER TO SPECIFICATIONS FOR ALL SWITCHGEAR AND COMPONENT REQUIREMENTS.
- C. SWITCHGEAR MANUFACTURER SHALL DESIGN AND FABRICATE UTILITY SERVICE TERMINATION AND METERING COMPARTMENT AS SHOWN IN THESE PLANS, DESCRIBED IN THE SPECIFICATIONS, AND IN ACCORDANCE TO PG&E AND EUSERC REQUIREMENTS.
- D. NOT ALL COMPONENTS AND DETAILS ARE SHOWN ON THIS SINGLE LINE DIAGRAM. REFER TO PROJECT SPECIFICATIONS AND DRAWINGS INCLUDED IN THIS PLAN SET.

- 1 GE MULTILIN F35 AND F60 PROTECTION RELAYS. REFER TO SPECIFICATIONS FOR FEATURES AND PART NUMBER.
- 2 CB288 AND CB322 SHALL BE DRAWOUT TYPE. SQUARE D, VR, 15KV, 1200A, 125VDC CONTROL, P/N VR-15050-12. SWITCHGEAR MANUFACTURER SHALL PROVIDE CUSTOM RAMP TO WITHDRAW BREAKER FROM SWITCHGEAR CUBICLE TO EQUIPMENT PAD LEVEL. RAMP SHALL BE CONSTRUCTED OF ALUMINUM.
- 3 FUSED LOAD INTERRUPTER SWITCH: 600A, 15KV, NEMA 3R ENCLOSURE.
- 4 MECHANICAL KEY INTERLOCK BETWEEN CB288 AND CB322 BREAKER CELLS. THIS INTERLOCK SHALL ALLOW ONLY ONE CIRCUIT BREAKER TO BE RACKED IN AT ANY TIME.
- 5 ELECTRO INDUSTRIES SHARK 200 POWER MONITOR. REFER TO SPECIFICATIONS.
- 6 CENTRON ITRON REVENUE METER. REFER TO SPECIFICATIONS.

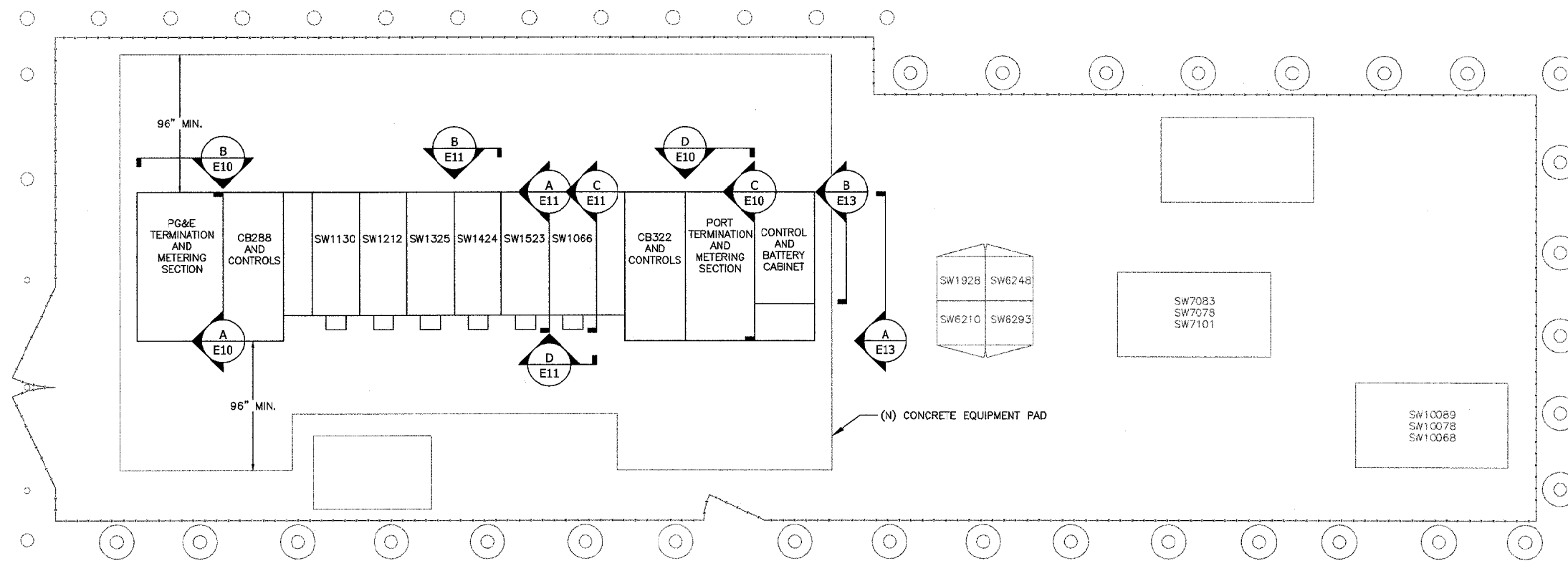
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REFERENCES: 11-07-2017 PLANS FIELD BOOKS "PORT OF OAKLAND DATUM" IS 3.20' BELOW N.G.V.D. '29 CAUTION: CHECK TRACING FOR LATEST REVISIONS	NO.	REVISIONS	DATE	REV'D	APP'D	DRAWN M. LEONG DESIGNED M. LEONG E 21441 RES. ENGINEER NO. CHECKED W. YEOMAN E 17698 RES. ENGINEER NO.	<div>PORT OF OAKLAND</div> <div> 530 WATER ST. OAKLAND, CALIFORNIA</div>	CHEF ENGINEER  C 43841 RES. ENGINEER NO. APPROVED  for June 10 C 42009 RES. ENGINEER NO. RECOMMENDED  E 17400 RES. ENGINEER NO.		OUTER HARBOR DATE: 11-07-2017	
								SS-C-48 SWITCHGEAR REPLACEMENT SCALE: NONE			
								SHEET: 6 OF 31 SHEETS			
								SINGLE LINE DIAGRAM E6 AA-4221			

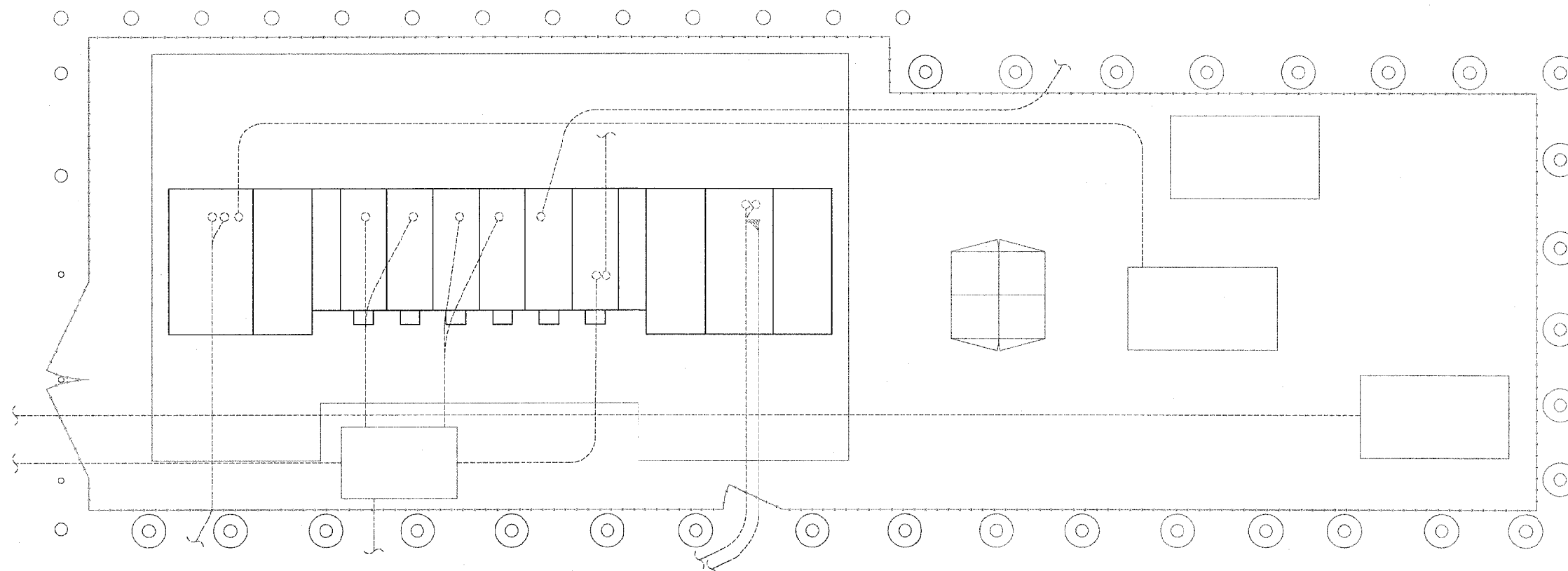
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DRAWING GENERAL NOTES

- A. FOR PROJECT GENERAL NOTES, SYMBOLS AND ABBREVIATIONS, SEE DRAWING E3.
- B. EXISTING UNDERGROUND ELECTRICAL UTILITY INFORMATION IS PROVIDED FOR GENERAL INFORMATION ONLY. THIS INFORMATION IS THE BEST AVAILABLE TO THE PORT AND IS NOT NECESSARILY COMPLETE.
- C. REFER TO E8 AND E9 FOR EQUIPMENT ELEVATIONS AND LAYOUT.



SUBSTATION SS-C-48 EQUIPMENT LAYOUT
SCALE: 1/4"=1'-0"



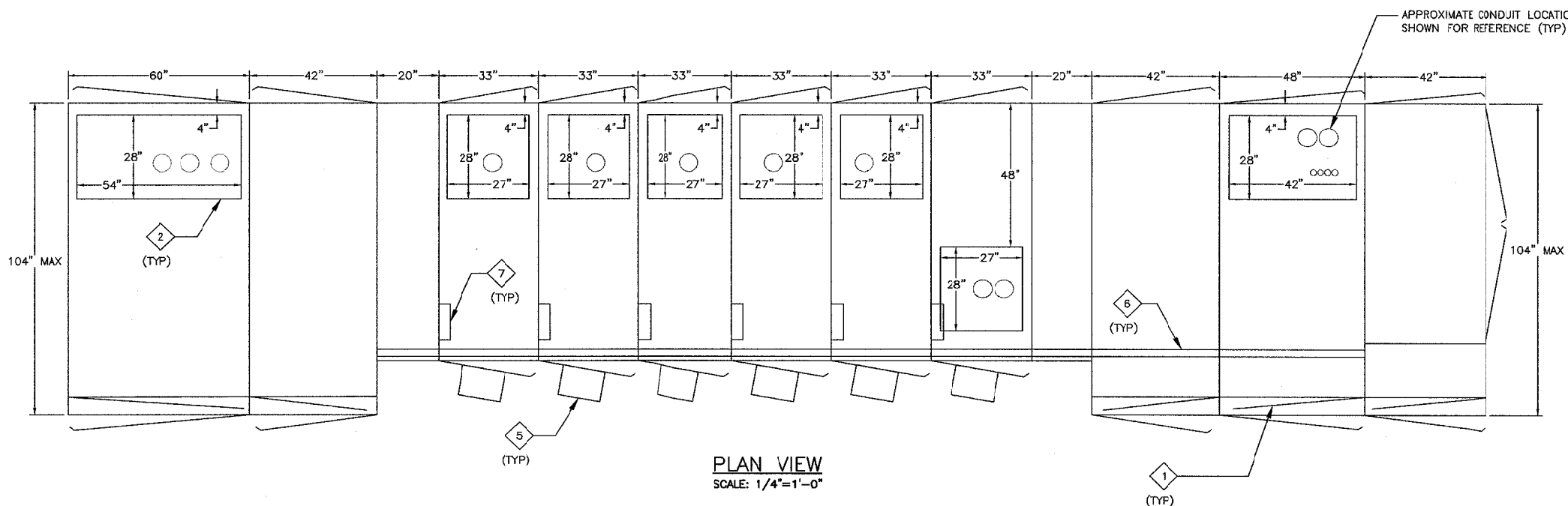
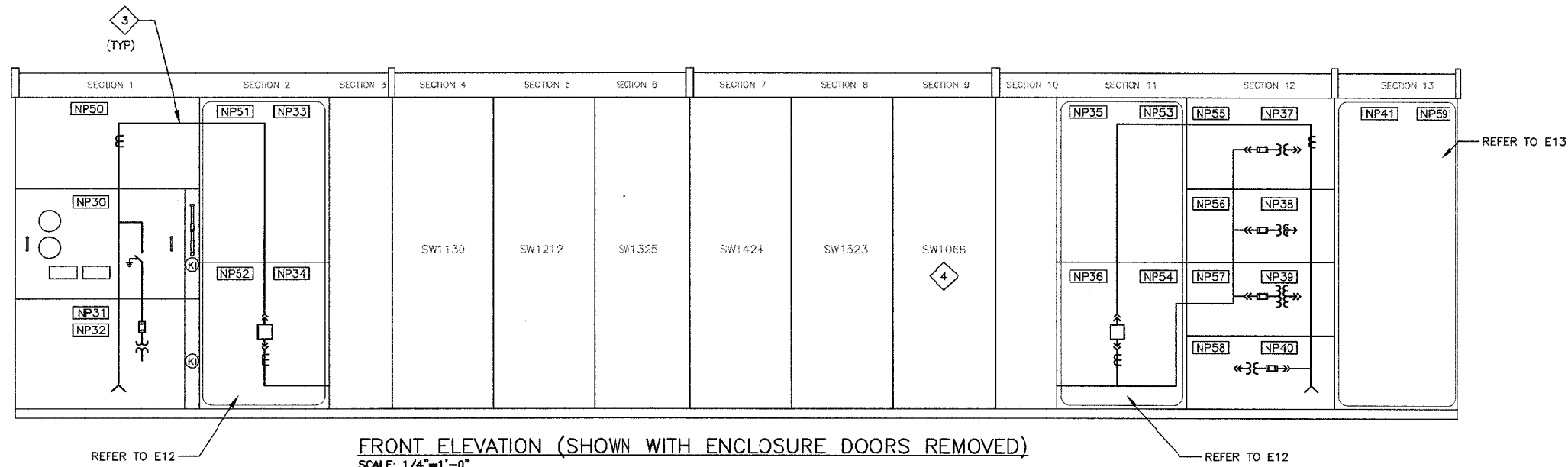
SUBSTATION SS-C-48 CONDUIT LAYOUT
SCALE: 1/4"=1'-0"

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES: PLANS FIELD BOOKS "PORT OF OAKLAND DATUM" IS 3.20' BELOW M.G.V.D. '29 CAUTION: CHECK TRACING FOR LATEST REVISIONS	NO.	REVISIONS	DATE	REV'D	APP'D	DRAWN M. LEONG DESIGNED M. LEONG E 21441 REG. ENGINEER NO. CHECKED W. YEOMAN E 17698 REG. ENGINEER NO.	PORT OF OAKLAND 530 WATER ST. OAKLAND, CALIFORNIA	CHIEF ENGINEER C 43841 REG. ENGINEER NO. APPROVED C 42009 REG. ENGINEER NO. RECOMMENDED E 17400 REG. ENGINEER NO.	OUTER HARBOR	DATE: 11-07-2017
									SS-C-48 SWITCHGEAR REPLACEMENT	SCALE: AS SHOWN
									SITE PLAN	SHEET: 7 OF 31 SHEETS
									E7	AA-4221

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DRAWING GENERAL NOTES

- REFER TO SPECIFICATIONS FOR ALL SWITCHGEAR AND COMPONENT REQUIREMENTS.
- SWITCHGEAR MANUFACTURER SHALL DESIGN AND FABRICATE UTILITY SERVICE TERMINATION AND METERING COMPARTMENT AS SHOWN IN THESE PLANS, DESCRIBED IN THE SPECIFICATIONS, AND IN ACCORDANCE TO PG&E AND EUSERC REQUIREMENTS.
- EQUIPMENT LAYOUTS SHOWING COMPONENT, LABELS/IDENTIFICATION LOCATIONS ARE APPROXIMATIONS. SWITCHGEAR MANUFACTURER SHALL SUBMIT DETAILED DIMENSIONED LAYOUTS FOR APPROVAL PRIOR TO FABRICATION.
- REFER TO DWG E26 FOR NAMEPLATE IDENTIFICATION REQUIREMENTS.
- SWITCHGEAR MANUFACTURER SHALL NOT AFFIX ANY LABELS OR IDENTIFICATION NOT SHOWN ON THESE DRAWINGS WITHOUT PRIOR CONSENT FROM ENGINEER.

SHEET NOTES

- ALL INTERIOR CONTROL COMPARTMENT DOORS (SECTIONS 2, 11, 12, 13) SHALL BE CAPABLE OF OPENING DOORS COMPLETELY 180 DEGREES WITHOUT OBSTRUCTING WITHDRAWABLE COMPONENTS.
- PROVIDE CABLE/CONDUIT ENTRY CUTOUTS AS INDICATED. SWITCHGEAR SHALL BE DELIVERED WITH CABLE COMPARTMENTS FULLY CLOSED WITH COVER PLATES SECURED.
- PROVIDE MIMIC BUS AS SHOWN. REFER TO SPECIFICATIONS FOR REQUIREMENTS AND ATTACHMENT METHODS.
- SW1066 SHALL BE DESIGNED AND FABRICATED TO ALLOW FOR CABLE TERMINATIONS IN THE FRONT. REFER TO DETAIL C/E10 AND DETAIL D/E10.
- PROVIDE EXTERIOR METER SOCKET ENCLOSURE. REFER TO E25 FOR DETAILS.
- PROVIDE LAY-IN, SCREW COVERED, SURFACE MOUNTED WIREWAY SYSTEM FOR LOW VOLTAGE WIRING BETWEEN SWITCHGEAR SECTIONS. WIREWAYS SHALL EXTEND THROUGH ALL SECTIONS OF SWITCHGEAR FOR WIRING OF ALL POWER, CONTROL, METERING AND INSTRUMENTATION CIRCUITS. SWITCHGEAR MANUFACTURER SHALL DESIGN WIREWAY DIMENSIONS AND LOCATIONS TO ACCOMMODATE ALL WIRING INCLUDING 25% SPARE CAPACITY FOR FUTURE WIRING.
- PROVIDE TERMINAL JUNCTION BOX IN LOAD INTERRUPTER SWITCHGEAR SECTIONS. REFER TO E29 FOR DETAILS. SWITCHGEAR MANUFACTURER SHALL DESIGN JUNCTION BOX DIMENSIONS AND INSTALL IN ACCESSIBLE LOCATIONS FOR FIELD INTERCONNECTION AND FUTURE WIRE CONNECTIONS.

REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW M.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

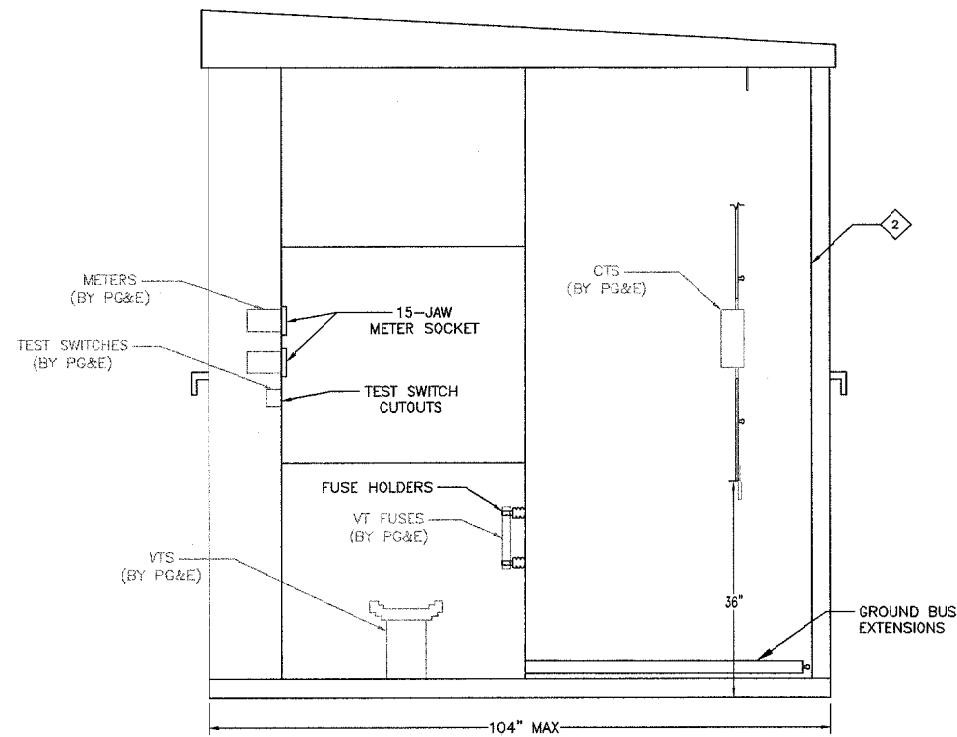
DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

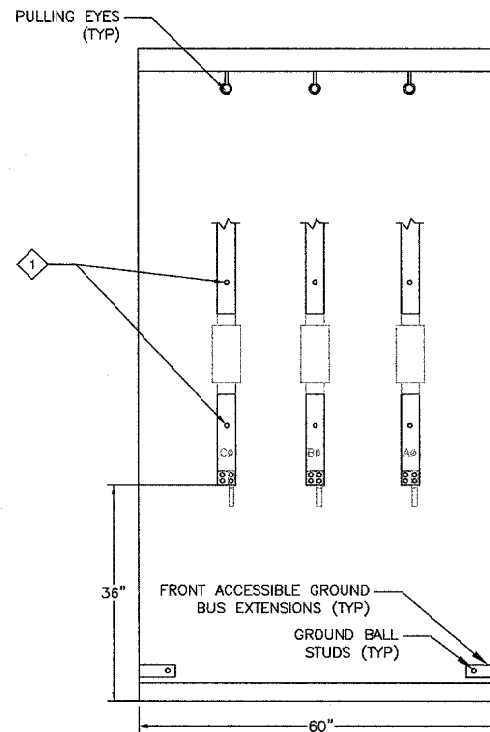
CAUTION: THIS PLAN MAY BE REDUCED
0 1 2 ORIGINAL SCALE
CHIEF ENGINEER
APPROVED
RECOMMENDED

OUTER HARBOR	DATE: 11-07-2017
SS-C-48 SWITCHGEAR REPLACEMENT	SCALE: AS SHOWN
SWITCHGEAR ELEVATIONS AND PLAN	SHEET: 9 OF 31 SHEETS
E9	AA-4221

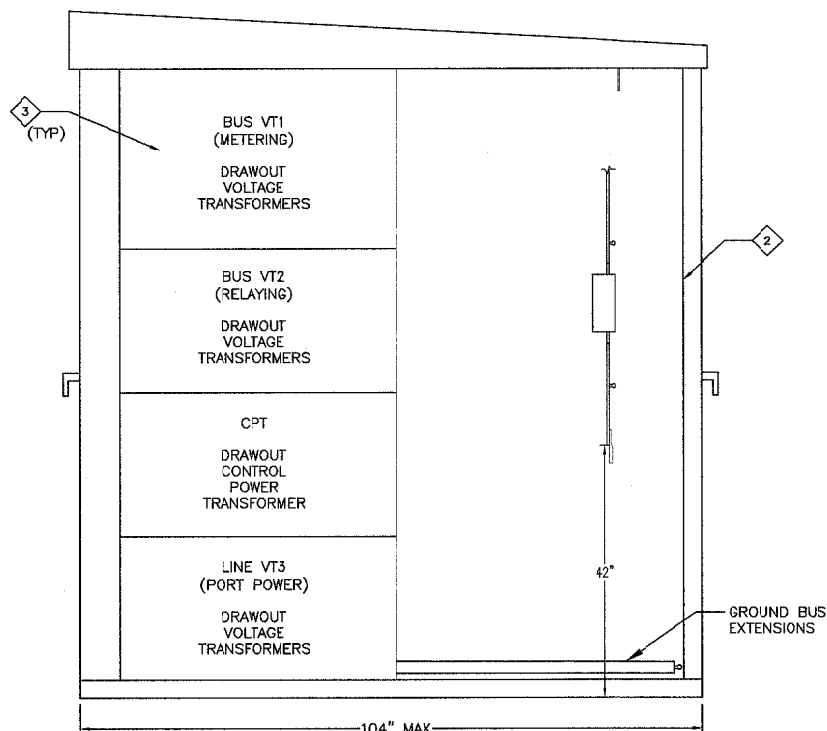




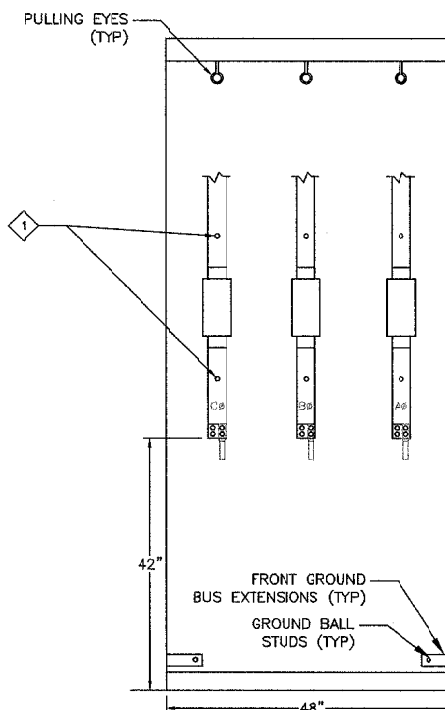
A SECTION 1 UTILITY TERMINATION SECTION
SECTION VIEW
SCALE: 3/4"=1'-0"



B SECTION 1 UTILITY TERMINATION SECTION REAR VIEW
(SHOWN WITH ENCLOSURE DOOR REMOVED)
SCALE: 3/4"=1'-0"



C SECTION 12 PORT TERMINATION SECTION
SECTION VIEW
SCALE: 3/4"=1'-0"



D SECTION 12 PORT TERMINATION SECTION REAR VIEW
(SHOWN WITH ENCLOSURE DOOR REMOVED)
SCALE: 3/4"=1'-0"

DRAWING GENERAL NOTES

- REFER TO SPECIFICATIONS FOR ADDITIONAL IDENTIFICATION REQUIREMENTS.
- SWITCHGEAR MANUFACTURER SHALL DESIGN AND FABRICATE SERVICE TERMINATION AND METERING COMPARTMENTS AS SHOWN IN THESE PLANS, DESCRIBED IN THE SPECIFICATIONS, AND IN ACCORDANCE TO PG&E AND EUSERC REQUIREMENTS.

SHEET NOTES

- GROUND BALL STUDS ON LINE AND LOAD SIDE OF CT BUS.
- PROVIDE TRANSPARENT, INSULATED INNER DOOR CONSTRUCTED OF SOLID PIECE OF CLEAR ACRYLIC RESISTANT TO IMPACT/PUNCTURE DAMAGE. ENSURE ACRYLIC IS RATED FOR THE VOLTAGE SERVED. THE SAFETY DOOR MUST EXTEND FROM THE TOP TO THE BOTTOM OF THE SECTION, COVERING ALL ENERGIZED PARTS AND MAINTAINING ALL CLEARANCES REQUIRED. THE DOOR MUST BE OPERABLE WITH HINGES ON ONE SIDE WITH HANDLES AND PROVISIONS ON THE OPPOSITE SIDE TO SECURE THE DOOR IN THE OPEN OR CLOSED POSITION.
- VOLTAGE TRANSFORMERS AND CONTROL POWER TRANSFORMERS SHALL BE DRAWOUT-TYPE, CAPABLE OF BEING FULLY WITHDRAWN HORIZONTALLY FROM THE SWITCHGEAR ASSEMBLY FOR MAINTENANCE TASKS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS

"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29

CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN **V. LEONG**
DESIGNED **V. LEONG** E 21441
CHECKED **W. YEOMAN** E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER

APPROVED *Chris Chan* C 43841
RECOMMENDED *Chris Chan* C 42009
REG. ENGINEER NO.
REG. ENGINEER NO.

OUTER HARBOR

SS-C-48 SWITCHGEAR REPLACEMENT

INCOMING TERMINATIONS SECTIONS DETAILS



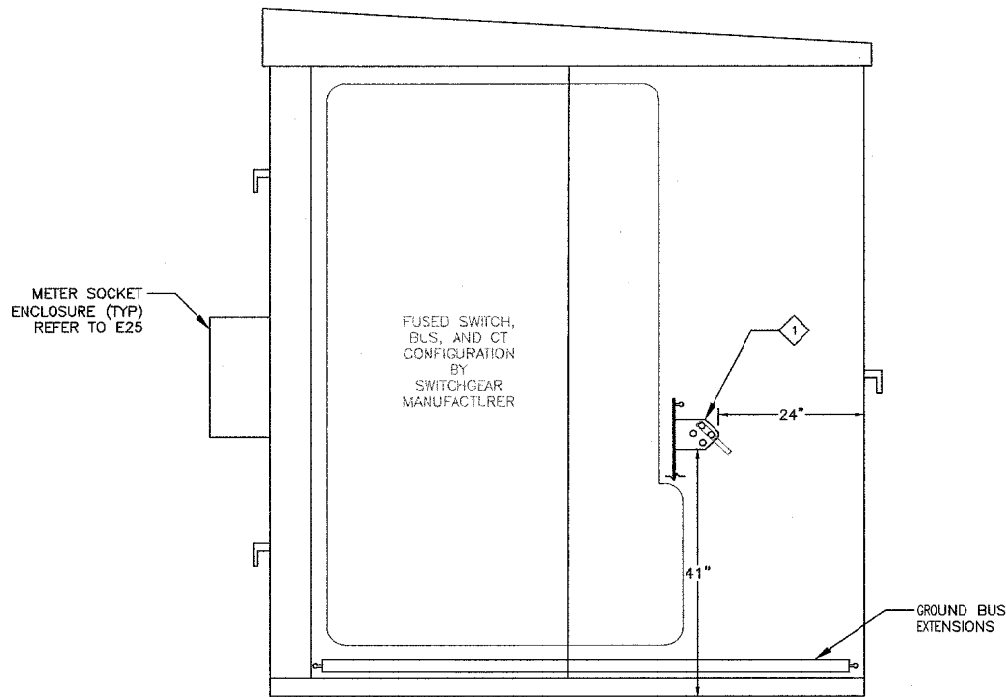
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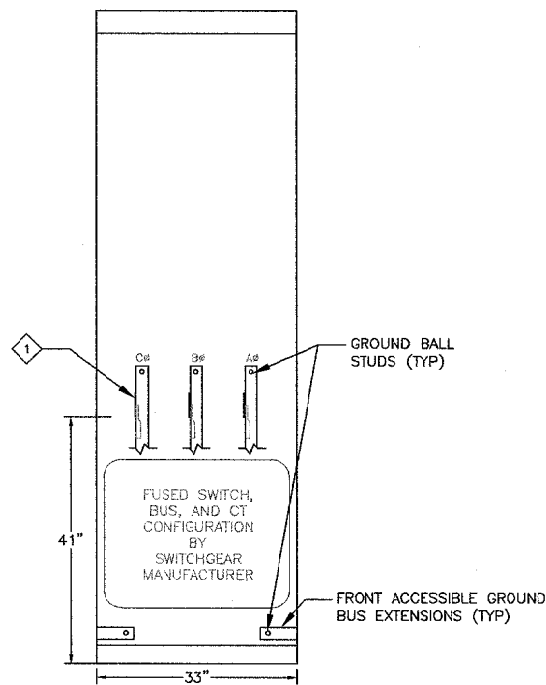
SHEET: 10 OF 31 SHEETS

E10 AA-4221

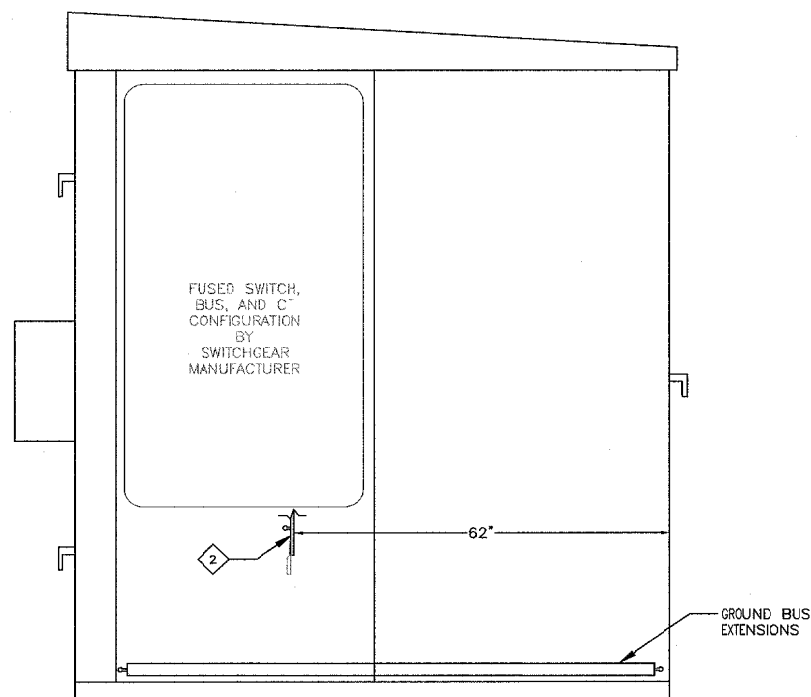
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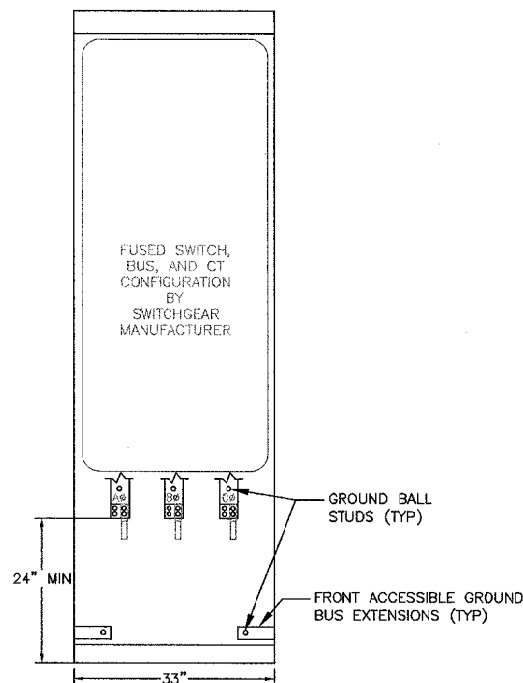
A
E7 E11
SWITCH SW1130,1212,1325,1424,1523 TERMINATION DETAILS SECTION VIEW
SCALE: 3/4"=1'-0"



B
E7 E11
SWITCH SW1130,1212,1325,1424,1523 REAR TERMINATION DETAILS REAR VIEW (SHOWN WITH ENCLOSURE REAR DOOR REMOVED)
SCALE: 3/4"=1'-0"



C
E7 E11
SWITCH SW1066 TERMINATION DETAILS SECTION VIEW
SCALE: 3/4"=1'-0"



D
E7 E11
SWITCH SW1066 FRONT TERMINATION DETAILS FRONT VIEW (SHOWN WITH ENCLOSURE FRONT DOOR REMOVED)
SCALE: 3/4"=1'-0"

DRAWING GENERAL NOTES

- A. REFER TO SPECIFICATIONS FOR ADDITIONAL IDENTIFICATION REQUIREMENTS.
- B. SWITCHGEAR MANUFACTURER SHALL DESIGN AND FABRICATE UTILITY SERVICE TERMINATION AND METERING COMPARTMENT AS SHOWN IN THESE PLANS, DESCRIBED IN THE SPECIFICATIONS, AND IN ACCORDANCE TO PG&E AND EUSERC REQUIREMENTS.

SHEET NOTES

1. LOAD INTERRUPTER SWITCHGEAR LOAD TERMINATION LANDINGS SHALL BE ORIENTED AS SHOWN (REFER TO EXISTING SWITCHGEAR DETAIL 5 AND DETAIL 6 ON E31 FOR REFERENCE).
2. SW1066 SHALL BE DESIGNED AND FABRICATED TO ALLOW FOR LOAD CABLE TERMINATIONS TO BE CONNECTED IN THE FRONT AS SHOWN. REFER TO SITE PLAN CONDUIT LAYOUT FOR LOCATION OF CABLE ENTRY.

CAUTION: THIS PLAN MAY BE REDUCED

0 1 2" ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW M.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
REG. ENGINEER NO. C 43841
REG. ENGINEER NO. C 42009
REG. ENGINEER NO. E 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
SWITCH TERMINATION SECTIONS DETAILS

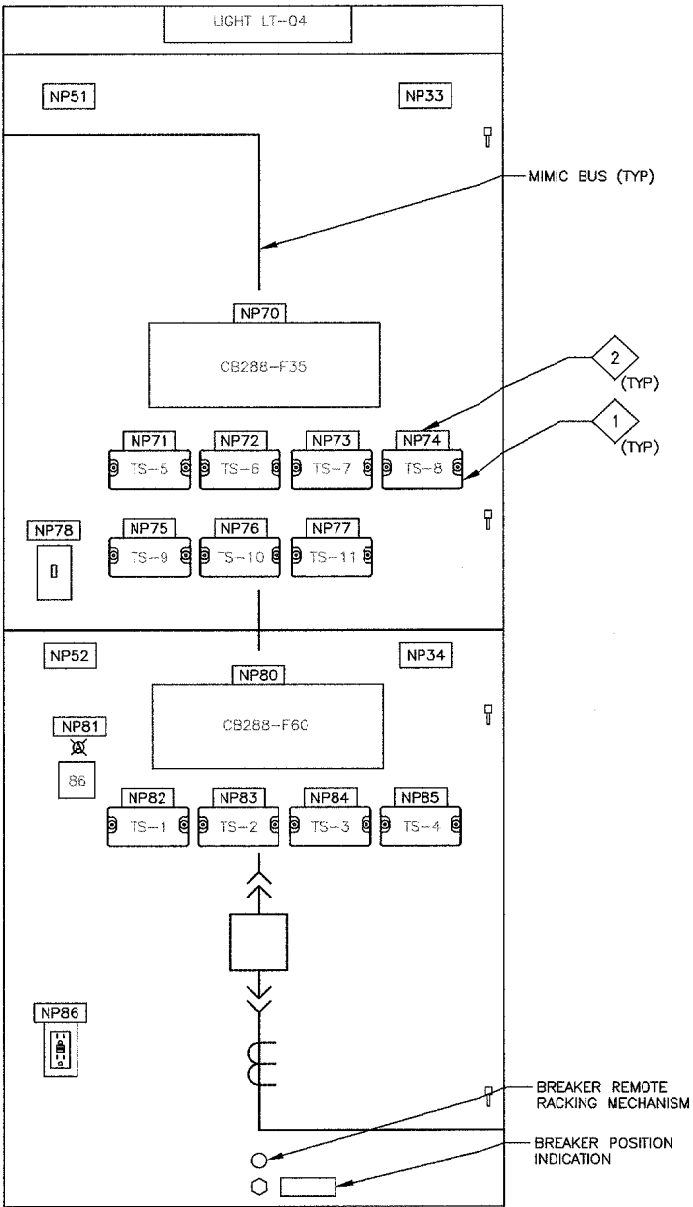
REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-16
DATE: 11-07-2017
SCALE: AS SHOWN
SHEET: 11 OF 31 SHEETS
E11 AA-4221

DRAWING GENERAL NOTES

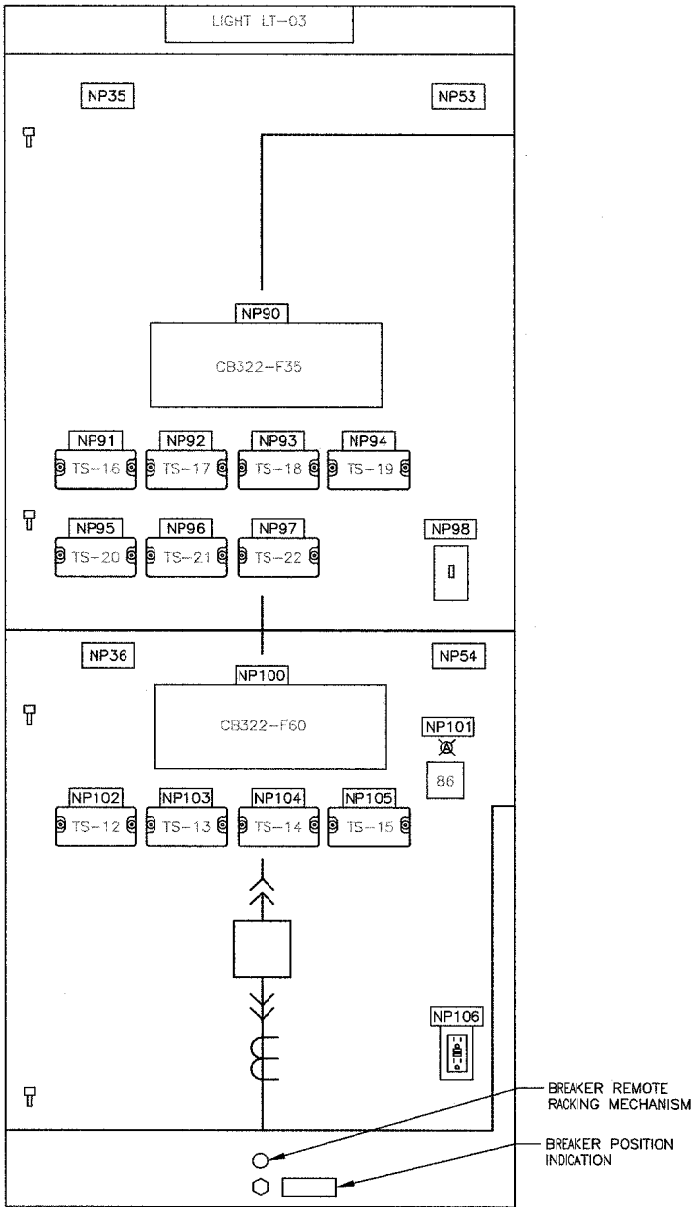
- A. REFER TO SPECIFICATIONS FOR ADDITIONAL IDENTIFICATION REQUIREMENTS.
- B. ALL PHENOLIC NAMEPLATES SHALL BE WHITE BACKGROUND WITH BLACK CORE.

SHEET NOTES

- 1 10-POLE TEST SWITCH ABE FT-1 TYPE OR APPROVED EQUAL. REFER TO SPECIFICATION FOR REQUIREMENTS.
- 2 REFER TO SPECIFICATIONS FOR TEST SWITCH REQUIREMENTS. TEST SWITCH NAMEPLATE SHALL BE PROVIDE IDENTIFICATION AND FUNCTIONAL DESCRIPTION. REFER TO E26 FOR DETAILS.



SECTION 2 - CB288 CONTROL LAYOUT
(SHOWN WITH ENCLOSURE DOORS REMOVED)
SCALE: 3/2"=1'-0"



SECTION 11 - CB322 CONTROL LAYOUT
(SHOWN WITH ENCLOSURE DOORS REMOVED)
SCALE: 3/2"=1'-0"

CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

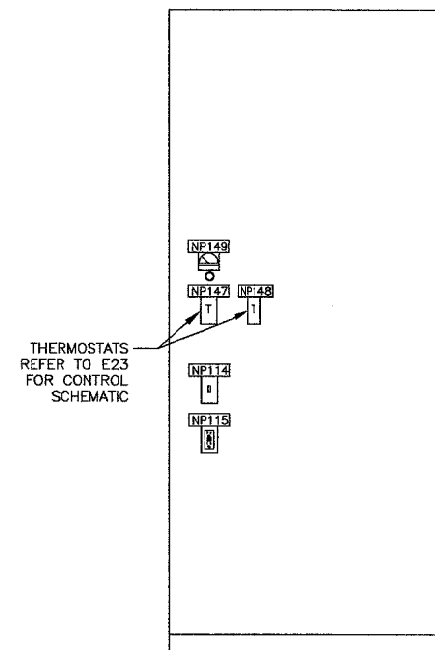
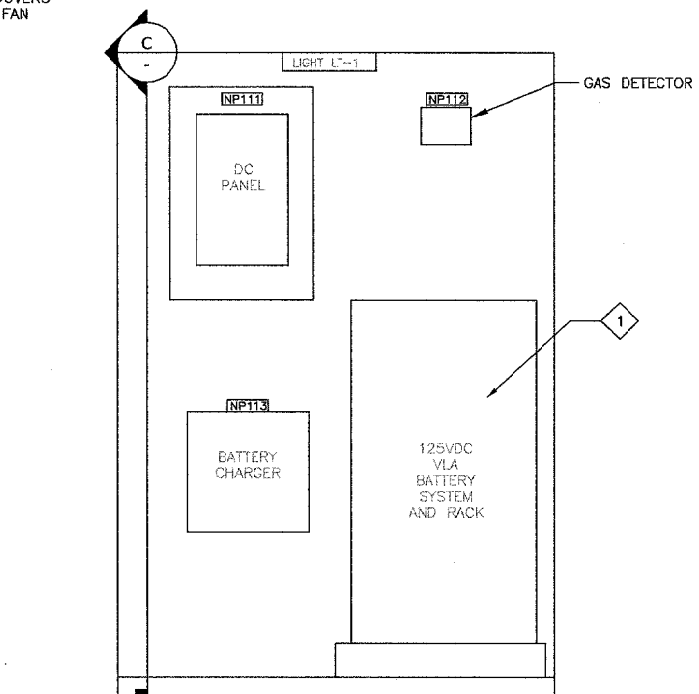
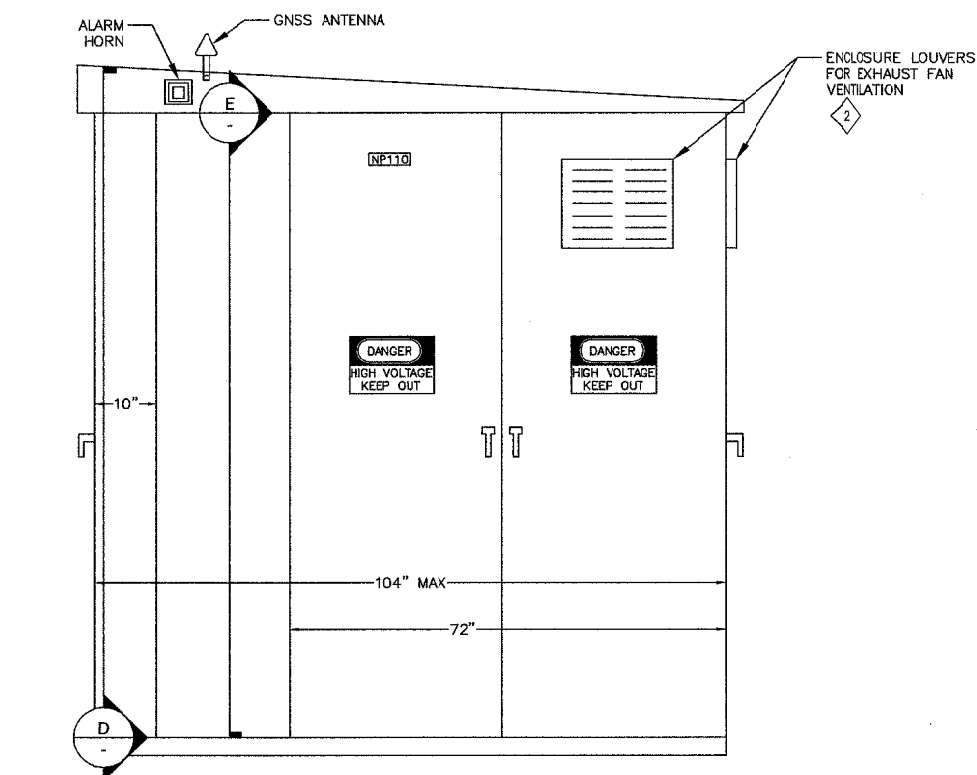
DRAWN V. LEONG
DESIGNED V. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
REG. ENGINEER NO. 43841
REG. ENGINEER NO. 42009
REG. ENGINEER NO. 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
CIRCUIT BREAKERS CONTROL SECTION LAYOUT

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
DATE: 11-07-2017
SCALE: AS SHOWN
SHEET: 12 OF 31 SHEETS
E12 AA-4221



DRAWING GENERAL NOTES

A. REFER TO SPECIFICATIONS FOR EQUIPMENT AND IDENTIFICATION REQUIREMENTS.

SHEET NOTES

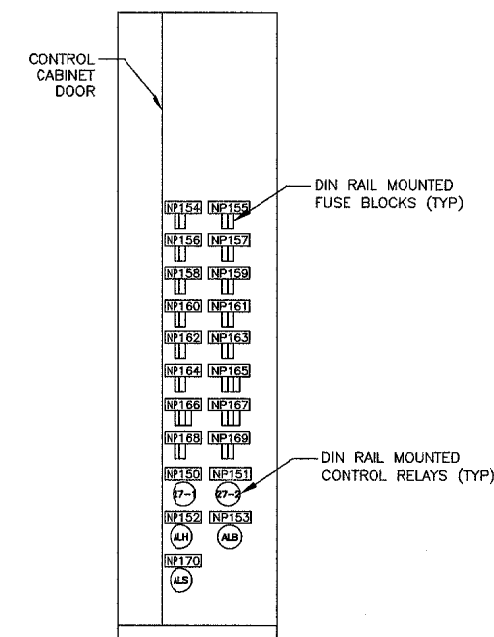
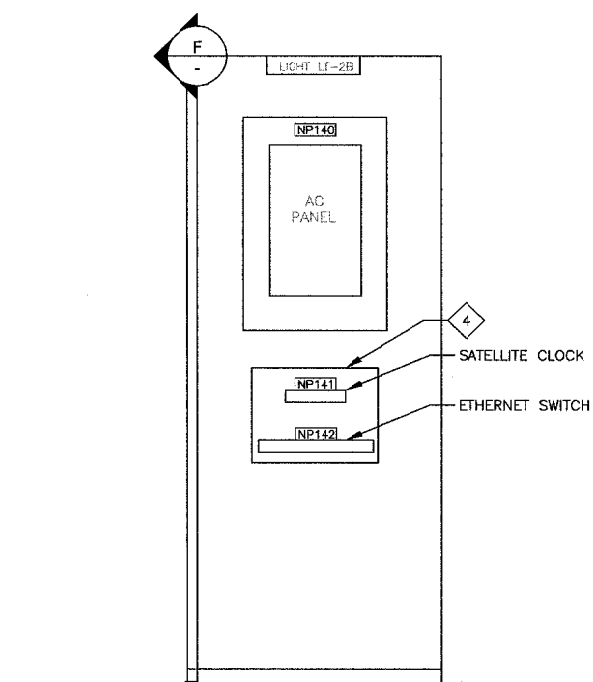
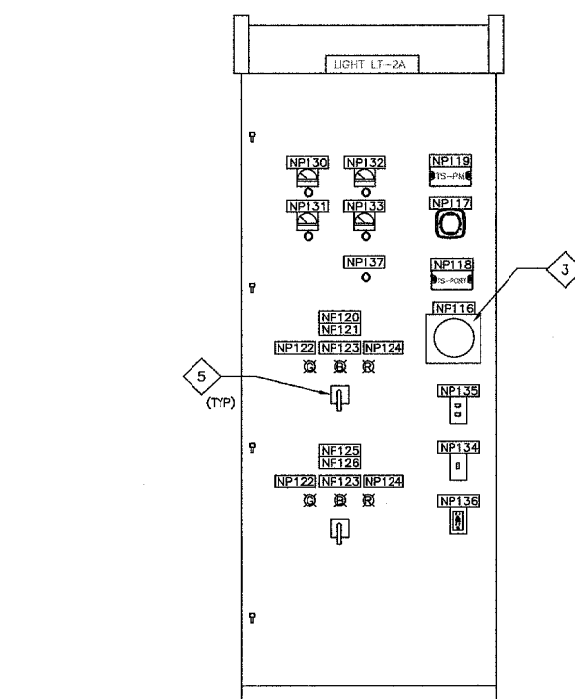
1 125VDC BATTERY BANK SHALL BE SIZED BY SWITCHGEAR MANUFACTURER.
PROVIDE SEISMIC BATTERY RACK AND BATTERY SPILL CONTAINMENT SYSTEM.
REFER TO SPECIFICATIONS FOR REQUIREMENTS.

2 SWITCHGEAR MANUFACTURER SHALL DESIGN AND SIZE BATTERY CABINET ENCLOSURE, EXHAUST FAN AND H2 GAS DETECTION MONITOR TO COMPLY WITH VENTILATION REQUIREMENTS OF IEEE 484 SUCH THAT THE BATTERY CABINET SECTION IS NOT CLASSIFIED AS A HAZARDOUS LOCATION. REFER TO E23 FOR CONTROL SCHEMATIC.

3 PROVIDE 13-JAW METER SOCKET AND REVENUE METER. ALL WIRE TERMINATIONS SHALL BE COVERED WITH DEADFRONT ASSEMBLY AND ALLOW THE INSERTION/REMOVAL OF METER WITHOUT DISASSEMBLY.

4 PROVIDE 5U MINIMUM EQUIPMENT RACK TO MOUNT DEVICES.

5 SWITCHGEAR MANUFACTURER SHALL COORDINATE POSITION OF BREAKER CONTROL SWITCHES TO ALLOW MOUNTING OF MARTEK CS-01 DEVICE WITHOUT ANY INTERFERENCE OR OBSTRUCTION OF INDICATING LIGHTS OR ANY OTHER COMPONENTS.



CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

17
REFERENCES:

[illegible]

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698 REG. ENGINEER NO.

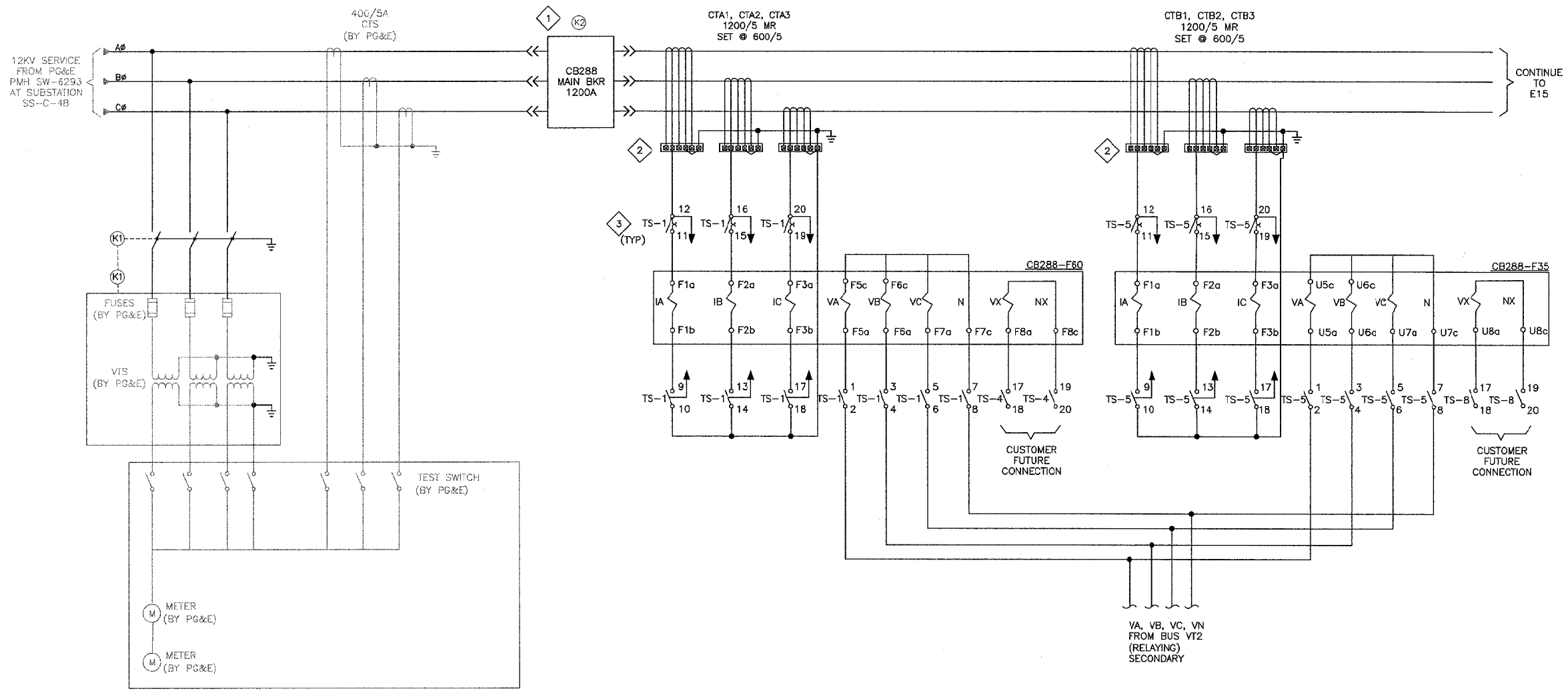
PORT OF OAKLAND
 530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
Chris Chan C 43841
Approved for Fuel REG. ENGINEER NO.
APPROVED C 42009
REG. ENGINEER NO.
RECOMMENDED *[Signature]* E 17400
REG. ENGINEER NO.

OUTER HARBOR		DATE: 11-07-2017	
SS-C-48 SWITCHGEAR REPLACEMENT		SCALE: AS SHOWN	
		SHEET: 13 OF 31 SHEETS	
CONTROL/BATTERY CABINET SECTION LAYOUT		E13	AA-4221



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DRAWING GENERAL NOTES

A. REFER TO EUSERC AND PG&E ELECTRIC & GAS SERVICE REQUIREMENTS FOR UTILITY METERING ENCLOSURE AND TERMINATION REQUIREMENTS.

SHEET NOTES

- MECHANICAL KEY INTERLOCK K2 BETWEEN CB288 AND CB322 BREAKER CELLS. THIS INTERLOCK SHALL ALLOW ONLY ONE CIRCUIT BREAKER TO BE RACKED IN AT ANY TIME.
- CT SHORTING TERMINAL BLOCKS SHALL BE INSTALLED IN SECTION 2A.
- REFER TO SPECIFICATIONS FOR TEST SWITCH REQUIREMENTS. TEST SWITCH NAMEPLATE SHALL BE PROVIDE IDENTIFICATION AND FUNCTIONAL DESCRIPTION. REFER TO E26 FOR DETAILS.

REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D., '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'C	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
THREE LINE DIAGRAM (1 OF 5)

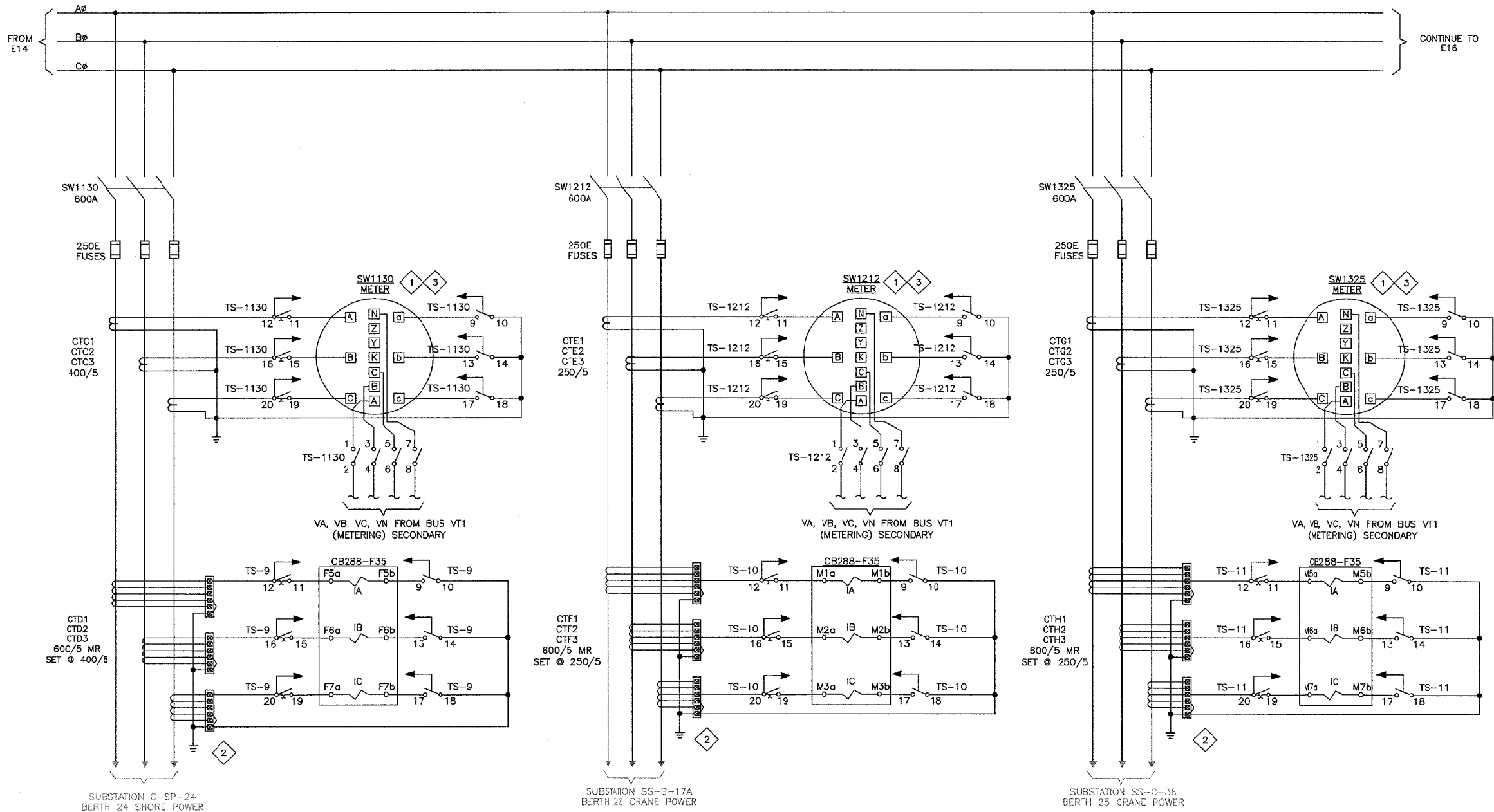
REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
DATE: 11-07-2017
SCALE: NONE
SHEET: 14 OF 31 SHEETS
E14 AA-4221

DRAWING GENERAL NOTES

- A. REFER TO SPECIFICATIONS FOR SWITCHGEAR REQUIREMENTS.
- B. EQUIPMENT DIMENSIONS ARE NOT SHOWN ON THIS DRAWING. REFER TO PLANS FOR DIMENSION REQUIREMENTS.
- C. REFER TO DWG E15 FOR NAMEPLATE AND LABEL IDENTIFICATION REQUIREMENTS.

SHEET NOTES

- 1 METER ENCLOSURE SHALL BE PROVIDED FOR EACH FUSED LOAD INTERRUPTER SWITCH SECTION. REFER TO E23.
- 2 CT SHORTING TERMINAL BLOCKS SHALL BE INSTALLED IN RESPECTIVE SWITCH SECTION TERMINAL JUNCTION BOX. REFER TO E29.
- 3 REFER TO METER WIRING DETAIL ON E30 FOR WIRING AND COLOR IDENTIFICATION REQUIREMENTS.



CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:
PLANS
FIELD BOOKS

"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29

CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
C 43841
REG. ENGINEER NO.
C 42009
APPROVED
E 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
THREE LINE DIAGRAM (2 OF 5)



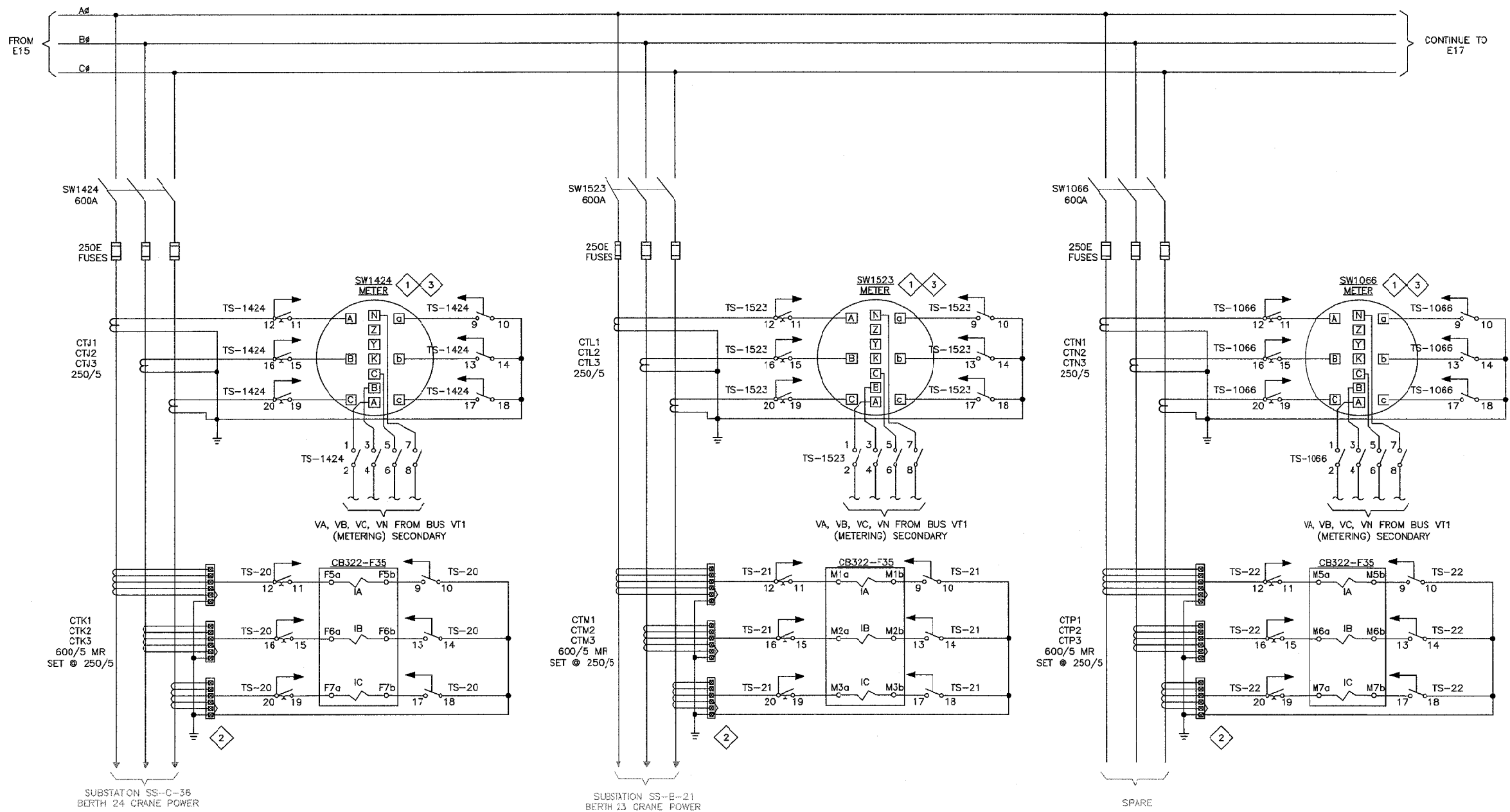
DATE: 11-07-2017
SCALE: NONE
SHEET 15 OF 31 SHEETS
E15 AA-4221

DRAWING GENERAL NOTES

- A. REFER TO SPECIFICATIONS FOR SWITCHGEAR REQUIREMENTS.
- B. EQUIPMENT DIMENSIONS ARE NOT SHOWN ON THIS DRAWING. REFER TO PLANS FOR DIMENSION REQUIREMENTS.
- C.

SHEET NOTES

- 1 METER ENCLOSURE SHALL BE PROVIDED FOR EACH FUSED LOAD INTERRUPTER SWITCH SECTION. REFER TO E25.
- 2 CT SHORTING TERMINAL BLOCKS SHALL BE INSTALLED IN RESPECTIVE SWITCH SECTION TERMINAL JUNCTION BOX. REFER TO E29.
- 3 REFER TO METER WIRING DETAIL ON E30 FOR WIRING AND COLOR IDENTIFICATION REQUIREMENTS.



CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29

CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APPD

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
RES. ENGINEER NO
CHECKED W. YEOMAN E 17698
RES. ENGINEER NO

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
C 43841
REG. ENGINEER NO.
C 42009
REG. ENGINEER NO.
E 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
THREE LINE DIAGRAM (3 OF 5)



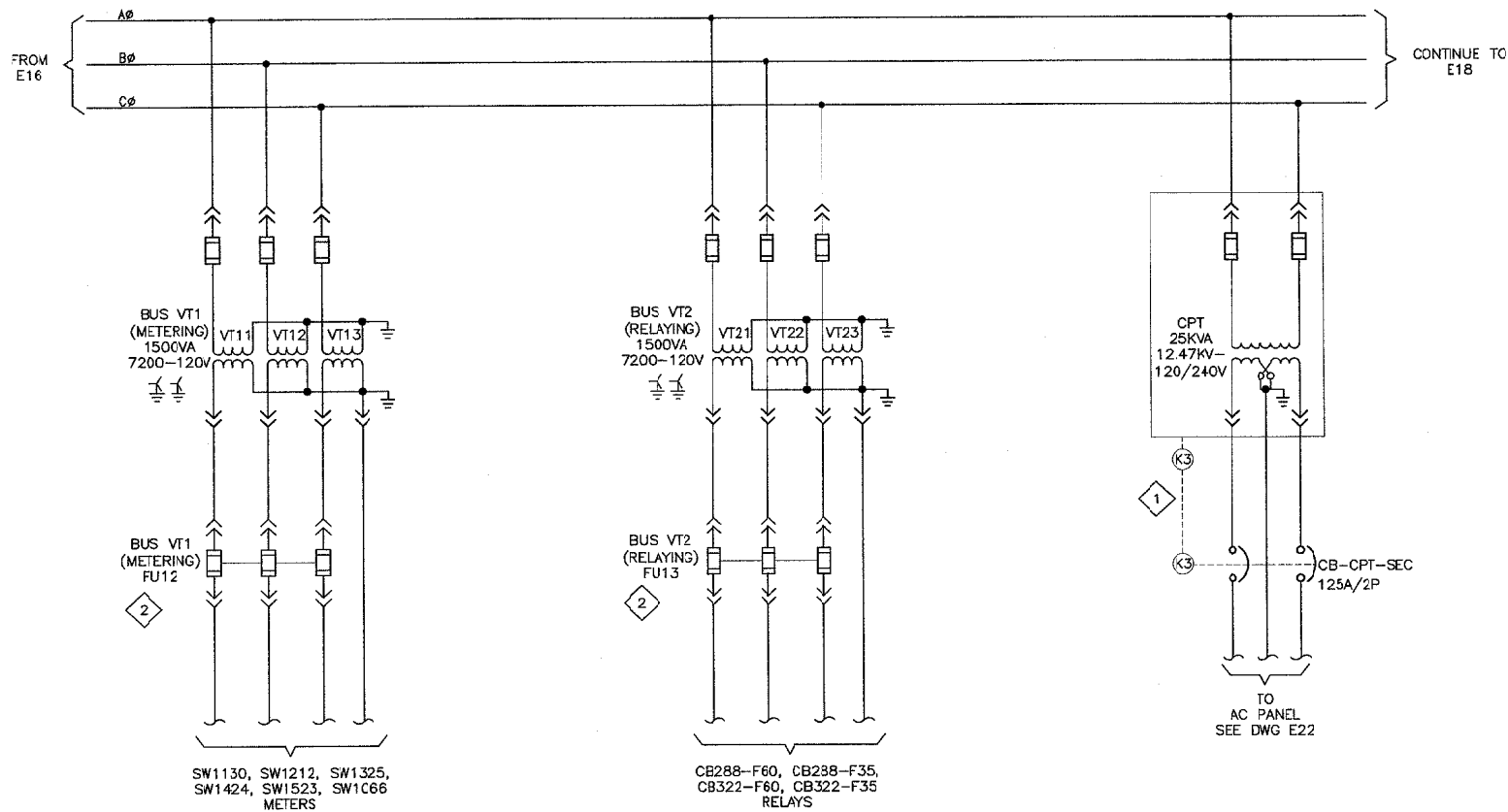
DATE: 11-07-2017
SCALE: NONE
SHEET: 16 OF 31 SHEETS
E16 AA-4221

DRAWING GENERAL NOTES

A. REFER TO SPECIFICATION FOR ADDITIONAL EQUIPMENT, RELAY AND DEVICE REQUIREMENTS.

SHEET NOTES

- 1 MECHANICAL KEY INTERLOCK K3 SHALL PREVENT WITHDRAWING OF CPT DRAWER WHILE SECONDARY CIRCUIT BREAKER CB-CPT-SEC IS CLOSED.
- 2 VT1 AND VT2 SECONDARY FUSES SHALL BE LOCATED IN SECTION 13 CONTROL COMPARTMENT.



CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17688
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
REG. ENGINEER NO. C 43841
REG. ENGINEER NO. C 42009
REG. ENGINEER NO. E 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
THREE LINE DIAGRAM (4 OF 5)

DATE: 11-07-2017
SCALE: NONE
SHEET: 17 OF 31 SHEETS
E17 AA-4221

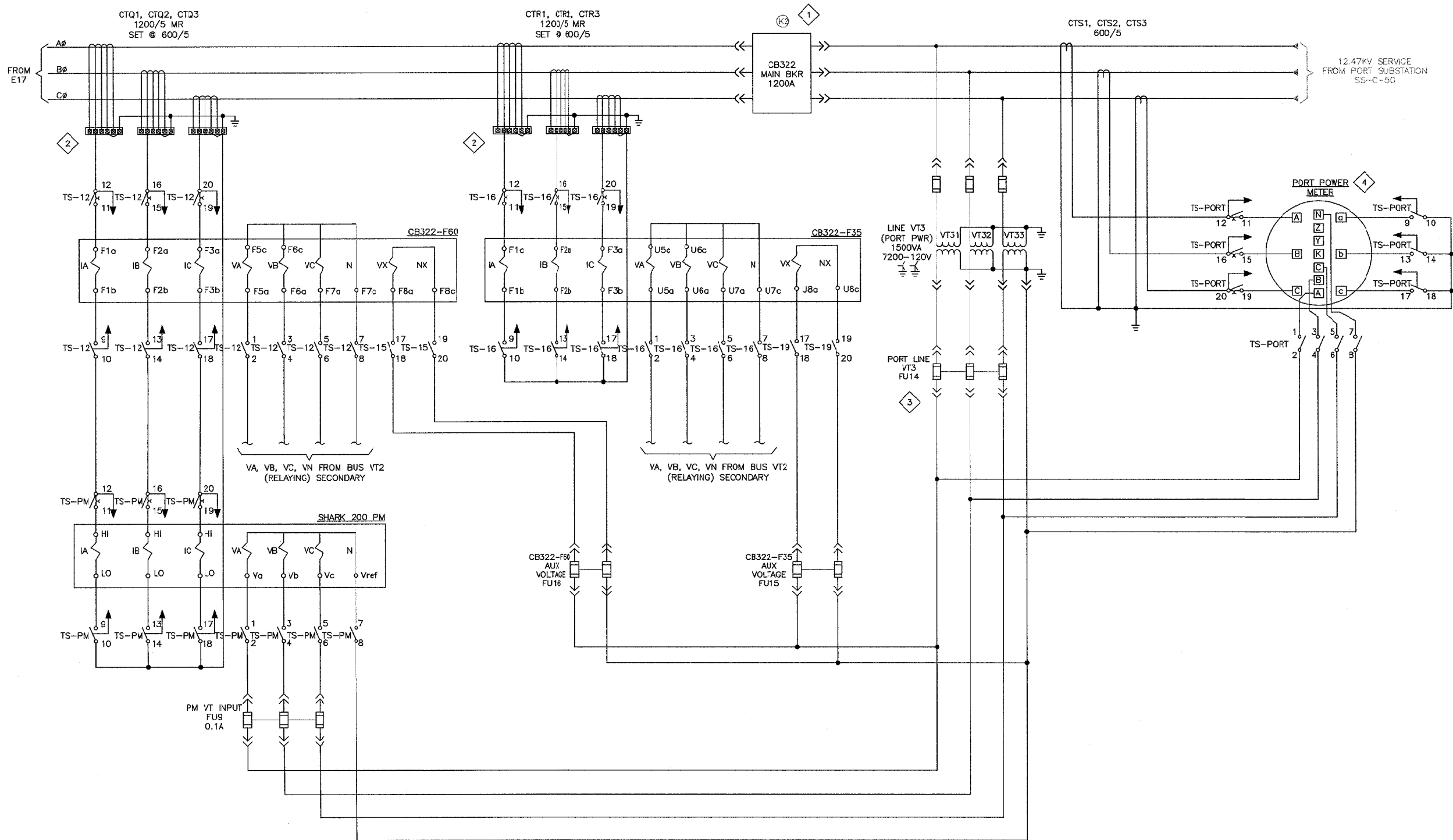


DRAWING GENERAL NOTES

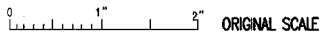
A. REFER TO SPECIFICATION FOR ADDITIONAL EQUIPMENT, RELAY AND DEVICE REQUIREMENTS.

SHEET NOTES

- 1 MECHANICAL KEY INTERLOCK K2 BETWEEN CB288 AND CB322 BREAKER CELLS. THIS INTERLOCK SHALL ALLOW ONLY ONE CIRCUIT BREAKER TO BE RACKED IN AT ANY TIME.
- 2 CT SHORTING TERMINAL BLOCKS SHALL BE INSTALLED IN SECTION 11A.
- 3 PORT LINE VT SECONDARY FUSES SHALL BE LOCATED IN SECTION 13 CONTROL COMPARTMENT.
- 4 REFER TO METER WIRING DETAIL ON E30 FOR WIRING AND COLOR IDENTIFICATION REQUIREMENTS.



CAUTION: THIS PLAN MAY BE REDUCED



REFERENCES:
PLANS
FIELD BOOKS
DATE: "PORT OF OAKLAND DATUM"
SHEET: 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV'D	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO. E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

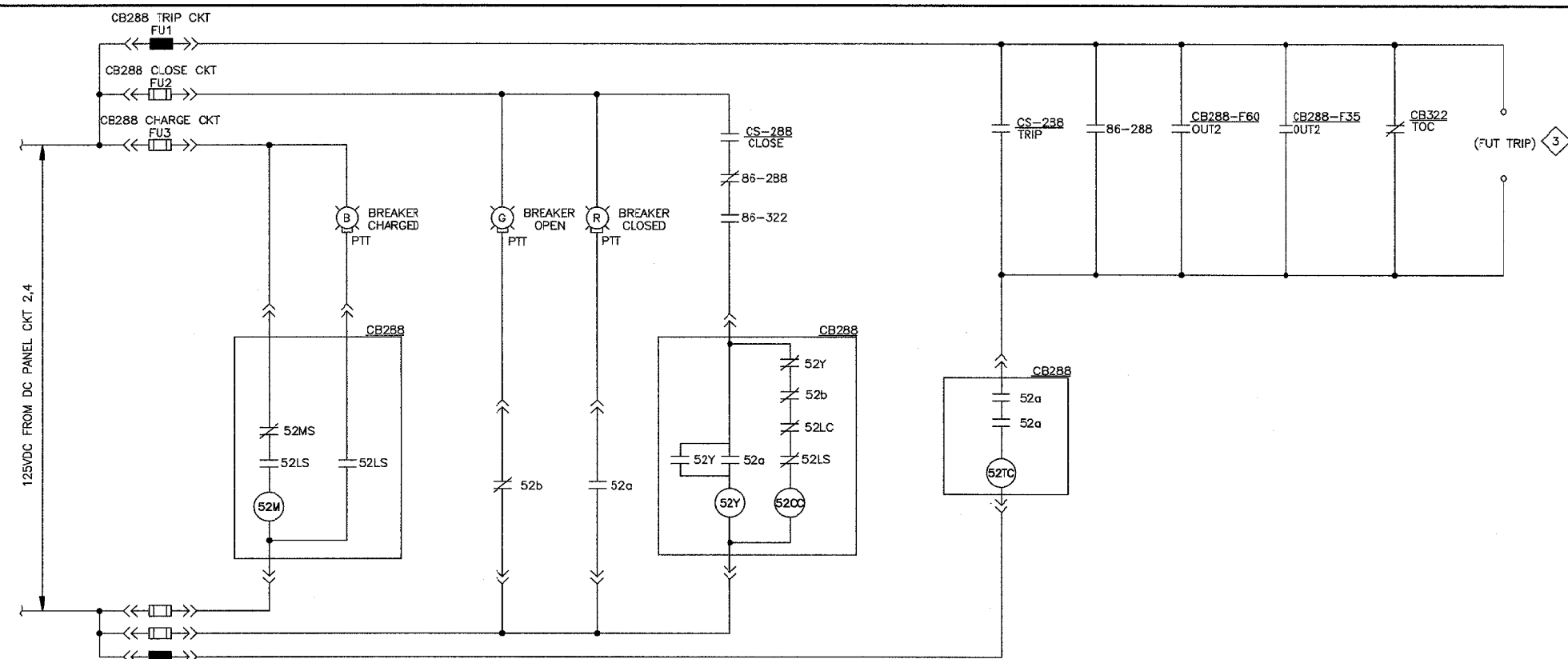
CHIEF ENGINEER
APPROVED
RECOMMENDED
C 43841
REG. ENGINEER NO. C 42009
E 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
THREE LINE DIAGRAM (5 OF 5)

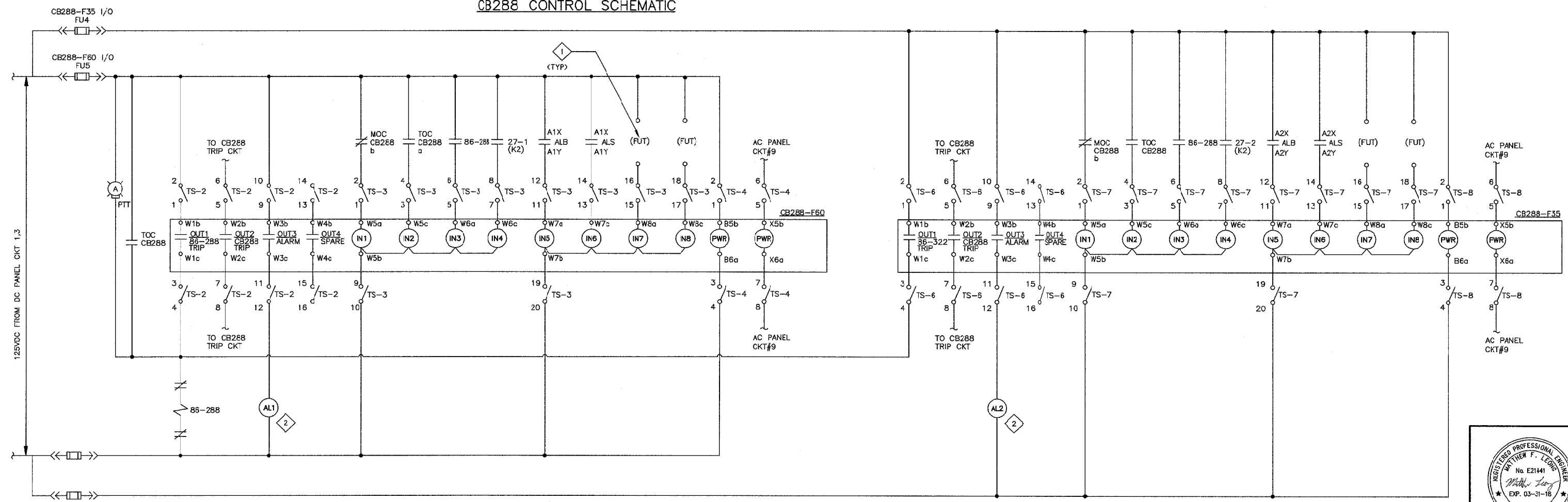
REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
STATE OF CALIFORNIA

DATE: 11-07-2017
SCALE: NONE
SHEET: 18 OF 31 SHEETS
E18 AA-4221

11-07-17 14:44:32 N:\PDDM2\Projects_2\B 20-36\ZZ24000027 - Birth 20-24 Electrical Rehabilitation\Design\VA-4221 SS-C-48 Switchgear Replacement.dwg Printed by mlong



CB288 CONTROL SCHEMATIC



CB288-F60/CB288-F35 SCHEMATIC

DRAWING GENERAL NOTES

A. REFER TO SPECIFICATION FOR ADDITIONAL EQUIPMENT, RELAY AND DEVICE REQUIREMENTS.

SHEET NOTES

- 1 ALL FUTURE INPUTS SHALL BE WIRED FROM TEST SWITCH TO TERMINAL BLOCK FOR FUTURE CONNECTION.
- 2 HEAVY DUTY INDUSTRIAL CONTROL RELAY ALLEN-BRADLEY 700S-PK OR APPROVED EQUAL REFER TO E21 FOR OUTPUT CONTACTS SCHEMATIC.
- 3 PROVISIONS FOR FUTURE TRIP CONTACT SHALL BE WIRED TO TERMINAL BLOCK FOR CUSTOMER FUTURE CONNECTION.

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:
PLANS
FIELD BOOKS
DATE "PORT OF OAKLAND DATUM"
DATE 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D
1				
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DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO. E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
C 43841
C 42009
E 17400
REG. ENGINEER NO. E 17400

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
CB288 CONTROL AND PROTECTION SCHEMATICS

DATE: 11-07-2017
SCALE: NONE
SHEET: 19 OF 31 SHEETS
E19 AA-4221

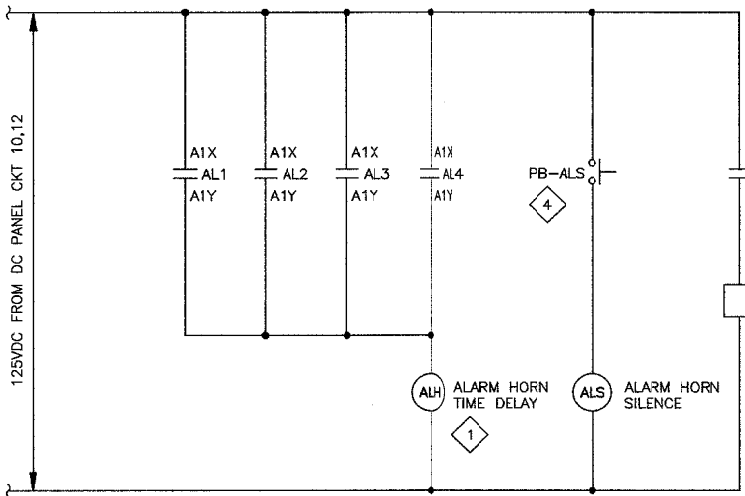


DRAWING GENERAL NOTES

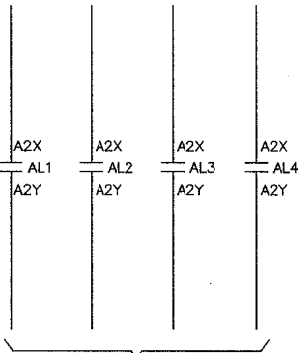
- A. REFER TO SPECIFICATION FOR ADDITIONAL EQUIPMENT, RELAY AND DEVICE REQUIREMENTS.
- B. OUTPUT CONTACT DESIGNATIONS ARE SHOWN FOR ALLEN BRADLEY 700S-PK FOR CLARITY.

SHEET NOTES

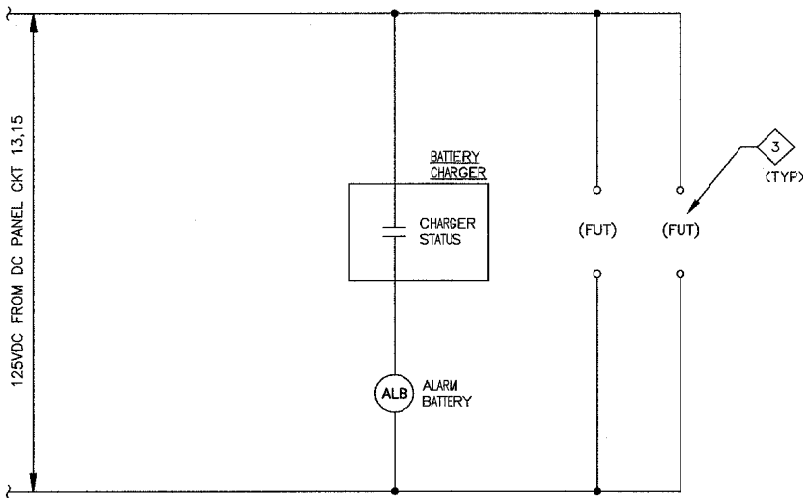
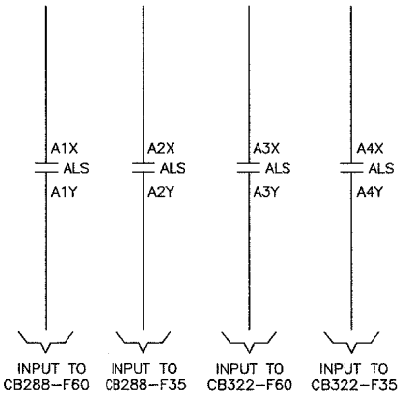
- 1 REPEAT CYCLE TIMER, ON-FIRST, 3-300 SEC. TIMING RANGE, MACROMATIC TR-55122-12 OR APPROVED EQUAL
- 2 FEDERAL SIGNAL 877-P1 OR APPROVED EQUAL
- 3 PROVISIONS FOR FUTURE 125VDC AUXILIARY CONTROL POWER SHALL BE WIRED TO TERMINAL BLOCK FOR CUSTOMER FUTURE CONNECTION.
- 4 ALARM HORN ACK/SILENCE MOMENTARY PUSHBUTTON. REFER TO E13 FOR INSTALLATION LOCATION. REFER TO SPECIFICATIONS FOR REQUIREMENTS.



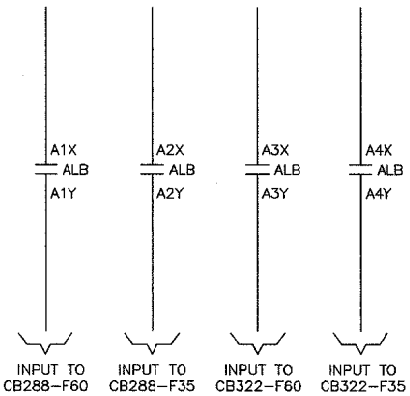
ALARM HORN SCHEMATIC



WIRE SPARE CONTACTS TO TERMINAL BLOCK IN SECTION 13 FOR CUSTOMER FUTURE CONNECTION



BATTERY CHARGER ALARM SCHEMATIC



CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
REG. ENGINEER NO. 43841
REG. ENGINEER NO. C 42009
REG. ENGINEER NO. E 17400
REG. ENGINEER NO.

OUTER HARBOR	DATE: 11-07-2017
SS-C-48 SWITCHGEAR REPLACEMENT	SCALE: NONE
ALARM CONTROL SCHEMATICS	SHEET: 21 OF 31 SHEETS
E21	AA-4221



[illegible]

LOCATION : SECTION 13 BATTERY CABINET				VOLTAGE/PHASE :				125VDC				FED FROM :				125VDC BATTERY			
MOUNTING : SURFACE MOUNTED IN SWITCHGEAR				BUS AMPS :				(NOTE 1)				MIN SHORT CKT. RATING :				(NOTE 1)			
LOADS		SEE NOTE	OUTLETS			VOLT-AMPS		CKT	BKR/POLE	EKR/POLE	CKT	VOLT-AMPS		OUTLETS		SEE NOTE	LOADS		
			MISC	REC	LTG	A	B					A	B	LTG	REC			MISC	
CB288-F60,-F35 PWR & I/O	1	1	20/2	20/2	2	1	CB288 BREAKER CONTROL		
—	1	3	—	—	4	1	—		
CB322-F60,-F35 PWR & I/O	1	5	20/2	15/2	6	1	CB322 BREAKER CONTROL		
—	1	7	—	—	8	1	—		
SATELLITE CLOCK, ETHERNET SW	1	9	20/2	20/2	10	1	ALARM CKT		
—	1	11	—	—	12	1	—		
AUX CONTROLS	1	13	20/2	20/2	14	1	SPARE		
—	1	15	—	—	16	1	—		
SPARE	1	17	20/2	20/2	18	1	SPARE		
—	1	19	—	—	20	1	—		
SPARE	21	20/2	20/2	22	1	SPARE		
—	23	—	—	24	1	—		

PANEL SHALL BE SIZED BY SWITCHGEAR MANUFACTURER

TOTAL A = — VOLT-AMP

TOTAL B = — VOLT-AMP

LCL = — VOLT-AMP

NOTES:

1. SHALL BE SIZED BY SWITCH-GEAR MANUFACTURER.

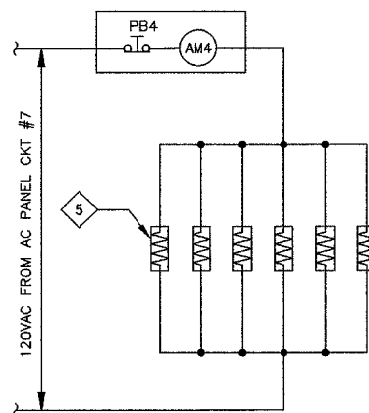
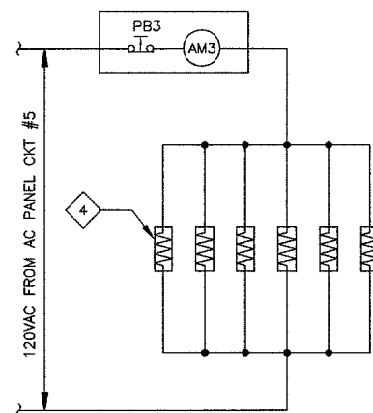
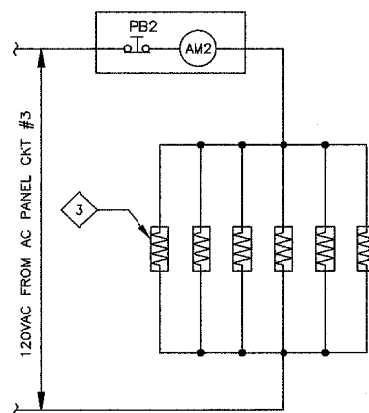
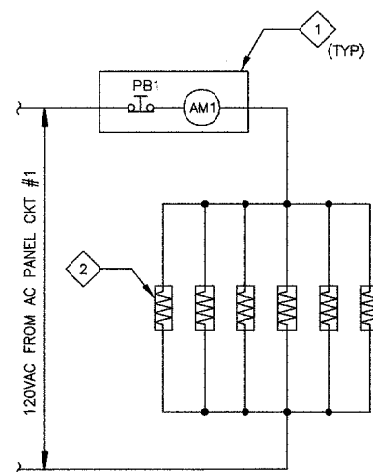
11-07	PLANS
	FIELD BOOKS
DATE	"PORT OF OAKLAND DATUM" IS 3.20' BELOW N.G.V.D. '29
PRINT	CAUTION: CHECK TRACING FOR LATEST REVISIONS

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698 REG. ENGINEER NO.

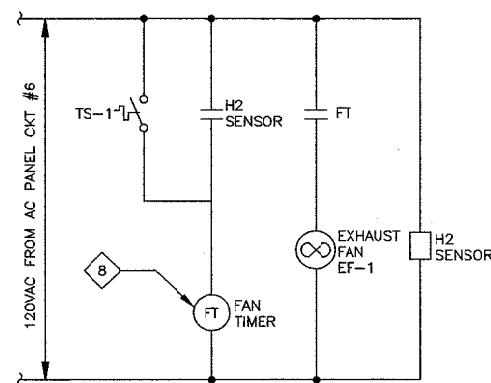
CHIEF ENGINEER	
<i>Chris Chan</i>	C 43841
<i>Scott S. Imeo</i>	REG. ENGINEER NO.
APPROVED	C 42009
	REG. ENGINEER NO.
RECOMMENDED <i>Asht</i>	E 17400
	REG. ENGINEER NO.

OUTER HARBOR
 SS-C-48 SWITCHGEAR REPLACEMENT
 AC AND DC PANEL SCHEDULES

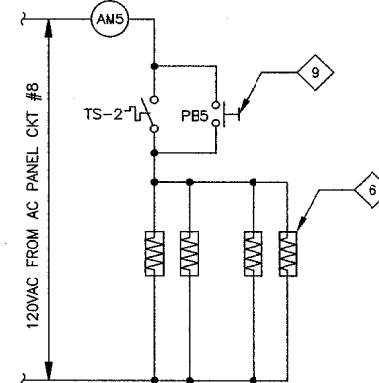
DATE: 11-07-2017
SCALE: NONE
SHEET: 22 OF 31 SHEETS
E22 AA-4221



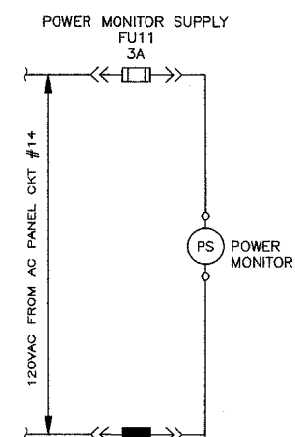
SPACE HEATER CONTROL SCHEMATIC



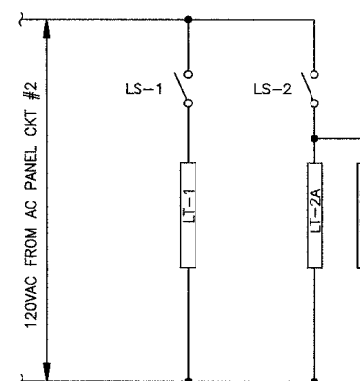
SECTION 13 BATTERY CABINET EXHAUST FAN SCHEMATIC



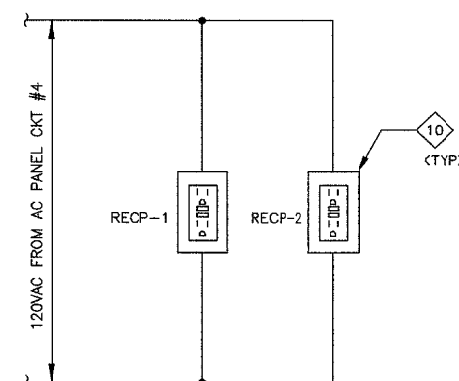
SECTION 13 BATTERY CABINET SPACE HEATER CONTROL SCHEMATIC



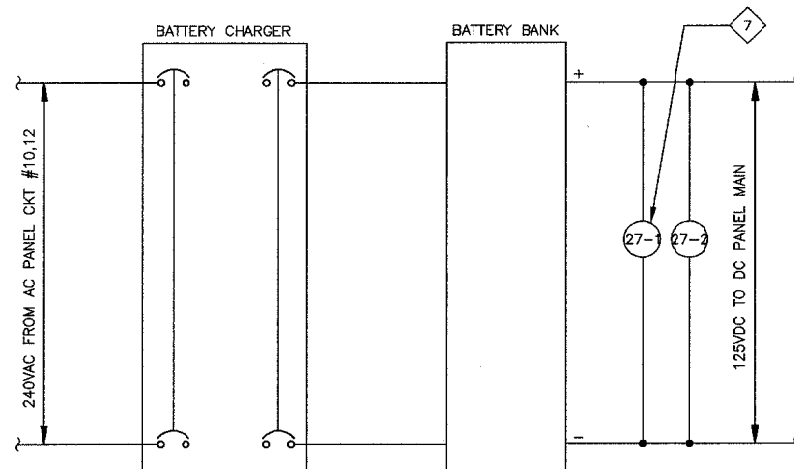
POWER MONITOR SCHEMATIC



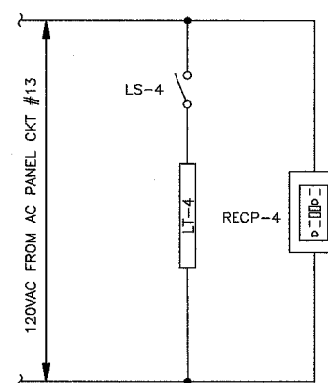
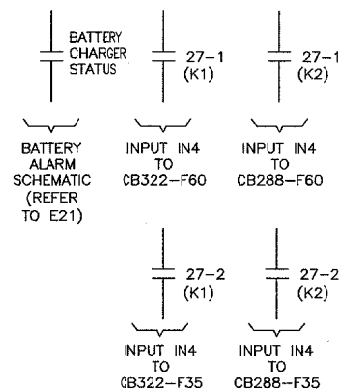
SECTION 13 CONTROL/BATTERY
CABINET LIGHTING SCHEMATIC



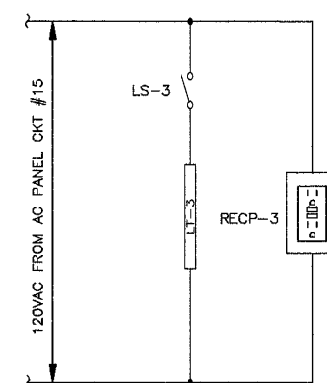
SECTION 13 CONTROL/BATTERY CABINET RECEPTACLE SCHEMATIC



BATTERY CHARGER SCHEMATIC



SECTION 2 LIGHTING/RECEPTACLE SCHEMATIC



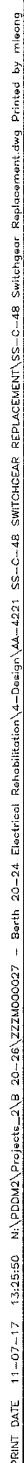
SECTION 11 LIGHTING/RECEPTACLE SCHEMATIC

DRAWING GENERAL NOTES

A. REFER TO SPECIFICATIONS FOR EQUIPMENT AND FUNCTIONAL REQUIREMENTS.

SHEET NOTES

- 1 SPACE HEATER SUPPLY CIRCUITS SHALL BE WIRED TO MOMENTARY PUSHBUTTON NORMALLY CLOSED CONTACT. AMMETER WILL INDICATE SUM OF HEATERS LOAD CURRENT. WHEN PUSHBUTTON IS PRESSED, AMMETER WILL READ ZERO AMPERES.
- 2 SPACE HEATERS FOR SECTIONS 1,2,3. QUANTITY AND RATING SHALL BE SIZED BY MANUFACTURER. REFER TO SPECIFICATIONS.
- 3 SPACE HEATERS FOR SECTIONS 4,5,6. QUANTITY AND RATING SHALL BE SIZED BY MANUFACTURER. REFER TO SPECIFICATIONS.
- 4 SPACE HEATERS FOR SECTIONS 7,8,9. QUANTITY AND RATING SHALL BE SIZED BY MANUFACTURER. REFER TO SPECIFICATIONS.
- 5 SPACE HEATERS FOR SECTIONS 10,11,12. QUANTITY AND RATING SHALL BE SIZED BY MANUFACTURER. REFER TO SPECIFICATIONS.
- 6 SPACE HEATERS FOR BATTERY CABINET AND CONTROL COMPARTMENT (SECTION 13).
- 7 UNDERVOLTAGE RELAY MONITOR, BENDER VME421H-D-1 OR APPROVED EQUAL.
- 8 INTERVAL ON TIMER, RANGE 0.3-30 MINUTES, MACROMATIC TR-50522-15 OR APPROVED EQUAL.
- 9 MOMENTARY PUSHBUTTON NORMALLY OPEN CONTACT SHALL BE WIRED IN PARALLEL WITH THERMOSTAT CONTACT TO SERVE AS BYPASS FOR SPACE HEATER AMMETER INDICATION.
- 10 DUPLEX GFCI RECEPTACLE.



17 REFERENCES:

DATE 11-07 PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29

CAUTION:
CHECK TRACING FOR LATEST REVISIONS

[illegible]

DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698 REG. ENGINEER NO.

PORT OF OAKLAND
 530 WATER ST. OAKLAND, CALIFORNIA

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

CHIEF ENGINEER

Chris Chan C 43841

Substituted for Immy REG. ENGINEER NO.

APPROVED *C* C 42009

REG. ENGINEER NO.

RECOMMENDED *C* E 17400

REG. ENGINEER NO.

OUTER HARBOR

SS-C-48 SWITCHGEAR REPLACEMENT

AC CONTROL POWER SCHEMATICS

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
Matthew Leong
EXP. 03-31-18
STATE OF CALIFORNIA

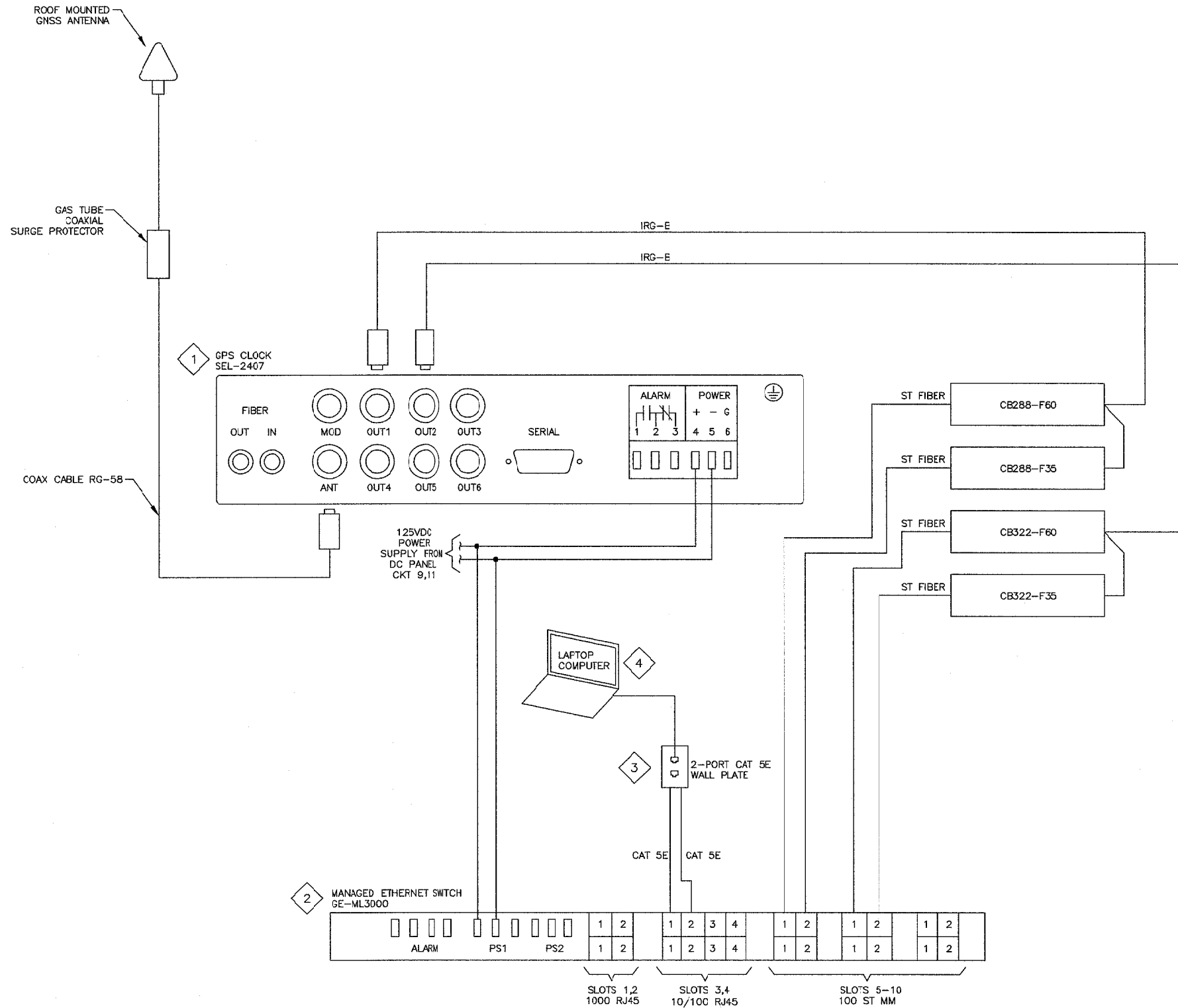
DATE: 11-07-2017

SCALE: NONE

SHEET: 23 OF 31 SHEETS

E23	AA-422
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11-07-17 13:05:54 N:\PDDM\Projects_3\B 20-26\ZZZM000027 - Berth 20-24 Electrical Rehabilitation\1-Design\AA-4221 SS-C-48 SWITCHGEAR REPLACEMENT.dwg Printed by: mlong



DRAWING GENERAL NOTES

A. REFER TO SPECIFICATION FOR ADDITIONAL EQUIPMENT AND DEVICE REQUIREMENTS.

SHEET NOTES

- 1 GPS CLOCK SHALL BE RACK MOUNTED WITH DISPLAY FACING FRONT. REFER TO DETAIL E ON E13 FOR LOCATION AND LAYOUT.
- 2 ETHERNET SWITCH SHALL BE RACK MOUNTED WITH DISPLAY FACING FRONT. REFER TO DETAIL E ON E13 FOR LOCATION AND LAYOUT.
- 3 2-PORT CAT 5E WALL PLATE SHALL BE FLUSH MOUNTED FOR FRONT ACCESS. REFER TO DETAIL D ON E13 FOR LOCATION AND LAYOUT.
- 4 PROVIDE LAPTOP COMPUTER. REFER TO SPECIFICATIONS FOR REQUIREMENTS.

REFERENCES:				
PLANS				
FIELD BOOKS				
"PORT OF OAKLAND DATUM" IS 3.20' BELOW N.G.V.D. '29				
CAUTION: CHECK TRACING FOR LATEST REVISIONS				

NO.	REVISIONS	DATE	REV	APP'D

DRAWN	M. LEONG
DESIGNED	M. LEONG E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN E 17698 REG. ENGINEER NO.

CAUTION: THIS PLAN MAY BE REDUCED

PORT OF OAKLAND

530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER	Chris Cho E 43841 REG. ENGINEER NO.
APPROVED	Scott for Imel E 42009 REG. ENGINEER NO.
RECOMMENDED	E 17400 REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
NETWORK DIAGRAM

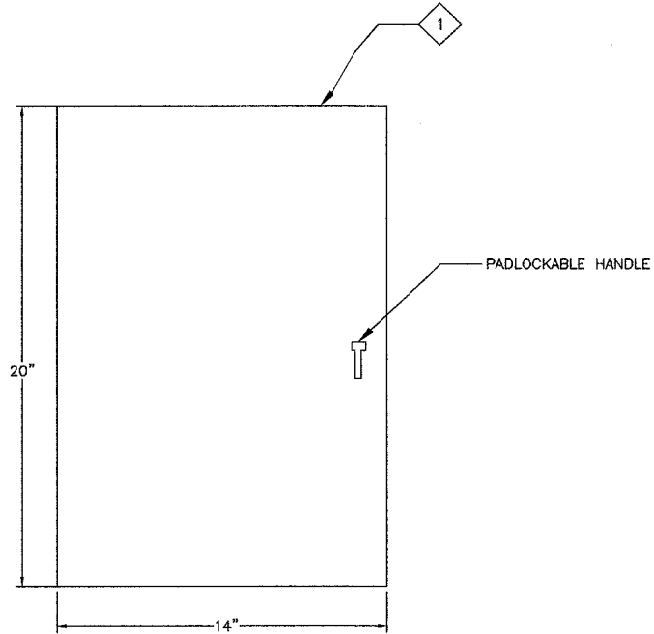
REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
STATE OF CALIFORNIA

DATE: 11-07-2017
SCALE: NONE
SHEET: 24 OF 31 SHEETS
E24 AA-4221

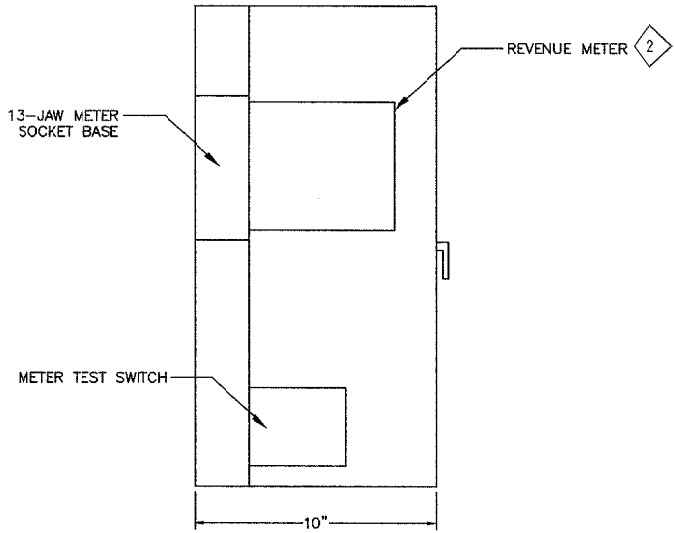
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SHEET NOTES

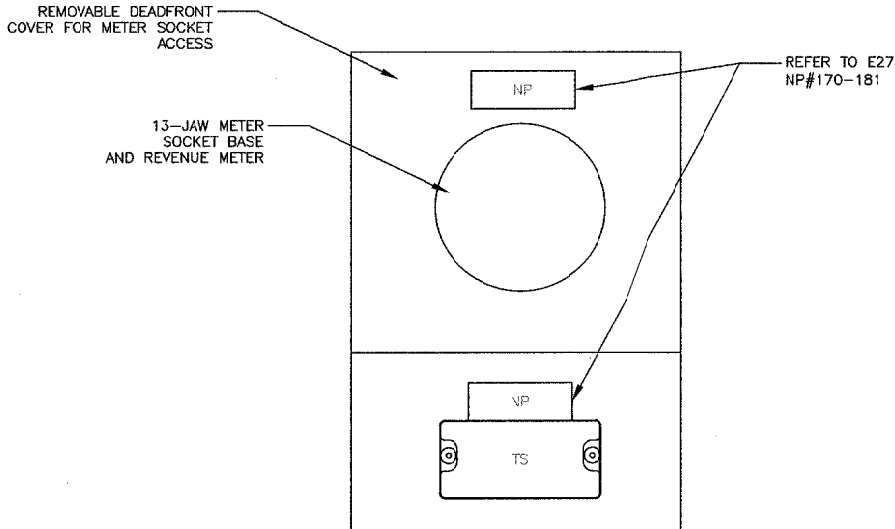
- 1 NEMA 3R METER SOCKET ENCLOSURE SHALL BE WELDED AND SECURED TO FRONT EXTERIOR ENCLOSURE DOORS OF LOAD INTERRUPTER SWITCHGEAR SECTIONS AS SHOWN ON PLANS. ENCLOSURE SHALL BE WEATHERPROOFED AND MATCH PAINT OF SWITCHGEAR LINEUP.
- 2 ITRON CENTRON REVENUE METER. REFER TO SPECIFICATIONS FOR REQUIREMENTS.



METER SOCKET ENCLOSURE FRONT VIEW
SCALE: 3"=1'-0"



METER SOCKET ENCLOSURE SECTION VIEW
SCALE: 3"=1'-0"



METER SOCKET ENCLOSURE
(SHOWN WITH FRONT DOOR REMOVED)
SCALE: 3"=1'-0"

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D. '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED
REG. ENGINEER NO. 43841
REG. ENGINEER NO. 42009
REG. ENGINEER NO. 17400
REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
METER ENCLOSURE DETAILS

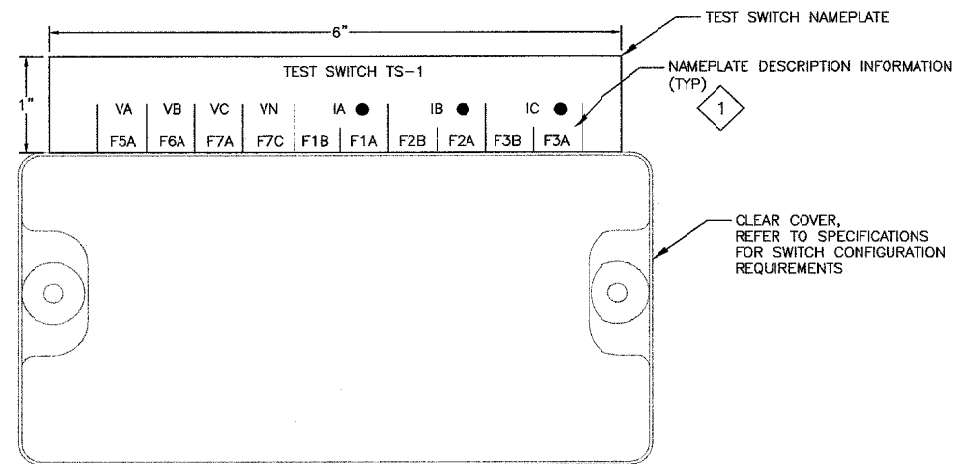
REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
DATE: 11-07-2017
SCALE: NONE
SHEET: 25 OF 31 SHEETS
E25 AA-4221

11-07-17 13:26:03 N:\PDDM2\Projects\3\B 20-26\ZZZMPO0027 - Berth 20-24 Electrical Rehabilitation\1-Design\AA-4221 SS-C-48 Switchgear Replacement.dwg Printed by mlsong

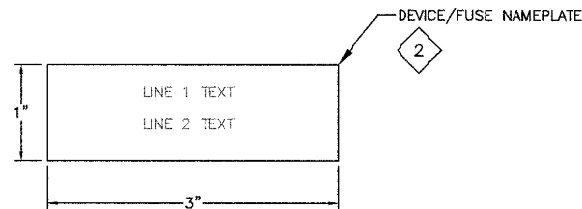
SHEET NOTES

1 THE TEST SWITCH NAMEPLATE INFORMATION SHOWN SHALL BE USED AS AN EXAMPLE ONLY. SWITCHGEAR MANUFACTURER SHALL SUBMIT TEST SWITCH NAMEPLATE IDENTIFICATION SCHEDULE FOR APPROVAL. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS.

2 REFER TO NAMEPLATE IDENTIFICATION SCHEDULE ON E27.



TEST SWITCH NAMEPLATE AND IDENTIFICATION



DEVICE/FUSE NAMEPLATE AND IDENTIFICATION

REFERENCES:
PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
IS 3.20' BELOW N.G.V.D., '29
CAUTION:
CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D

DRAWN M. LEONG
DESIGNED M. LEONG E 21441
REG. ENGINEER NO.
CHECKED W. YEOMAN E 17698
REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CAUTION: THIS PLAN MAY BE REDUCED
0 1 2 ORIGINAL SCALE
CHIEF ENGINEER
APPROVED
RECOMMENDED

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
NAMEPLATE IDENTIFICATION DETAILS

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
DATE: 11-07-2017
SCALE: NONE
SHEET: 26 OF 31 SHEETS
E26 AA-4221

1325506 11-07-17 20-24 Electrical Rehabilitation\A=Design\A=221 SS-C-48 Switchgear Replacement.dwg Printed by mison

DRAWING GENERAL NOTES

- A. REFER TO SPECIFICATIONS FOR IDENTIFICATION REQUIREMENTS.
- B. ALL PHENOLIC NAMEPLATES SHALL BE WHITE BACKGROUND WITH BLACK CORE.

SHEET NOTES

1. REFER TO E26 AND SPECIFICATIONS FOR ADDITIONAL DETAILS. SWITCHGEAR MANUFACTURER SHALL SUBMIT TEST SWITCH NAMEPLATE IDENTIFICATION SCHEDULE FOR APPROVAL PRIOR TO FABRICATION.

NAMEPLATE SCHEDULE					
NP#	LINE 1 TEXT	LINE 2 TEXT	QTY	NP SIZE	TEXT SIZE
1	PG&E	METERING & TERMINATION	1	1"X3"	1/4"
2	CB288		1	2"X6"	3/2"
3	TRANSITION	SECTION	4	1"X3"	1/4"
4	SW1130		1	2"X6"	3/2"
5	SW1212		1	2"X6"	3/2"
6	SW1325		1	2"X6"	3/2"
7	SW1424		1	2"X6"	3/2"
8	SW1523		1	2"X6"	3/2"
9	SW1066		1	2"X6"	3/2"
10	CB322		1	2"X6"	3/2"
11	PORT	TERMINATION SECTION	1	1"X3"	1/4"
12	CONTROL	CABINET	1	1"X3"	1/4"
13	(REAR) PG&E	METERING & TERMINATION	1	1"X3"	1/4"
14	(REAR)	CB288	1	1"X3"	1/4"
15	(REAR)	SW1130	1	1"X3"	1/4"
16	(REAR)	SW1212	1	1"X3"	1/4"
17	(REAR)	SW1325	1	1"X3"	1/4"
18	(REAR)	SW1424	1	1"X3"	1/4"
19	(REAR)	SW1523	1	1"X3"	1/4"
20	(REAR)	SW1066	1	1"X3"	1/4"
21	(REAR)	CB322	1	1"X3"	1/4"
22	(REAR) PORT	TERMINATION SECTION	1	1"X3"	1/4"
23	(REAR)	BATTERY CABINET	1	1"X3"	1/4"
24	PG&E	12KV SERVICE	2	1"X3"	1/4"
25	FUSES	250E	6	1"X3"	1/4"
26	12.47KV		1	1"X3"	1/4"
30	PG&E	METERING SECTION	1	1"X3"	1/4"
31	PG&E	VT COMPARTMENT	1	1"X3"	1/4"
32	PG&E	VT FUSES	1	1"X3"	1/4"
33	CB288	CONTROLS	1	1"X3"	1/4"
34	CB288		1	1"X3"	1/2"
35	CB322	CONTROLS	1	1"X3"	1/4"
36	CB322		1	1"X3"	1/2"
37	BUS VT1 (METERING)	VOLTAGE XFMR	1	1"X3"	1/4"
38	BUS VT2 (RELAYING)	VOLTAGE XFMR	1	1"X3"	1/4"
39	CPT	15KVA, 120/240V	1	1"X3"	1/4"
40	LINE VT3 (PORT POWER)	VOLTAGE XFMR	1	1"X3"	1/4"
41	CONTROL	CABINET	1	1"X3"	1/4"
50	SECTION 1		1	1"X3"	1/2"
51	SECTION 2A		1	1"X3"	1/2"
52	SECTION 2B		1	1"X3"	1/2"
53	SECTION 11A		1	1"X3"	1/2"
54	SECTION 11B		1	1"X3"	1/2"
55	SECTION 12A		1	1"X3"	1/2"
56	SECTION 12B		1	1"X3"	1/2"
57	SECTION 12C		1	1"X3"	1/2"
58	SECTION 12D		1	1"X3"	1/2"
59	SECTION 13		1	1"X3"	1/2"
70	CB288-F35	RELAY	1	1"X3"	1/4"
71	TEST SWITCH TS-5	(NOTE 1)	1	1"X6"	1/4"
72	TEST SWITCH TS-6	(NOTE 1)	1	1"X6"	1/4"
73	TEST SWITCH TS-7	(NOTE 1)	1	1"X6"	1/4"
74	TEST SWITCH TS-8	(NOTE 1)	1	1"X6"	1/4"
75	TEST SWITCH TS-9	(NOTE 1)	1	1"X6"	1/4"
76	TEST SWITCH TS-10	(NOTE 1)	1	1"X6"	1/4"
77	TEST SWITCH TS-11	(NOTE 1)	1	1"X6"	1/4"
78	LIGHT SWITCH	LS-4	1	1"X3"	1/4"
80	CB288-F60		1	1"X3"	1/2"
81	LOCKOUT RELAY	86-288	1	1"X3"	1/4"
82	TEST SWITCH TS-1	(NOTE 1)	1	1"X6"	1/4"
83	TEST SWITCH TS-2	(NOTE 1)	1	1"X6"	1/4"
84	TEST SWITCH TS-3	(NOTE 1)	1	1"X6"	1/4"
85	TEST SWITCH TS-4	(NOTE 1)	1	1"X6"	1/4"
86	RECEPTACLE	RECP-4	1	1"X3"	1/4"

NAMEPLATE SCHEDULE (CONTINUED)					
NP#	LINE 1 TEXT	LINE 2 TEXT	QTY	NP SIZE	TEXT SIZE
90	CB322-F35		1	1"X3"	1/2"
91	TEST SWITCH TS-16	(NOTE 1)	1	1"X6"	1/4"
92	TEST SWITCH TS-17	(NOTE 1)	1	1"X6"	1/4"
93	TEST SWITCH TS-18	(NOTE 1)	1	1"X6"	1/4"
94	TEST SWITCH TS-19	(NOTE 1)	1	1"X6"	1/4"
95	TEST SWITCH TS-20	(NOTE 1)	1	1"X6"	1/4"
96	TEST SWITCH TS-21	(NOTE 1)	1	1"X6"	1/4"
97	TEST SWITCH TS-22	(NOTE 1)	1	1"X6"	1/4"
98	LIGHT SWITCH	LS-3	1	1"X3"	1/4"
100	CB322-F60		1	1"X3"	1/2"
101	LOCKOUT RELAY	86-312	1	1"X3"	1/4"
102	TEST SWITCH TS-12	(NOTE 1)	1	1"X6"	1/4"
103	TEST SWITCH TS-13	(NOTE 1)	1	1"X6"	1/4"
104	TEST SWITCH TS-14	(NOTE 1)	1	1"X6"	1/4"
105	TEST SWITCH TS-15	(NOTE 1)	1	1"X6"	1/4"
106	RECEPTACLE	RECP-3	1	1"X3"	1/4"
110	BATTERY/	CABINET	1	1"X3"	1/4"
111	DC PANEL	125VDC	1	1"X3"	1/4"
112	GA5 DETECTOR		1	1"X3"	1/4"
113	BATTERY	CHARGER	1	1"X3"	1/4"
114	LIGHT SWITCH	LS-1	1	1"X3"	1/4"
115	RECEPTACLE	RECP-1	1	1"X3"	1/4"
116	PORT POWER	METER	1	1"X3"	1/4"
117	POWER MONITOR	(PORT POWER)	1	1"X3"	1/4"
118	TEST SWITCH TS-PORT	(NOTE 1)	1	1"X6"	1/4"
119	TEST SWITCH TS-PM	(NOTE 1)	1	1"X3"	1/4"
120	CB322 CONTROLS	CS-322	1	1"X3"	1/4"
121	12.47KV PORT POWER		1	1"X3"	1/2"
122	BREAKER OPEN		2	1"X3"	1/2"
123	BREKER CHARGED		2	1"X3"	1/2"
124	BREAKER CLOSED		2	1"X3"	1/2"
125	CB288 CONTROLS	CS-238	1	1"X3"	1/4"
126	12KV PG&E POWER		1	1"X3"	1/2"
130	SPACE HEATER MONITOR	SECTIONS 1,2,3	1	1"X3"	1/4"
131	SPACE HEATER MONITOR	SECTIONS 4,5,6	1	1"X3"	1/4"
132	SPACE HEATER MONITOR	SECTIONS 7,8,9	1	1"X3"	1/4"
133	SPACE HEATER MONITOR	SECTIONS 10,11,12,13	1	1"X3"	1/4"
134	LIGHT SWITCH	LS-2	1	1"X3"	1/4"
135	2 PORT	CATSE	1	1"X3"	1/4"
136	RECEPTACLE	RECP-2	1	1"X3"	1/4"
137	ALARM HORN	ACK/SILENCE	1	1"X3"	1/4"
140	AC PANEL	120/240VAC	1	1"X3"	1/4"
141	SATELLITE	CLOCK	1	1"X3"	1/4"
142	ETHERNET	SWITCH	1	1"X3"	1/4"
147	THERMOSTAT TS-1	EXHAUST FAN	1	1"X3"	1/4"
148	THERMOSTAT TS-2	SPACE HEATERS	1	1"X3"	1/4"
149	SPACE HEATER MONITOR	BATTERY CABINET	1	1"X3"	1/4"
150	DC UV RELAY	27-1	1	1"X3"	1/4"
151	DC UV RELAY	27-2	1	1"X3"	1/4"
152	ALARM HORN	TIME DELAY, ALH	1	1"X3"	1/4"
153	ALARM	BATTERY	1	1"X3"	1/4"
154	FU1, 125VDC	CB288 TRIP CKT	1	1"X3"	1/4"
155	FU2, 125VDC	CB288 CLOSE CKT	1	1"X3"	1/4"
156	FU3, 125VDC	CB288 CHARGE CKT	1	1"X3"	1/4"
157	FU4, 125VDC	CB288-F35 I/O	1	1"X3"	1/4"
158	FU5, 125VDC	CB288-F50 I/O	1	1"X3"	1/4"
159	FU6, 125VDC	CB322 TRIP CKT	1	1"X3"	1/4"
160	FU7, 125VDC	CB322 CLOSE CKT	1	1"X3"	1/4"
161	FU8, 125VDC	CB322 CHARGE CKT	1	1"X3"	1/4"
162	FU9, 125VDC	CB322-F35 I/O	1	1"X3"	1/4"
163	FU10, 125VDC	CB322-F50 I/O	1	1"X3"	1/4"
164	FU11, 120VAC	POWER MONITOR SUPPLY	1	1"X3"	1/4"
165	FU12, 120VAC	BUS VT1 (METERING)	1	1"X3"	1/4"
166	FU13, 120VAC	BUS VT2 (RELAYING)	1	1"X3"	1/4"
167	FU14, 120VAC	LINE VT3 (PORT POWER)	1	1"X3"	1/4"
168	FU15, 120VAC	CB322-F35 AUX VOLTAGE	1	1"X3"	1/4"
169	FU16, 120VAC	CB322-F60 AUX VOLTAGE	1	1"X3"	1/4"
170	ALARM HORN	SILENCE, ALS	1	1"X3"	1/4"

NAMEPLATE SCHEDULE (CONTINUED)					
NP#	LINE 1 TEXT	LINE 2 TEXT	QTY	NP SIZE	TEXT SIZE
170	SW1130 METER		1	1"X3"	1/2"
171	TEST SWITCH TS-1130	(NOTE 1)	1	1"X6"	1/4"
172	SW1212 METER		1	1"X3"	1/2"
173	TEST SWITCH TS-1212	(NOTE 1)	1	1"X6"	1/4"
174	SW1325 METER		1	1"X3"	1/2"
175	TEST SWITCH TS-1325	(NOTE 1)	1	1"X6"	1/4"
176	SW1424 METER		1	1"X3"	1/2"
177	TEST SWITCH TS-1424	(NOTE 1)	1	1"X6"	1/4"
178	SW1523 METER		1	1"X3"	1/2"
179	TEST SWITCH TS-1523	(NOTE 1)	1	1"X6"	1/4"
180	SW1066 METER		1	1"X3"	1/2"
181	TEST SWITCH TS-1066	(NOTE 1)	1	1"X6"	1/4"

CAUTION: THIS PLAN MAY BE REDUCED

0 1 2 ORIGINAL SCALE

REFERENCES:

PLANS

FIELD BOOKS

"PORT OF OAKLAND DATUM"

IS 3.20' BELOW N.G.V.D. '29

CAUTION:

CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D

DRAWN M. LEONG

DESIGNED M. LEONG E 21441

CHECKED W. YEOMAN E 17698

REG. ENGINEER NO.

PORT OF OAKLAND

530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER

REG. ENGINEER NO. C 43841

APPROVED

REG. ENGINEER NO. C 42009

RECOMMENDED

REG. ENGINEER NO. E 17400

OUTER HARBOR

SS-C-48 SWITCHGEAR REPLACEMENT

NAMEPLATE IDENTIFICATION SCHEDULE



DATE: 11-07-2017

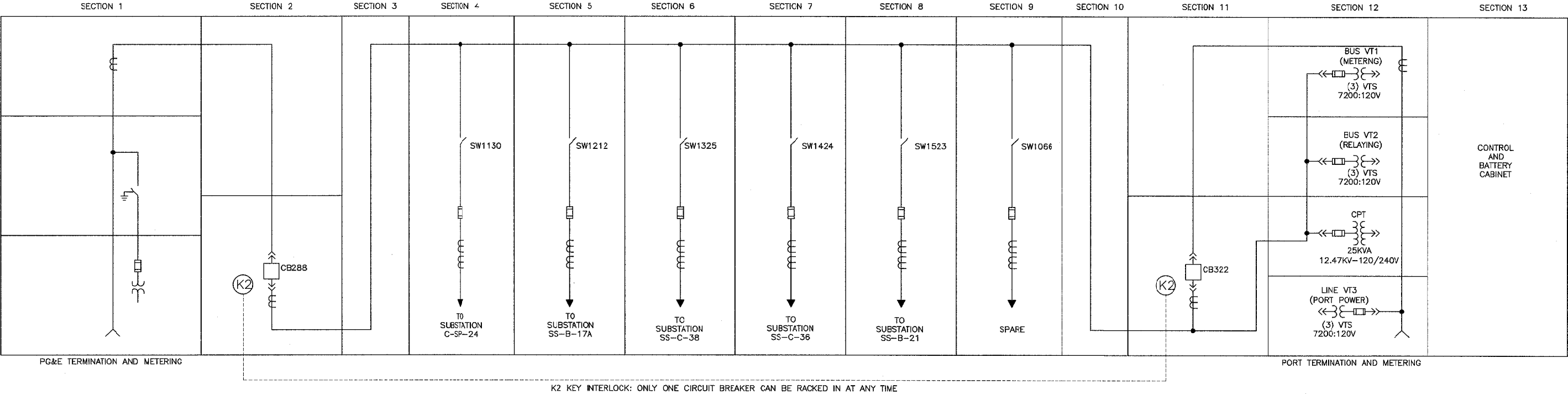
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SHEET: 27 OF 31 SHEETS

E27 AA-4221

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SUBSTATION SS-C-48



DRAWING GENERAL NOTES

- A. PROVIDE TWO PHENOLIC DIAGRAMS MOUNTED ON EXTERIOR OF SECTION 2 AND SECTION 11 FRONT ENCLOSURE DOORS. PHENOLIC DIAGRAMS SHALL BE ENGRAVED WHITE ON BLACK CORE. SIZE SHALL BE AS SHOWN. REFER TO E8 FOR MOUNTING LOCATIONS.

PHENOLIC DIAGRAM

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

- PLANS
FIELD BOOKS
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DRAWN M. LEONG
DESIGNED M. LEONG E 21441
CHECKED W. YEOMAN E 17698

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER
APPROVED
RECOMMENDED

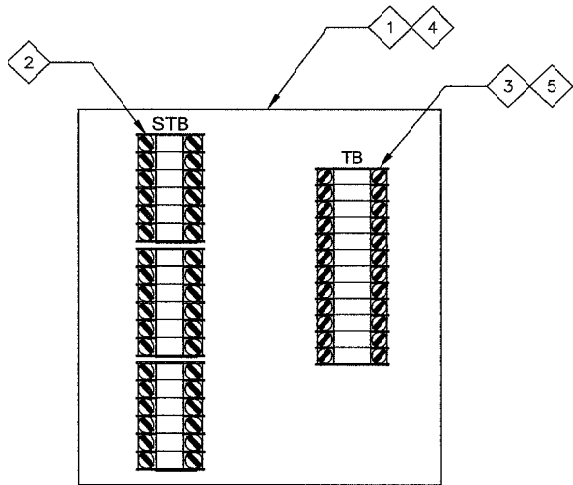
OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
PHENOLIC DIAGRAM DETAIL

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
DATE: 11-07-2017
SCALE: NONE
SHEET: 28 OF 31 SHEETS
E28 AA-4221

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SHEET NOTES

- 1 ANSI 61 PAINTED, SURFACE MOUNTED JUNCTION BOX WITH REMOVABLE FRONT COVER. JUNCTION BOX SHALL BE PRE-WIRED FROM SWITCHGEAR FACTORY. ALL FIELD INTERCONNECTION WIRING FROM LOAD INTERRUPTER SWITCH SECTIONS THAT CONNECT TO DIFFERENT SECTIONS SHALL BE WRED TO TERMINAL BLOCKS IN JUNCTION BOX. JUNCTION BOX SHALL BE SIZED BY SWITCHGEAR MANUFACTURER WITH SUFFICIENT TERMINALS INCLUDING MINIMUM 25% SPARE CAPACITY. ALL FIELD INTERCONNECTION WIRING THAT IS REQUIRED TO BE DISCONNECTED FOR EQUIPMENT DELIVERY SHALL BE DISCONNECTED FROM JUNCTION BOX END AND COILED AT OPPOSITE END FOR INSTALLATION.
- 2 SHORTING TERMINAL BLOCKS FOR LOAD INTERRUPTER SWITCH MULTI-RATIO CT WIRING TO F35 RELAYS.
- 3 TERMINAL BLOCKS SHALL BE SIZED BY SWITCHGEAR MANUFACTURER. PROVIDE MINIMUM 25% SPARE POLES FOR FUTURE USE.
- 4 ALL JUNCTION BOX KNOCKOUTS TO ACCOMMODATE WIRING SHALL BE PROVIDED WITH PLASTIC OR RUBBER BUSHINGS/SLEEVES.
- 5 WIRING TO TERMINAL BLOCK SHALL BE ROUTED INSIDE WIREWAY SYSTEM DESCRIBED ON E9.



TERMINAL JUNCTION BOX FRONT VIEW
(SHOWN WITH COVER REMOVED)

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

NO.	REVISIONS	DATE	REV	APP'D
1	FIELD BOOKS			
2	"PORT OF OAKLAND DATUM"			
3	IS 3.20' BELOW N.G.V.D. '29			
4	CAUTION:			
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DRAWN	M. LEONG	
DESIGNED	M. LEONG	E 21441
		REG. ENGINEER NO.
CHECKED	W. YEOMAN	E 17698
		REG. ENGINEER NO.

PORT OF OAKLAND

530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER	
APPROVED	C 43841
	REG. ENGINEER NO.
RECOMMENDED	C 42009
	REG. ENGINEER NO.
	E 17400
	REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
LIS TERMINAL JUNCTION BOX DETAIL

REGISTERED PROFESSIONAL ENGINEER
MATTHEW F. LEONG
No. E21441
EXP. 03-31-18
STATE OF CALIFORNIA

DATE: 11-07-2017
SCALE: NONE
SHEET: 29 OF 31 SHEETS
E29 AA-4221

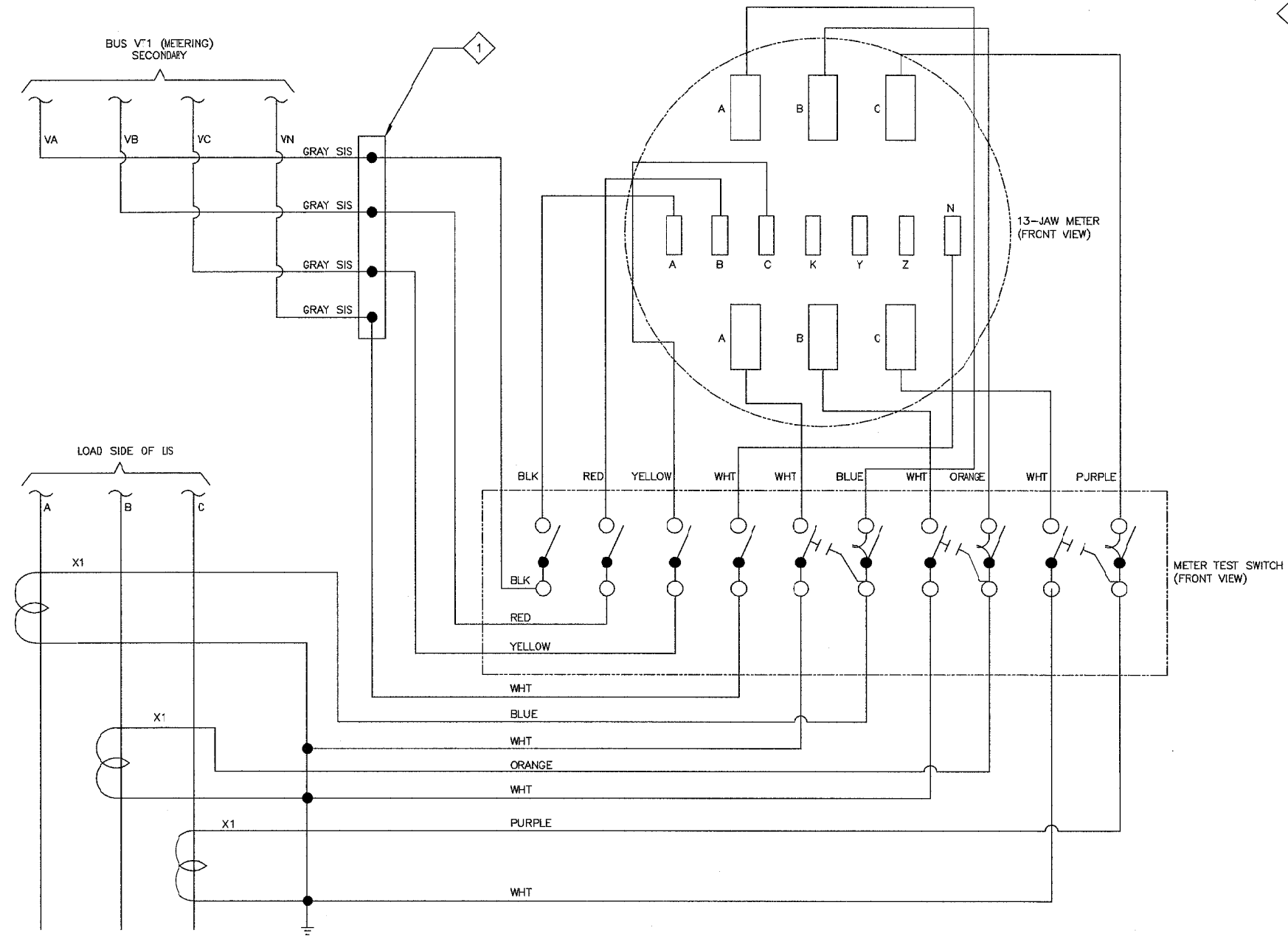
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DRAWING GENERAL NOTES

A. ALL WIRING TERMINATING AT METERS SHALL BE #10 SOLID THHN. SWITCHGEAR MANUFACTURER SHALL FOLLOW WIRING COLOR IDENTIFICATION AS SHOWN.

SHEET NOTES

1 METER VT CONNECTIONS SHALL BE TERMINATED AT TERMINAL BLOCK BEFORE CONNECTION TO METER. LOAD INTERRUPTER SWITCH METER VT CONNECTIONS SHALL BE TERMINATED AT RESPECTIVE SWITCH TERMINAL JUNCTION BOX LOCATED IN SAME SECTION.



CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM"
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NO.	REVISIONS	DATE	REV	APP'D

DRAWN	M. LEONG	E 21441
DESIGNED	M. LEONG	REG. ENGINEER NO. E 21441
CHECKED	W. YEOMAN	REG. ENGINEER NO. E 17698

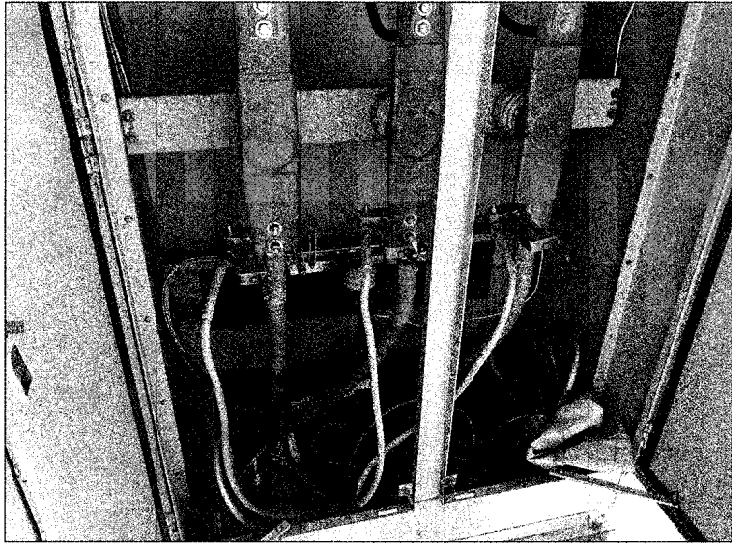
PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER	C 43841
APPROVED	REG. ENGINEER NO. C 42009
RECOMMENDED	REG. ENGINEER NO. E 17400

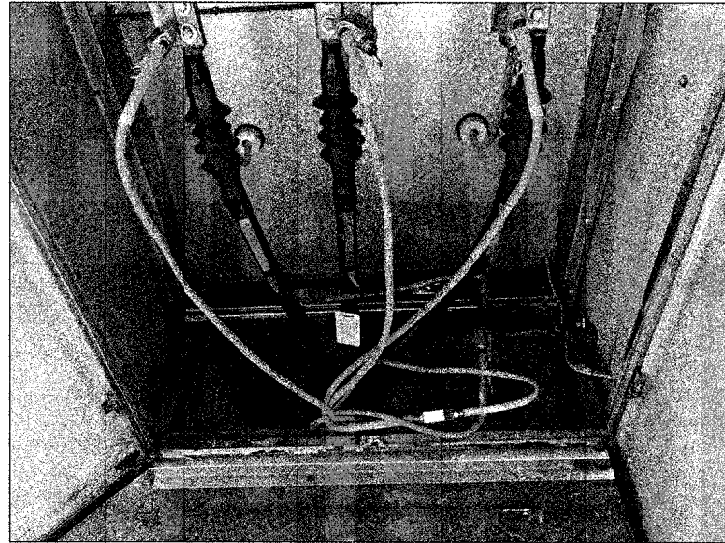
OUTER HARBOR	DATE: 11-07-2017
SS-C-48 SWITCHGEAR REPLACEMENT	SCALE: NONE
METER WIRING DETAIL	SHEET: 30 OF 31 SHEETS
E30	AA-4221



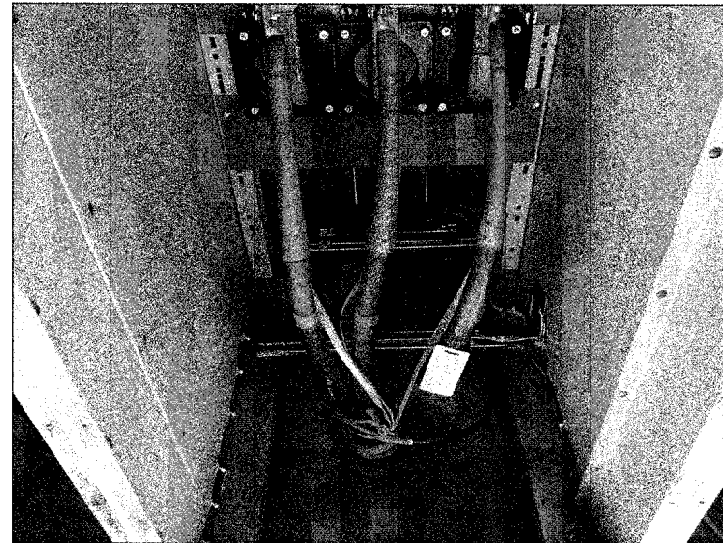
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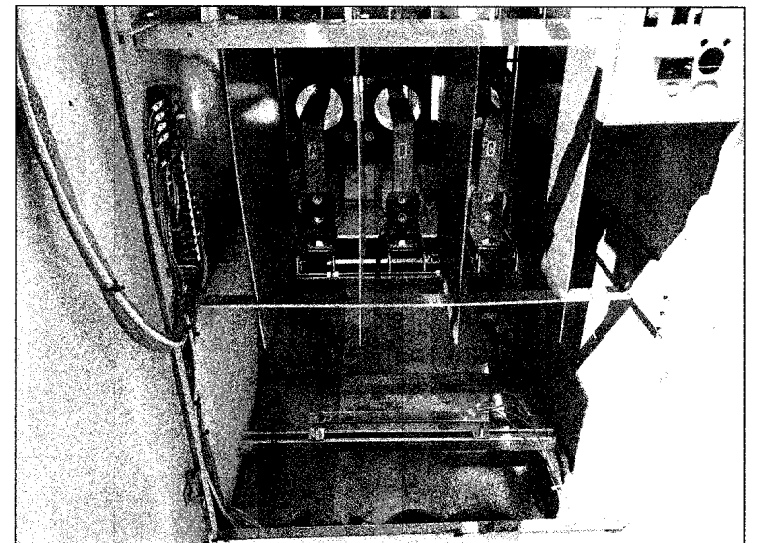
1 SECTION 1 EXISTING UTILITY TERMINATION (REAR)



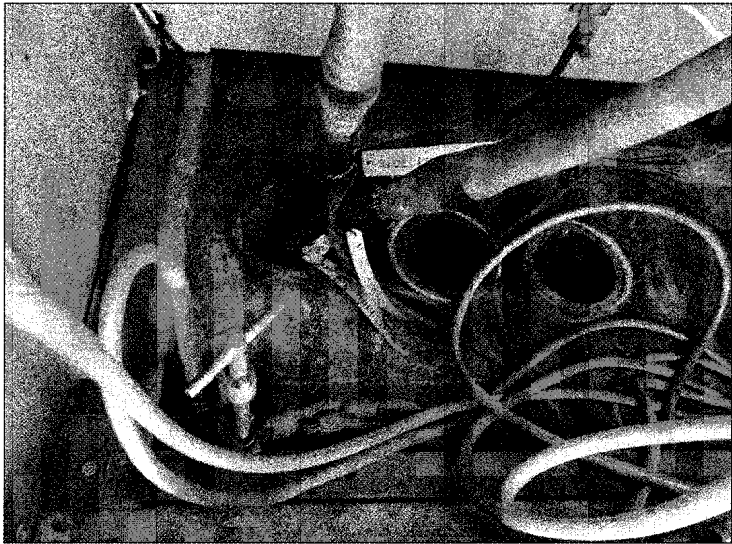
3 SECTION 12 EXISTING PORT TERMINATION (REAR)



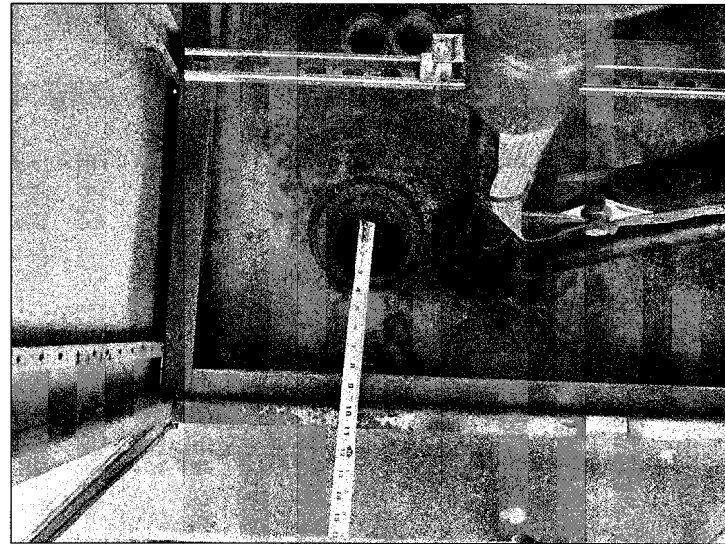
5 SECTION 5 EXISTING SW1212 (REAR)



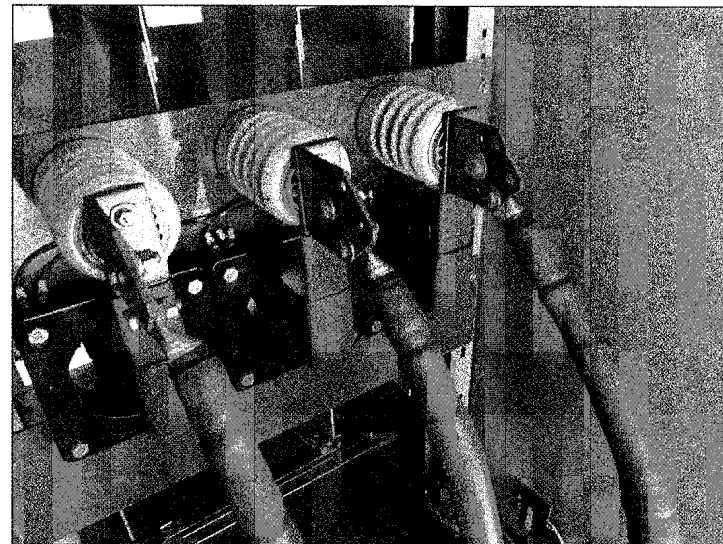
7 SECTION 9 EXISTING SW1066 (FRONT)



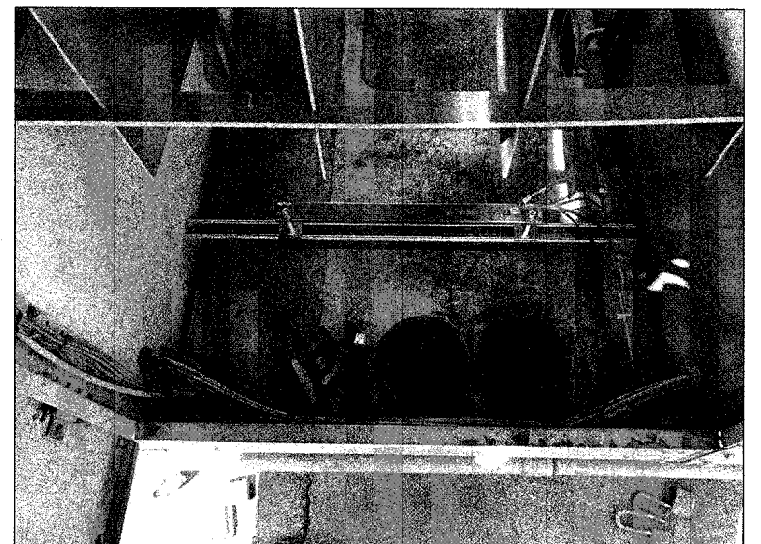
2 SECTION 1 EXISTING UTILITY TERMINATION (REAR)



4 SECTION 12 EXISTING PORT TERMINATION (REAR)



6 SECTION 5 EXISTING SW1212 (REAR)



8 SECTION 9 EXISTING SW1066 (FRONT)

DRAWING GENERAL NOTES

A. PHOTOGRAPH DETAILS OF EXISTING SWITCHGEAR ARE PROVIDED FOR REFERENCE PURPOSES ONLY.

CAUTION: THIS PLAN MAY BE REDUCED

0 1" 2" ORIGINAL SCALE

REFERENCES:

PLANS
FIELD BOOKS
"PORT OF OAKLAND DATUM" IS 3.20' BELOW M.G.V.D. '29
CAUTION: CHECK TRACING FOR LATEST REVISIONS

NO.	REVISIONS	DATE	REV	APP'D

DRAWN	M. LEONG
DESIGNED	M. LEONG E 21441 REG. ENGINEER NO.
CHECKED	W. YEOMAN E 17698 REG. ENGINEER NO.

PORT OF OAKLAND
530 WATER ST. OAKLAND, CALIFORNIA

CHIEF ENGINEER	C 43841 REG. ENGINEER NO.
APPROVED	C 42009 REG. ENGINEER NO.
RECOMMENDED	E 17400 REG. ENGINEER NO.

OUTER HARBOR
SS-C-48 SWITCHGEAR REPLACEMENT
EXISTING SWITCHGEAR PHOTO DETAILS

DATE: 11-07-2017
SCALE: NONE
SHEET: 31 OF 31 SHEETS
E31 AA-4221



PORT OF OAKLAND

**Section 16342
Medium Voltage Metal –Clad Switchgear**

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

Section 16342 Medium Voltage Metal-Clad Switchgear

SECTION 16342

MEDIUM VOLTAGE METAL-CLAD SWITCHGEAR**PART 1 – GENERAL**

1.01 SUMMARY

This Section includes the technical requirements for the design, fabrication, testing, and delivery of NEMA 3R outdoor, metal-clad switchgear assemblies, including draw-out circuit breaker sections complete with vacuum circuit breakers and all components and functions described herein.

1.02 RELATED SECTIONS

- A. Section 16195, *Electrical Identification*
- B. Section 16343, *Medium Voltage Load Interrupter Switchgear*

1.03 SYSTEM REQUIREMENTS

Metal-Clad switchgear must be integrated with existing site conditions including equipment pads, conduits, power cables, control wires, transformer secondary bus connections and transformer secondary throat enclosure as shown in Plans. The Switchgear Manufacturer shall coordinate equipment dimensions to fit within the footprint of existing equipment pads and not conflict with existing infrastructure.

1.04 REFERENCES

The following references are incorporated into the requirements of the Work as described herein.

- A. Institute of Electrical and Electronic Engineers (IEEE):
 - 1. 693, *IEEE Recommended Practices for Seismic Design of Substations*
 - 2. C37.04, *Standard Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis*
 - 3. C37.11, *Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis*
 - 4. C37.20.2, *Standard for Metal-Clad and Station-Type Cubicle Switchgear*
- B. National Electrical Manufacturers Association (NEMA):
 - 1. C29.1, *Test Methods for Electrical Power Insulators*
 - 2. C29.10, *Wet Process Porcelain Insulators - Indoor Apparatus Type*
 - 3. ICS 6, *Industrial Control and Systems: Enclosures*
 - 4. SG 4, *Alternating-Current High-Voltage Circuit Breakers*

- C. State of California.
 - 1. California Building Standards Code (CBC)
 - 2. California Electric Code (CEC)
- D. American National Standards Institute (ANSI) Z535, *Safety Alerting Standards*
- E. Pacific Gas and Electric Company (PG&E) 2016 Electric & Gas Service Requirements
- F. Equipment Utility Service Requirements Committee (EUSERC) Section 400, *Medium Voltage Metering & Service Equipment*

1.05 SUBMITTALS

- A. Submit With Bid
 - 1. Provide outline drawings that show the following information and details –
 - i. Layout and dimensions of switchgear cubicles and of the NEMA 3R switchgear assembly and conduit entry locations.
 - ii. Equipment shipping splits.
 - 2. Refer to submittal requirements in Section 16343, *Medium Voltage Load Interrupter Switchgear*.
- B. Submit After Bid Award
 - 1. Submit Switchgear Product Data, Outline Drawings, Switchgear and Related Equipment Drawings, Wiring Diagrams, and other information listed below. Do not begin fabrication until written approval by Engineer is received).
 - a. Provide product data for switchgear and related equipment, including features, accessories, characteristics, and ratings for individual components, switchgear breakers, AC panels, DC panels, CTs, PTs, CPTs, protective relays, power meters, control relays, time delay relays, lockout relays, test switches, uninterruptable power sources, rectifiers, terminal blocks, indicating lights, alarm horns, pushbuttons, Ethernet switch, satellite clock and antenna, and all components shown in Plans and Specifications.
 - b. Provide outline drawings that show the following information and details –
 - i. Location and dimensions and identification of switchgear cubicles and components of the NEMA 3R switchgear assembly, and conduit entry locations, cable and bus termination details.

- ii. Overall dimensions of NEMA 3R switchgear assembly.
 - iii. Weight of individual sections and fully assembled operational NEMA 3R switchgear assembly.
 - iv. Installation details including picking locations
- c. Provide Switchgear and Related Equipment Shop Drawings. The drawings must include dimensioned plans, elevations, sections, details, required clearances, and noted service space around equipment. All structural drawings must bear the seal of a Structural Professional Engineer currently licensed in the State of California. Show method of field assembly and location and size of each field connection, including the following:
- i. Single-Line, Three-Line, Control Elementary drawings.
 - ii. Tabulation of installed devices with features and ratings.
 - iii. Outline and general arrangement drawing showing dimensions, shipping sections, and weights of each assembled section.
 - iv. Drawing of cable and bus termination compartments showing preferred locations for conduits and indicating space available for cable terminations.
 - v. Floor plan drawing showing locations for anchor bolts.
 - vi. Current ratings of buses.
 - vii. Short-time and short-circuit ratings of switchgear assembly.
 - viii. Device and test switch nameplate schedules.
 - ix. Location of terminal blocks to be used for field wiring and for connections to the control system.
- d. Provide Wiring Diagrams. For switchgear and related equipment, show, at minimum -
- i. Power, signal, and control wiring.
 - ii. Three-line diagrams of current and voltage secondary circuits showing device terminal numbers and internal diagrams.
 - iii. Schematic control diagrams.
 - iv. Point to point wiring diagrams showing connections of component devices and equipment including field terminations for related equipment
- e. Provide the Manufacturer Seismic Qualification Certification. Submit certification that switchgear, accessories, and components will withstand seismic forces defined in Article 2.03, *Seismic Requirements* including the following -

- i. Indicate whether the "withstand" certification is based on actual test of assembled components or on calculation. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - ii. Include dimensioned plans of the equipment unit, identify the center of gravity, and locate and describe mounting and anchorage provisions.
 - iii. Detailed description of equipment anchorage devices and anchor requirements on which the certification is based and anchorage installation requirements.
 - f. Refer to submittal requirements in Section 16343, *Medium Voltage Load Interrupter Switchgear*.
2. At least two weeks prior to Factory Acceptance Testing (FAT), submit the following Pre-FAT Information -
 - a. The most recent point-to-point diagram for use during factory acceptance testing.
 - b. Test procedure for review and approval.
3. At time of shipment, for each switchgear assembly, submit Switchgear Time of Shipment Test Reports.

The Switchgear Manufacturer must submit the supplier's certified factory test reports for all specified tests and IEEE and NEMA required tests at time of shipment. All testing must comply with the latest NETA acceptance testing procedure. These test reports must include, but not necessarily be limited to:

 - a. Material Test Reports: IEEE and NEMA prescribed factory tests for each switchgear and related equipment according to Part 2 "Source Quality Control" Article.
 - b. Quality-control test reports: Certified test reports confirming complete IEEE and NEMA series test results.
4. Due at time of shipment of the first switchgear assembly, submit a Switchgear and other Equipment Sample Warranties meeting the requirements of Article 1.07 of this Section.
5. Due at time of shipment, for each switchgear assembly, submit Switchgear Manuals and Accessories, including the following:
 - a. Instruction Manuals: Furnish three complete sets of instruction manuals, including parts lists, for the circuit breakers and all devices and equipment furnished. The manual must give complete and detailed instructions for erection, installation, and adjustment.

Provide one instruction manual located in a pocket attached to the inside of the NEMA 3R switchgear assembly, and two manuals with final documentation.

- b. Operation and Maintenance Manuals and Data: Provide two hard copies and two DVDs with .pdf copies with each switchgear shipped. Include the following:
 - i. Manufacturer's written instructions: Include instructions for testing and adjusting circuit breakers, overcurrent protective devices, and switchgear components.
 - ii. Time-current curves: Include curves for selectable ranges for each type of overcurrent protective device.
 - iii. Setting Files: Include multi-function protection relay setting files in hard copy printout and recordable CD format.
 - iv. Software: Provide all required programming software (i.e. Multi-function Protection Relay etc.) installation disks with licenses and all necessary drivers.

1.06 ADDITIONAL MATERIALS

Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- A. Fuses: Furnish three of each type and rating used for each switchgear assembly. Include spares for control power transformers, voltage transformers, control power circuits, and all fusible devices.
- B. Lockout Relay: Furnish two for switchgear assembly.
- C. Protection Relays:
 - GE F60-J00-HKH-F8L-H6E-MXX-PXX-UXX-WRH: Furnish one spare
 - GE F35-J00-HKH-F8L-H6E-M8N-PXX-U8N-WRH: Furnish one spare
- D. Timers: Furnish two repeat cycle timers and two interval timers.
- E. Indicating lamps: 2 of each type and color
- F. Maintenance Tools: Furnish tools and miscellaneous items required for switchgear test, inspection, maintenance, and operation. Include the following for each switchgear assembly:
 - 1. Fuse-handling tool for each different fuse size used.
 - 2. Racking handle to move circuit breaker manually between connected and disconnected positions.
 - 3. Motor driven, remote, racking operator shall be provided for racking the breaker in and out of the cubicle.

- G. Furnish Laptop Computer to include
 - 1. Protection Relay Parameters Setting Programs
 - 2. Any software required to configure network switch and satellite synchronized clock unit
 - 3. 14" screen, 16GB RAM, Intel Core i7 processor, 512 GB SSD, Windows 10 Pro 64, WiF/Bluetooth 802.11AC + Bluetooth 4.1
 - 4. Approved Manufacturers: Sony, Lenovo, Toshiba or Approved Equal.

1.07 REGULATORY REQUIREMENTS

UL Safety Standards: All components shall be listed, labeled or approved where applicable. The entire assembly shall be UL labeled as a complete assembly.

1.08 QUALITY ASSURANCE

Products shall be listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.09 WARRANTY

The Switchgear Manufacturer must provide warranties against defects in material, workmanship, and operation as follows:

- A. Switchgear enclosures for coating adhesion and integrity as per ASTM Standards under normal operating conditions for a period of 20 years.
- B. A minimum of 12 months from final acceptance by the Port for all other products listed under PART 2 of this Section.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Unless stated otherwise below, the following manufacturers are acceptable:
 - 1. ABB
 - 2. IEM
 - 3. Powell
 - 4. Powercon
 - 5. Siemens
 - 6. Eaton Corporation; Cutler-Hammer Products
 - 7. General Electric Company
 - 8. Schneider Electric; Square D Products

9. MCM Engineering II, Inc.
10. Myers Power Products, Inc.
11. Approved Equal.

2.02 PERFORMANCE CRITERIA

Switchgear must have the following ratings:

- A. kV, nominal 15kV.
- B. kV, maximum - 15kV.
- C. kV, BIL - 95kV.
- D. Power frequency - 60 Hertz
- E. Power frequency withstand - 36kV, 1-minute test
- F. Main bus continuous, amperes - 1200A.
- G. Short-circuit ratings -
 1. Amperes, RMS symmetrical maximum: 25kA.
 2. MVA three-phase symmetrical at rated nominal voltage: 500.
 3. Duty-cycle fault-closing amperes, RMS asymmetrical: 37kA.
 4. Momentary Current Ratings: Equal to the circuit breaker close and latch rating.
 5. System Grounding: Low resistance

2.03 SEISMIC REQUIREMENTS

The Manufacturer must provide equipment and anchor bolt design with certification to meet the building code and IEEE 693, per Earthquake Design Criteria for project site as listed below. The Manufacturer must provide seismic calculations prepared by California Registered Professional Engineer to establish anchor bolt requirements.

The existing equipment pad details will be provided to perform such calculations. Refer to reference drawing provided.

<u>EARTHQUAKE DESIGN CRITERIA</u>	<u>DATA</u>
Occupancy Category	III
Seismic Importance factor	I = 1.0
Location (Latitude / Longitude)	37.89049 Lat -122.326981 Lon

Seismic design Category	D	
Site Coefficients	FA = 1.0	FV=1.5
Mapped Spectral Response Accelerations	SS = 1.5	S1 = 0.90
Spectral Response Coefficients	SDS = 1.000	SD1 = 0.600

2.04 OUTDOOR NON-WALK-IN ENCLOSURE

- A. Enclosure must be of outdoor non-walk-in construction - Enclosure and switchgear must be completely factory-built, assembled, wired, and tested. All equipment and components must be new and suitable for continuous operation in a marine environment.
- B. Cubicles are to be designed to allow front and rear access and must not require the routing of line side or load side connections in front of the compartments.
- C. Switchgear enclosure must be rated for outdoor application with ventilated construction. Enclosure must have full-height, gasketed, pad-lockable doors with 3-point latches.
- D. The enclosure must be weatherproofed by gaskets and sealing the end covers, rear and front covers and other locations to prevent entrance of moisture.
- E. Switchgear enclosure must have weatherproof roof flashing and components between shipping/lifting splits such that all seams are protected from moisture ingress.
- F. The entire assembly must be UL labeled as a complete assembly.
- G. Materials and Construction:
 - 1. All facets of construction through coating and weatherproofing must be performed indoors, protected from outdoor weather conditions. Construction of the equipment out-of-doors is not acceptable.
 - 2. All permanent components must consist of materials that do not freely support combustion. Use of wood or any other materials that freely support combustion is not allowed as permanent components.
- H. Switchgear Low Voltage Circuits
 - 1. All low voltage electrical circuit components must be UL listed and recognized devices.
 - 2. All low voltage circuits must be functionally tested by the manufacturer prior to completion. The Manufacturer must provide certification that all systems have satisfactorily completed functional testing.
 - 3. Fuse protection

- a. Control power circuits, heater circuits, and voltage transformer-secondary circuits shall be equipped with individual fuse protection, unitized by function. Enclosed pull-type fuse holders with insulating cover shall be used for control and voltage transformer circuits.
 - b. Individual fuse blocks or holders shall be identified by nameplates as shown on nameplate schedules found on Plans.
- 4. Provide enclosed and gasketed fluorescent fixture in each section of the switchgear assembly controlled by manual light switch as shown on Plans. Fixtures shall be mounted inside the enclosure vestibule, above each vertical section to maintain an illumination level of 30 footcandles on front faces of compartments. Fixtures shall be fluorescent type, rated for 120VAC operation. SIMKAR MINI, HOFFMAN PANELITE, or Approved Equal. Lights shall be controlled from a single light switch. Light switch specification grade 20A 125V.
- 5. Duplex receptacles are to be specification grade 20A 125V ivory GFCI duplex type, located as shown on Plans.
- 6. Wire type
 - a. Power wiring #12 AWG minimum (sized as required by the electrical code by manufacturer).
 - b. Switchgear internal wiring must be type SIS.
 - i. All AC control wiring shall be color coded as follows:

120VAC: L1 Black, N White
240VAC: L1 Black, L2 Red
 - c. Ground conductors must have continuous outer finish that is green.
 - d. Secondary wiring shall be armored where passing through primary compartments.
 - e. Crimp-type, nylon-insulated ring-tongue lugs shall be furnished on all wire ends. Lugs shall be crimped on wires using a ratchet-type crimping tool to ensure that full crimp cycles are completed.
 - f. Unless otherwise required (e.g.: for CT circuits), wiring terminal blocks shall be front-connected, sliding-link blocks with nickel-plated brass contacts, inter-pole barriers and swing-out white marker strip; States M25012 or approved equal.
 - g. All wiring shall be tagged in accordance with wire numbers shown on Supplier's wiring diagrams. Wire markers shall be machine-imprinted, slip-on sleeves.
- 7. AC 120/240V and DC 125V panelboard

- a. Provide dead-front lighting and appliance panelboard suitable for use as service equipment.
 - b. Panelboard shall have copper bus bars, full sized neutral bar and bare uninsulated grounding bar suitable for bonding to enclosure.
 - c. Provide suitable lugs on neutral and ground busses for each outgoing feeder circuit. Lugs shall be of the anti-burn solderless pressure-type connectors approved for copper conductors.
 - d. Panelboard shall be arranged for connecting incoming feeder from CPT secondary circuit breaker.
 - e. Provide required circuit breakers as indicated on Plans.
 - f. Breakers shall be bolt-on, heavy-duty, quick-make, quick-break, single-pole or two-pole as indicated on Plans.
 - g. Provide galvanized sheet steel, NEMA 1, code gage thickness enclosure with multiple knockouts and wiring gutters. Enclosures shall be of the same manufacturer and shall mate properly with panelboard interiors.
 - h. Provide panelboard fronts with adjustable indicating trim clamps, concealed piano-type door hinges, and doors with flush locks and keys. All panelboard enclosures shall be keyed alike.
 - i. Equip with interior circuit-directory frame and 8.5" x 11" panel directory with clear plastic covering.
 - j. Provide baked gray enamel finish over a rust inhibitor coating.
 - k. Surface mount as indicated in Plans
7. Wiring circuits-Provided by Manufacturer:
- a. Shall be wired using wire duct cable organizers, Panduit or Approved Equal. Wireways shall be minimum 2.5", sized for maximum 40% fill.
 - b. Shall include:
 - i. AC wiring to enclosure interior lighting
 - ii. AC wiring to receptacles
 - iii. AC wiring to switchgear enclosure space heaters
 - iv. DC wiring to circuit breaker charging circuits
 - v. DC wiring to circuit breaker control
 - vi. DC wiring to circuit breaker tripping circuits
 - vii. AC and DC wiring to protection relays

viii. All AC and DC control wiring as shown in Plans

I. Infrared Viewing Windows

1. Provide infrared viewing windows in each medium voltage cable entrance compartment. More than one view port may need to be in each location to allow viewing of all equipment in that section. The Manufacturer shall determine the proper location for installation of the view ports based on the switchgear layout and viewing window of the view port.
2. 4-inch diameter, outdoor rated, FLUKE CV400 or Approved Equal.

2.05 MATERIALS AND EQUIPMENT- SWITCHGEAR

- A. Switchgear units must be arranged as shown on project Plans.
- B. The switchgear assembly must be metal-clad construction with power bus, draw-out circuit breaker sections, cable termination and auxiliary compartments. Instrument transformers, relays, control wiring, accessory devices and connections must be provided as described herein and as shown on the Plans.
- C. Construction stationary structure:
 1. In establishing requirements for the enclosure design, consideration must be given to all relevant factors such as controlled access; tamper resistance; corrosion resistance; protection from ingress of rodents, insects, and weeds; and the possibility of arcing faults within the enclosure.
 - a. The switchgear line-up must be comprised of the required number of metal-clad sections, bus-connected and integrated to the metal-enclosed switches, assembled together to form a rigid self-supporting structure with barriers of painted steel between units.
 - b. Each metal-clad section must consist of the required number of substructures; segregated by grounded metal barriers into separate compartments for incoming connections, outgoing connections, circuit breakers, instrument transformers, main bus, instruments and relays.
 - c. The switchgear manufacturer must minimize the footprint of the proposed switchgear lineup by stacking VT/CPT as shown on Plans.
 - d. The enclosure dimensions shown on the Plans reflect exact width and minimum depth requirements of equipment. Switchgear manufacturer shall fabricate equipment to the dimensions shown on Plans.
 2. Doors and panels:
 - a. Each exterior door must be provided with a formed, hinged, front door with handle, 3-point latch and provisions for padlocking. All exterior handles and hardware shall be stainless steel. Each

exterior door must be furnished with a stop to hold the door in the open position. Circuit breaker and instrument transformer compartment doors must not hinder withdrawal of the element from the compartment when the door is open and door-stop set.

- b. Each interior control section door must be designed and installed to swing open 180 degrees. Each control section door must be furnished with a stop to hold the door in the open position.
 - c. Switchgear mimic bus diagram must be permanently affixed to the front of the switchgear as per Section 16195, *Electrical Identification*.
 - d. No energized parts are to be within normal reach of the opened doorway. Energized bare parts, including, but not limited to, protective relays, lockout relays, test switches and LEDs, mounted on doors must be guarded where the door must be opened for maintenance of equipment.
 - e. Relays, instruments, meters, and secondary control devices must be mounted on formed front-hinged doors provided with handle lockable latch, and stop to hold panel in the open position. Equipment mounted on the door must be isolated by grounded metal barriers from all primary circuit elements.
 - f. Access to main bus, incoming service connections, feeder cable terminations, current transformers, bushings, and other stationary devices must be provided with gasketed, hinged, bolted doors.
 - g. Nonmetallic dust filters must be provided at ventilation louvers. Dust filters must have a minimum Minimum Efficiency Reporting Value (MERV) rating of 8.
3. Circuit breaker compartments:
- a. Circuit breaker compartment must be designed to house a draw-out type circuit breaker element. Welded horizontal guide rails must be provided for rolling circuit breakers into designated positions and completely out of the compartment to ground level.
 - b. Circuit breakers must be dead-front construction equipped with an integral steel-front panel. The breaker front panel shall effectively close the breaker compartment opening when in the connected position.
 - c. The circuit breaker compartment must be closed-door-draw-out design, to allow the breaker to be racked between positions with the front door closed for safety. Breaker position indicator must be viewable from the front with the compartment door closed and latched.
 - d. A manually operated jackscrew racking mechanism must be provided in each breaker compartment to move the breaker between the Connected and Test/Disconnected positions.
 - e. A motor driven, remote, racking operator must be provided for

- racking the breaker in and out of the cubicle. Motor drive mounting hardware must be installed for use of the remote drive at each circuit breaker compartment.
- f. Provide self-coupling primary and secondary contacts at each circuit breaker compartment.
 - g. Automatic shutters must be provided in the compartment to prevent accidental contact with the stationary primary disconnecting contacts when the circuit breaker element is withdrawn from the connected position.
 - h. A ground bus must extend into the compartment to automatically ground the circuit breaker frame in the Connected and Test positions. The ground bus must maintain grounding of the circuit breaker frame during the transition between all positions.
 - i. Means must be provided for positively holding the circuit breaker element in place when it is in either the Connected or Test/Disconnected position within the compartment. Mechanical interlocks must also prevent incorrect movement of a closed circuit breaker to or from the designated positions within the compartment, and prevent electrical closing of the circuit breaker within the compartment unless it is in the Connected or Test position.
 - j. Provision must be made for padlocking the circuit breaker element in the Test/Disconnected position with a 1/4 inch diameter x 1 inch shackle padlock. Circuit breaker positions must be clearly identified.
 - k. Circuit breaker compartments must only permit the interchange of circuit breaker removable elements of the same type and rating.
4. Voltage transformer compartment: Draw-out type with roll-out trays designed to house the specified transformer assembly. All connections to roll-out voltage transformer trays must be rigid bus bars insulated to full voltage rating of switchgear assembly. The compartment door must be furnished with interlock to prevent access to the transformer and primary fuses unless they are disconnected from the primary circuit. Means must be provided to prevent accidental access to the stationary primary contacts when the transformer and fuses are not in the connected position.
 5. Main bus:
 - a. The main three-phase bus must be comprised of tin plated electrical grade copper. The bus must be fully insulated over its entire length with flame-retardant, non-hygroscopic, track-resistant insulation. All bus connections, including bus taps and circuit breaker tap connections, must be tin-plated copper, with current density equal to 1000A per sq. in. (155a.cm²) of cross-section.
 - b. The main bus and connections must be braced to withstand the mechanical stresses associated with rated short-circuit

momentary currents without deformation or damage to supports.

- c. Bus compartments with metal-enclosed sections must be isolated to metal-clad switchgear standards and all bus bars within the metal-enclosed sections must be insulated per metal-clad standards.
6. Ground bus: A tin plated copper ground bus, not less than 2-inches x 1/4 inch, must extend the length of the switchgear sections. All joints in the ground bus must be made with a minimum of two bolts. Station ground connection points must be located in each end section. Ground bus assembly must be capable of withstanding rated momentary fault current without damage.
- a. Provide ground bus extensions including ground ball studs in front and rear of termination and switch sections as shown on Plans.
7. Phenolic drawing and device nameplates: Furnish as indicated in Plans.
- a. Device nameplates shall be black letters on white background. Include a master nameplate that indicates equipment ratings, manufacturer's name, shop order number and general information.
 - b. Drawing phenolic shall be white text/schematic on black background as shown in Plans.

D. Medium-voltage AC circuit breakers:

- 1. Circuit breakers must comply with requirements given in IEEE C37.04 and C37.11, and NEMA SG 4.
- 2. Type: The circuit breakers must be indoor, three-pole, draw-out type, with sealed vacuum, universal AC/DC motor-charged spring-operated mechanisms. Opening and closing speed must be independent of the operator or of control voltage within the rated control voltage range. Circuit breakers of the same rating must be physically and electrically interchangeable.
- 3. Ratings: The circuit breakers must be rated on a symmetrical current basis and have the following ratings and required related capabilities and defined in IEEE C37.04:
 - a. Nominal operating voltage, RMS: as shown on the Plans.
 - b. Rated maximum voltage, RMS: 15kV.
 - c. Insulation Withstand, Crest: 95 kV
 - d. Rated continuous current at 60 Hz amperes, RMS: 1200A
 - e. Required symmetrical current interrupting capability at nominal operating voltage (12.47 kV), RMS, minimum: 25kA.

- f. Required closing and latching capability, RMS, minimum: 65kA.
 - g. Rated interrupting time, cycles, maximum: 3.
- 4. Acceptable products include:
 - a. Square-D, VR-15050-12, no substitutions allowed
- 5. Insulation structure: Materials used for circuit breaker insulation must be of a type that is noncombustible, non-hygroscopic and tracking resistant. The mechanical strength and physical characteristics of the insulation structure must match the stresses imposed by the circuit breaker required closing and latching current capability.
- 6. Removable assembly:
 - a. The circuit breaker removable elements must be truck-mounted with pull-bar or handles suitable for manual removal and insertion of the element out of and into the stationary compartment.
 - b. The removable element must be provided with a fully interlocked, manually-operated racking mechanism to move the circuit breaker between the Test/Disconnected, and Connected positions. A clearly-visible position indicator must be provided.
 - c. Inserting a circuit breaker of incorrect rating in a circuit breaker compartment must not be possible.
 - d. The removable element frame must be provided with a full front metal shield to prevent access to any live primary bus or load terminals when the circuit breaker is in the "Connected" position.
 - e. The circuit breaker removable element's primary disconnecting contacts must be provided with heavy-duty, self-aligning, spring-loaded, silver-plated, copper disconnect fingers that engage with the line- and load-side stationary disconnecting contacts.
 - f. The circuit breaker interrupters must be provided with means for determining contact wear without dismantling.
 - g. Control wiring connections, from circuit breaker compartment to the removable element, must have provisions for maintaining or automatically reinstating circuit continuity when the removable element is moved between the Connected and Test positions. Suitable means must be provided for simultaneous disconnection of control wiring connections when the removable element is fully withdrawn from the compartment.
 - h. Circuit breaker auxiliary contacts must be used instead of cell-mounted mechanism operated contacts for each breaker. The auxiliary contacts must be wired through the automatic secondary disconnect system. A 12-contact (6-"a", 6-"b") truck operated contact actuator and switch assembly must be provided to indicate when the breaker is in the fully connected position, for each breaker. Provide 25% spare contacts and wired to terminal blocks

for easy access and future use.

7. Operating mechanism:

- a. The circuit breaker operating mechanism must be of the motor-charged, spring-operated type. The design of the mechanism must prevent overcharging and ensure that the release of stored energy for closing the circuit breaker main contacts is prevented unless the mechanism has been fully charged. The design must be mechanically trip-free. Energy storage must be sufficient for an opening-closing-opening operation at the maximum symmetrical current interrupting capability of the circuit breakers.
- b. The spring-operated mechanism must be automatically recharged within 15 seconds after each circuit breaker closing operation. The mechanism must have provisions for manually charging the closing springs.
- c. The stored-energy mechanism must be provided with a mechanical indicator to show the Charged and Discharged status of the closing springs. An interlock must be provided to prevent the complete withdrawal of the circuit breaker removable element from the stationary compartment when the mechanism is in a fully charged state; or alternatively, automatically discharge the stored energy when the removable element is withdrawn from or inserted into the compartment.
- d. Each mechanism shall be provided with four-digit, non-resettable mechanical register type operation counter to record each circuit breaker close/open cycle.

8. Circuit breaker control:

The circuit breakers shall be designed for local electrical operation at 125 volts DC nominal control power supply.

9. Control Relays

The control relays shall be heavy duty industrial, din-rail mount, with contacts minimum rating 600VAC, 20amps, minimum of 4 output contacts as indicated on Plans with a minimum of 25% spare output contacts Allen-Bradley 700S-PK or Approved Equal. Provide control relay adder decks as required.

10. Circuit Breaker Control Switches:

- a. Breaker control Switches must be located as shown on the Plans.
- b. Breaker control switch shall be mounted in a position such that the Control Switch Actuator described in Section 1.06 can be mounted and operated free from any obstructions.
- c. Acceptable products: Electroschwitch Series 24 or Approved Equal

- d. Breaker control switch at the breaker section is not required, except for the associated LED lights (Green and Red LEDs).
- 11. Cell Switches:
 - a. Both truck-operated cell(TOC) switch and mechanism-operated cell(MOC) switch must be provided, and need to be readily accessible. They must be mounted at the front of the circuit breaker cell.
 - b. A minimum of five (5) N.O. and five (5) N.C. MOC and TOC switch contacts must be provided. All spare contacts must be wired to terminal blocks readily accessible within the breaker compartment
- 12. Mechanical Key Interlock:
 - a. Mechanical key interlock system shall be provided between breaker cells for CB288 and CB322 as shown on Plans. Only one circuit breaker shall be able to be racked in at any time.
- E. Control Power Transformer: Control Power transformer must be as shown on the Plans.
 - 1. CPTs must be drawout disconnecting type.
 - 2. The primary of all CPTs must be protected with current limiting fuses, one set for each single-phase or three-phase CPT.
 - 3. The secondary circuit of each CPT must have a main breaker that is mechanically interlocked with the CPT compartment so that the CPT compartment cannot be opened until the main breaker is opened.
 - 4. Acceptable manufacturers include:
 - 1. ABB
 - 2. Cutler-Hammer
 - 3. ITI
 - 4. Siemens
 - 5. Square-D
 - 6. Approved Equal
- F. Current Transformers: CT ratings must be in accordance with IEEE, C57.13 and C37.20.2 and must have an accuracy class of C200 for window type and T200 for bar type, minimum. The CT winding must terminate in a screw type terminal on the CT housing and must be wired to shorting terminal blocks. CTs for metering purposes must be bar type, and for all other purposes must be window type, or as shown on the Plans. CTs must be multi-ratio, dual ratio, or fixed ratio, and set as indicated on the Plans.

Acceptable manufacturers include:

1. ABB
2. Cutler-Hammer
3. ITI
4. Siemens
5. Square-D
6. Approved Equal

G. Voltage Transformers: Voltage transformers must be draw-out type with ratings and accuracy in accordance with IEEE C57.13. PTs must have fused primary and secondary.

Acceptable manufacturers include:

1. ABB
2. Cutler-Hammer
3. ITI
4. Siemens
5. Square-D
6. Approved Equal

H. Relays and instruments: Switchgear assembly must have protective relays with status indication and event history. A trip and lock out IEEE Device 86 must be provided for trip signals to the circuit breaker. Circuit breaker protection and control must comply with the requirements of the single-line diagram and as identified herein.

1. Protective relays must be solid-state microprocessor-based multi-functional type providing monitoring, control, and automation that operate from the secondary of current and voltage transformers. Protective relays must be true RMS sensing of each phase and ground. Relay self-checking functions must be included, with a minimum of 100mps Ethernet connectivity via glass fiber optics.
2. Provide relays as indicated on Plans for each circuit breaker. Relays must have power ride-through modules. All relays must have panel mounted voltage and current test blocks.
 - a. Ground element must be capable of being utilized in residual, zero sequence, or ground source connection schemes, or deactivated.
 - b. Device curves and settings must be independently field selectable and programmable with or without load.
 - c. The relay must store five of the latest 15-cycle events, and event summaries for the latest 20 events. The latest event must be stored in nonvolatile memory.
 - d. Instantaneous, demand and peak demand currents must be

displayed on the front panel.

- e. The relay must be capable of withstanding operating temperatures ranging from -40° to +85°C (-40° to +185°F).
- f. Relay Alarm and/or Trip contacts must not change state if power is lost or an undervoltage occurs. These contacts must only cause a trip upon detection of an overcurrent or fault condition based upon programmed settings.
- g. The relay must be suitable for operating on control power with a nominal input voltage of 120 volts AC. The power source will be from an uninterruptible power supply.
- h. Acceptable products:
 - i. General Electric, Multilin F60, GE F60-J00-HKH-F8L-H6E-MXX-PXX-UXX-WRH, no substitutions allowed
 - ii. General Electric, Multilin F35, GE F35-J00-HKH-F8L-H6E-M8N-PXX-U8N-WRH, no substitutions allowed

I. Test Switches

1. Provide test switches that will completely isolate all Protection Relays from power, inputs, outputs, current signals and potential signals and all Power Meters from current signals and potential signals. Current switches must have make-before-break current short circuit feature. Test switches must be grouped by function and as shown on Plans. ABB FT-1 or Approved Equal.
 - a. Test switch configuration shall be arranged as shown on Plans.
 - b. Test switch handles shall be colored black for current poles and colored red for voltage poles.
 - c. Test switch cover shall be clear
2. Provide nameplate under each test switch to identify function and device terminal connection. Nameplate must be white core with black text.

J. LED Indicating Lights

1. Indicating lights shall be LED type, separate from other devices and provided for each electrically operated circuit breaker and lockout relay. Green indicating lights shall indicate the breaker open position. Red indicating light shall indicate the breaker closed position. Blue indicating lights shall indicate that the breaker spring is charged. Amber indicating lights shall be provided to monitor lockout relay coils for continuity and presence of control power.
2. Ratings: 120VAC input or as shown in drawings.
3. 30mm diameter, flush button, press-to-test feature

4. Acceptable Products: Cutler Hammer 10250T Series, Allen-Bradley 800H, or equal.

K. Pushbuttons

1. Corrosion resistant, heavy-duty, and water-tight/oil-tight
2. Momentary, flush button, black, non-illuminated, 30mm diameter, NEMA Type 4/13 rated, momentary contact, flush head, 1 N.O. and 1 N.C. contacts
3. Acceptable Products: Cutler Hammer 10250T Series, Allen-Bradley 800T/H, or Approved equal.

L. Time Delay Relays

1. Repeat Cycle (ON time first, followed by OFF time and repeating)
 - a. Coil voltage 120V AC/DC, two Form C contacts, 3 to 300 seconds range, DIN rail mounted base
 - b. Macromatic TR-55122-12, or Approved Equal
2. Interval On
 - a. Coil Voltage 120V AC/DC, two Form C contacts, 0.3-30 minutes range, DIN rail mounted base
 - b. Macromatic TR-50522-15, or Approved Equal

M. Alarm Horn

1. Alarm horns shall be completely assembled plug-in units with adjustable output between 88 to 111dB at 1 meter distance.
2. NEMA 4X rated enclosure, operating voltage 125VDC
3. Edwards Signaling 870 Series or Approved Equal

N. Each switchgear section shall have space heaters with space heater monitoring ammeters, sheaths and guards.

1. Space heaters of high-temperature chrome steel shall be provided to maintain temperature in accordance with manufacturer's tolerances inside the enclosure.
2. Each heater shall be rated 500W at 240VAC, for use at half voltage for long life, capable of providing 125 watts for each heater equipment unit.
3. The quantity of heaters in each section shall be calculated by switchgear manufacturer. A minimum of 2 will be required in each section.
4. Space heaters shall be located at the lowest portion of each space to be

heated and shall be easily accessible for replacement.

5. Space heater monitoring ammeters must be miniature-type, 2% accuracy class, and mounted semi-flush. The ammeter full scale shall be selected so the ammeter operates between 50% and 90% of full scale with the space heaters energized. External zero adjustments shall be provided. Crompton 016 Series, or Approved Equal.
6. Thermostatically-controlled space heaters shall be provided as shown on Plans so that the temperature inside the cubicle will be automatically maintained above the dew point temperature over an ambient temperature range of 0 °F to 104 °F.
7. Description of Space Heater, Ammeter, Pushbutton Operation
 - a. Switchgear Sections 1 through 13:
Each group of space heaters shall have branch circuit protection, be monitored by its own ammeter, and have a series connected momentary, normally closed pushbutton. When operated, the pushbutton shall de-energize the heater circuit to check ammeter movement.
 - b. Battery Cabinet:
Space heaters shall have branch circuit protection, be monitored by its own ammeter and controlled by thermostat. A momentary, normally open pushbutton will be wired in parallel to the thermostat.

O. Power Monitor

1. Energy and demand power meter
 - a. 0.2% revenue class compliant with ANSI C12.20 and IEC 62053-22
 - b. Measured parameters: Voltage L-N, Voltage L-L, Current, Watts, Watt-hours, VARs, VARh, VA, Vah, PF, Frequency, %THD,
 - c. Harmonic analysis and recordings to the 40th order
 - d. 100BaseT Ethernet expandable I/O communications card
2. Electro Industries/GaugeTech, Shark 200
Shark200-60-10-V3-D2-INP100S-X-X, no substitutions allowed

P. DC Undervoltage Relay

1. General purpose single phase DC voltage monitoring for battery system monitoring
2. Powered by line being monitored, without the need for external supply voltage

3. Programmable DC undervoltage setpoint 10V to 150V DC range, 2 form C contacts
4. Bender VME421H-D-1, or Approved Equal

Q. Grounding Studs

1. Provide grounding stud connection with pull-off rubber covers at all medium voltage cable entrance compartments including Utility and Port termination sections and load interrupter switch compartments as indicated on drawings and as required by PG&E and EUSERC requirements
2. Grounding studs must be arranged to not interfere with the installation or removal of cables located in the same compartment.

R. Managed Ethernet Switch

1. Supports 1588v2 timing, UL listed
2. Front-mounted ports, dual Integrated 90 to 250V AC/DC power supplies
3. 4 Gigabit 1000Mbits RJ45 ports, 8 10/100Mbit RJ45 ports, 12 100Mbit ST Multimode Fiber ports
4. GE Multilink ML3000 Series, or Approved Equal

S. Satellite Clock and Antenna

1. Satellite Clock
 - a. Rated for harsh substation environments
 - b. Meets IEEE C37.90 and IEC 60255 protective relay standards
 - c. Universal power supply 85-260V AC/DC
 - d. 1 modulated IRIG-B, 3 demodulated IRG-B time ports.
 - e. SEL-2407, or Approved Equal.
2. GNSS Antenna
 - a. Weatherproof and water resistant, rated for outdoor use
 - b. Capable of receiving signals from both GPS and GLONASS satellite constellations.
 - c. SEL-9524B, or Approved Equal.

T. Battery System and Battery Charger

1. Battery System

- a. Vented Lead Acid (VLA), meeting PG&E requirements for Electric Service Interconnection at Primary Distribution Voltage.
- b. Battery rack designed to withstand loading based on zone 4 or IEEE 693 (High Seismic). Battery rack shall be anchored to prevent overturning by lateral forces. Battery rack shall be painted with two coats of acid resistant paint for mounting batteries.
- c. Battery system shall be 120 Ah (minimum). The battery system shall be able to supply all steady-state loads (indicators, relay power supplies, etc.) for a period of 24 hours, culminating with three (3) consecutive Close-Open cycles, including spring-charging, for two circuit breakers. Battery capacity shall be calculated by supplier and approved by Engineer to verify adequacy of the minimum Ah required.
- d. Sized by switchgear manufacturer to provide sufficient energy at 45°F for simultaneously opening two circuit breakers.
- e. Switchgear manufacturer shall provide battery sizing calculation based on IEEE 485-2010 and minimum 8 hours discharge rate using manufacturer software using aging factor of 1.25 and design margin of 1.1 to be clearly shown on calculation.
- f. Adequate louvers with filters shall be provided for the battery compartment to exhaust battery fumes and prevent accumulation of explosive gas inside the compartment in combination with forced ventilation. Operation of forced ventilation shall be provided as shown on Plans. Manufacturer shall supply all components including, but not limited to, hydrogen sensor, thermostat, exhaust fan, etc. Manufacturer shall provide necessary calculations for the required air exchanges inside the battery compartment.
- g. Battery compartment floor shall be provided with battery liquid spill containment all around the battery rack. Floor shall be provided with two coats of acid resistant paint.
- h. The rack mounted station batteries shall be located in a cubicle as indicated. The battery charger shall be installed as indicated.
- i. The batteries shall have a minimum twenty (20) year warranty.

2. Battery Charger

- a. Microprocessor-controlled float type battery charger for use on a 125VDC PG&E approved battery. Battery charger shall be Hindle

Industrial AT10.1, or Approved Equal.

- b. Switchgear manufacturer shall provide charger sizing calculation based on battery size with recharge time of 12 hours assuming charger will support the continuous load as well as recharges the battery simultaneously.
 - c. Charger voltage shall be maintained within plus or minus $\frac{1}{2}$ percent from no load to full load with AC line variations of plus or minus 10 percent and frequency variations of plus or minus 5 percent.
 - d. DC output shall be filtered to minimize dc ripple.
 - e. DC voltmeter and ammeter with a minimum 3-1/2 inch scale and 2 percent accuracy of full scale shall be provided.
 - f. Output current shall be limited to 115 percent of rated output current, even under short circuit conditions at the DC output terminals. Solid state circuit shall have AC and DC transient voltage terminals. AC and DC magnetic circuit breakers shall be provided.
 - g. Circuit breakers shall not be overexcited or actuated under any external circuit condition, including recharge of a fully-discharged battery or short-circuit of charger output terminals.
 - h. Charger shall be capable of continuous operation at rated current at an ambient temperature of 40 degrees C. Output dc current capacity shall match the requirements of the batteries provided.
- U. Permanent "DANGER HIGH VOLTAGE KEEP OUT" signs shall be attached to each exterior door as shown on Plans. Signs shall be 10"H X 14"W, aluminum material finished with lamination. Emedco PD90ABBHTEDALU, or Approved Equal.

V. Finish

- 1. All steel structure members shall be cleaned, rinsed, and phosphatized prior to painting.
- 2. The switchgear shall be painted with an electrostatically applied polyester powder with final baked on average thickness between 1.5 and 2.0 mils and meet NEMA and IEEE requirements for outdoor equipment.
- 3. All exterior surfaces of the switchgear assembly shall be given final finish coats of ANSI 61 gray (as per ANSI Z535) as standard.
- 4. Finish shall have a minimum pencil hardness of 2H as tested per ASTM D3363 and shall pass the ASTM B117 Salt spray test for a minimum of 1000 hours.

5. Touch-up materials - with complete instructions - shall be included with each shipment section of metal-enclosed switchgear for touch-up in the field.

W. Revenue Meters

1. Solid state polyphase meter with non-volatile memory and optical port communication.
2. Class 20, Form 9S, Electronic LCD Display, Demand reset and Test button/LED
3. Itron Centron CP1SL, no substitutions allowed.

2.06 SOURCE QUALITY CONTROL

- A. Before shipment of equipment, perform the following tests and prepare test reports:
 1. Production tests on completed switchgear assembly according to IEEE C37.71.
 2. All switchgear, protection, control, monitoring and alarm functions on switchgear, protection relays, shall be thoroughly tested and demonstrated to the Port for the Port's acceptance.
- B. Customer Equipment Factory Acceptance Testing
 1. Switchgear manufacturer shall provide up to 5 days for Port staff to be on-site at switchgear factory once switchgear assembly, wiring, and functional testing have been completed.
- C. Prepare equipment for shipment.
 1. Provide suitable crating, blocking, and supports so equipment will withstand expected domestic shipping and handling shocks and vibration.
 2. Weatherproof equipment for shipment. Close connection openings to prevent entrance of foreign material during shipment and storage.

PART 3 - EXECUTION

3.01 START-UP-SERVICES

- A. The switchgear manufacturer or the assembler of the manufactured parts must provide a qualified technician for equipment start-up services, under the direction of the Port during equipment installation. The technician must provide field support to oversee and direct all interconnection wiring for equipment under this specification. The technician shall be on-site for duration of 5 working days from

8:00AM to 4:00PM each day. The technician shall also certify that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.

- B. The Port will, at their discretion, select the date and time as to when the Manufacturer's start-up services are required. The Port reserves the right to request Manufacturer's assistance until installation of all equipment and material, and performance of all testing have been completed.
- C. At a minimum, the Manufacturer shall review the installation procedure for complete assembly and provide assistance during Contractor's installation and field testing. In addition, the Manufacturer shall provide recommended testing procedures for the equipment. The representative shall visually inspect the installed switchgear lineup and provide an inspection report to the Port. The report shall indicate compliance with Manufacturer's installation requirements and shall also highlight any deficiencies in materials, installation or performance that are observed. Manufacturer's representative shall check tightness of all accessible mechanical and electrical connections with a calibrated torque wrench. Minimum acceptable values shall be specified in Manufacturer's instructions.

END OF SECTION



PORT OF OAKLAND

Section 16343
Medium Voltage Load Interrupter Switchgear

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

Section 16343

Medium Voltage Load Interrupter Switchgear

SECTION 16343**MEDIUM VOLTAGE LOAD INTERRUPTER SWITCHGEAR****PART 1 - GENERAL****1.01 SUMMARY**

This Section provides the technical requirements for the design, fabrication, and delivery of 12.47kV (nominal) NEMA 3R outdoor load interrupter switchgear.

1.02 RELATED SECTIONS

- A. Section 16195, *Electrical Identification*.
- B. Section 16342, *Medium Voltage Metal-Clad Switchgear*.

1.03 SYSTEM REQUIREMENTS

- A. The 12.47kV (nominal) interrupter switchgear shall be rated NEMA 3R and integrated with metal clad switchgear equipment described in Section 16342, *Medium Voltage Metal-Clad Switchgear*.

1.04 REFERENCES

- A. Institute of Electrical and Electronic Engineers (IEEE).
 - 1. IEEE 32 - Standard Requirements, Terminology, and Test Procedure for Neutral Grounding Devices.
 - 2. IEEE 48 - IEEE Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV.
 - 3. IEEE 141 ERTA - Recommended Practice for Electric Power Distribution for Industrial Plants.
 - 4. IEEE C2 - National Electrical Safety Code.
 - 5. IEEE C37.20.3 - IEEE Standard for Metal-Enclosed Interrupter Switchgear.
 - 6. IEEE C37.20.4 - Indoor AC Switches (1 kV - 38 kV) for Use in Metal-Enclosed Switchgear.
 - 7. IEEE C37.30 - Standard Requirements for High-Voltage Switches.
 - 8. IEEE 37.71 - Standard for Three-Phase, Manually Operated Subsurface and Vault Load-Interrupting Switches for Alternating-Current Systems,
 - 9. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers.

- B. National Electrical Manufacturers Association (NEMA).
 - 1. NEMA C29.1 - Test Methods for Electrical Power Insulators.
 - 2. NEMA C29.10 - Wet Process Porcelain Insulators - Indoor Apparatus Type.
- C. State of California.
 - 1. 2007 CBC: California Building Standards Code.
 - 2. CEC: California Electric Code.
- D. International Electrical Testing Association (NETA).
 - NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.
- E. National Fire Protection Association (NFPA).
 - NFPA 70 - National Electrical Code.

1.05 SUBMITTALS

- A. Submit With Bid
 - 1. Provide outline drawings that show the following information and details –
 - a. Layout and dimensions of load interrupter switchgear cubicles and of the NEMA 3R load interrupter switchgear assembly and conduit entry locations.
 - b. Equipment shipping splits.
 - 2. Refer to submittal requirements in Section 16342, *Medium Voltage Metal-Clad Switchgear*.
- B. Submit After Bid Award
 - 1. Product Data: Provide Product Data for switchgear and related equipment, including features, accessories, characteristics, and ratings for individual components, switches and switchgear breakers.
 - 2. Outline drawings: Outline drawings shall include the following information:
 - a. Location and dimensions and identification of switchgear cubicles and components of the NEMA 3R switchgear assembly and conduit entry locations.
 - b. Height of NEMA 3R switchgear assembly.

- c. Weight of fully assembled and operational NEMA 3R switchgear assembly.
- 3. Switchgear and Related Equipment Drawings: The drawings must include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show method of field assembly and location and size of each field connection. Include the following:
 - a. Single-Line and Three-Line diagrams.
 - b. Tabulation of installed devices with features and ratings.
 - c. Outline and general arrangement drawing showing dimensions, shipping sections, and weights of each assembled section.
 - d. Drawing of cable termination compartments showing preferred locations for conduits and indicating space available for cable terminations.
 - e. Floor plan drawing showing locations for anchor bolts and leveling channels.
 - f. Current ratings of buses.
 - g. Short-time and short-circuit ratings of switchgear assembly.
 - h. Nameplate legends.
- 4. Wiring Diagrams: For switchgear and related equipment, show, at minimum -
 - a. Power and signal wiring.
 - b. Three-line diagrams of current and voltage secondary circuits showing device terminal numbers and internal diagrams.
 - c. Schematic control diagrams.
 - d. Diagrams showing connections of component devices and equipment.
- 5. Refer to submittal requirements in Section 16342, *Medium Voltage Metal-Clad Switchgear*.

C. Other Load Interrupter Switch Submittals Due at Time of Shipment

- 1. Manuals:

Furnish instruction manuals, including parts lists, for the load interrupter

switches and all devices and equipment furnished. The manual shall give complete and detailed instructions for erection, installation, operation, adjustment, and maintenance. One instruction manual shall be located in a pocket attached to the inside of the NEMA 3R switchgear assembly. Two manuals shall be provided with final documentation.

2. **Operation and Maintenance Data:** For switchgear and switchgear components shall be included in operation and maintenance manuals. Include the following:
3. Manufacturer's written instructions for testing switchgear components.
4. Manufacturer Seismic Qualification Certification: Submit certification that switchgear, accessories, and components will withstand seismic forces defined in Article 2.03 *Seismic Requirements* including the following:
 - a. Indicate whether the "withstand" certification is based on actual test of assembled components or on calculation. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - b. Dimensioned Outline Plans of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - c. Detailed description of equipment anchorage devices and anchor requirements on which the certification is based and anchorage installation requirements.

D. Time of Shipment Test Reports

The Contractor shall submit the supplier's certified factory test reports for all specified tests and ANSI required tests at time of shipment. All testing shall comply with the latest NETA acceptance testing procedure. These test reports shall include, but not necessarily be limited to:

1. Material Test Reports: ANSI and NEMA prescribed factory tests for each switchgear and related equipment according to Part 2 "Source Quality Control" Article.

2. Quality-control test reports: Certified test reports confirming complete ANSI series test results.

E. Provide manufacturer warranties for the enclosure and equipment.

1.06 EXTRA MATERIALS

Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- A. Fuses: Three of each type and rating used. Include spares for medium voltage load interrupter switches, control power circuits and all fusible devices.
- B. Maintenance Tools: Furnish tools and miscellaneous items required for switchgear test, inspection, maintenance, and operation.

1.07 REGULATORY REQUIREMENTS

UL Safety Standards: All components shall be listed, labeled or approved where applicable. The entire assembly shall be UL labeled as a complete assembly.

1.08 QUALITY ASSURANCE

Products shall be listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.09 WARRANTY

- A. Enclosure Warranty
 1. All materials and workmanship shall be warranted by manufacturer (parts and labor) for a period of 24 months following project completion and acceptance of the NEMA 3R switchgear.
 2. Warranty for coating adhesion and integrity per ASTM Standards under normal operating conditions for a period of 20 years.
 3. Warranty for leak resistance per NEMA 3R Standards for a period of 20 years.
- B. Manufacturer shall warrant equipment to be free from defects in materials and workmanship for no less than 2 years from date of acceptance test.
- C. See Section 01770, *Contract Closeout*, for requirements and submittals regarding warranties.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. The following manufacturers are acceptable:

1. ABB
2. Powercon
3. Siemens
4. Eaton Corporation; Cutler-Hammer Products
5. General Electric Company
6. Schneider Electric; Square D Products
7. Or approved equal.

2.02 PERFORMANCE CRITERIA

A. Ratings: Switchgear shall have the following ratings:

1. kV, nominal: 12.47kV.
2. kV, maximum design voltage: 15kV.
3. kV, BIL: 95kV.
4. Power frequency: 60 Hertz.
5. Power frequency withstand: 36kV, 1 minute test
6. Main bus continuous, amperes: As shown on Plans.
7. Integrated Short-circuit rating: 25 kA, RMS Symmetrical
8. System Grounding: Low resistance

2.03 SEISMIC DESIGN REQUIREMENTS

The Manufacturer shall provide equipment and anchor bolt design with certification to meet IBC-2006 and IEEE-693-2005, per Earthquake Design Criteria for project site as listed below. Manufacturer shall provide seismic calculations prepared by California Registered Professional Engineer to establish anchor bolt requirements.

<u>EARTHQUAKE DESIGN CRITERIA</u>	<u>DATA</u>	
Occupancy Category	III	
Seismic Importance factor	I = 1.0	
Location (Latitude / Longitude)	37.89049 Lat	-122.326981 Lon
Seismic design Category	D	
Site Coefficients	FA = 1.0	FV=1.5
Mapped Spectral Response Accelerations	SS = 1.5	S1 = 0.90
Spectral Response Coefficients	SDS = 1.000	SD1 = 0.600

2.04 ENCLOSURES

- A. 12.47kV (nominal) switchgear in outdoor, non-walk-in, NEMA 3R enclosure Equipment shall be completely factory-built, assembled, wired, and tested. All equipment and components shall be new and suitable for continuous operation in a marine environment.
- C. Outdoor units shall be designed with a sloped, drip-proof roof. Cubicles are to be designed to allow front and rear access and shall not require the routing of line side or load side connections in front of the switch compartment.
- D. Outdoor construction, full-height, gasketed, padlockable doors on the back of the weatherproofed equipment.
- E. Enclosures shall be weatherproofed by gasketing and sealing the end covers, rear covers and other locations to prevent entrance of moisture. The enclosure shall have weatherproof doors.
- F. A three-inch steel box frame shall be provided under each vertical section and the equipment sealed, painted and undercoated for outdoor service.
- G. All structural drawings shall bear the seal of a Structural Professional Engineer currently licensed in the State of California.
- H. Building components shall be designed to withstand external loading as

prescribed by the applicable codes above (as a minimum), or International Building Code for the specified final location with co-lateral considerations as follows:

1. Base system shall be designed to withstand all dead and live loads as applicable, while supported at lift points only.
2. Maximum deflection of all base members shall not exceed $L/240$ at time of lift, and following final installation, with all applicable dead and live loads applied.
3. Roof loading- Per International Building Code (20 lbs/ft² minimum)
4. Wind loading- Per International Building Code - Exposure C minimum
5. Seismic- Per PART 2, Design Requirements.
6. All lifting lugs shall be removable.
7. A permanent "DANGER HIGH VOLTAGE KEEP OUT" sign shall be attached to each exterior door.
8. Area classification- General purpose / Non-hazardous.
9. The entire assembly shall be UL labeled as a complete assembly.

I. Materials and Construction:

1. All facets of manufacture through coating and weatherproofing shall be performed indoors, protected from outdoor weather conditions. Construction of the equipment out-of-doors is not acceptable.
2. All permanent components shall consist of materials that do not freely support combustion. Use of wood or any other materials that freely support combustion shall not be allowed as permanent components.

J. Switchgear Low Voltage Circuits

1. All low voltage electrical circuit components shall be UL listed and recognized devices.
2. All low voltage circuits shall be functionally tested by the manufacturer prior to completion. Manufacturer shall provide certification that all systems have satisfactorily completed functional testing.
3. All low voltage internal switchgear wiring shall be type SIS.

K. 4" diameter, outdoor type infra red inspection windows shall be factory-installed such that the blades of all three phases, cable terminations of all three phases, and bolted connections can be seen for testing purposes. FLUKE CV400 or approved equal.

2.05 MATERIALS AND EQUIPMENT- SWITCHGEAR

- A. Switchgear units shall be arranged as shown on project Plans. The switchgear will be set on a slab foundation.
- B. The switchgear assembly shall be metal-enclosed construction with power bus, load interrupter switch sections and cable termination compartments. Wiring, accessory devices and connections shall be provided as described herein and as shown on the Plans.

2.06 SWITCHGEAR CONSTRUCTION STATIONARY STRUCTURE

- A. In establishing requirements for the enclosure design, consideration shall be given to all relevant factors such as controlled access; tamper resistance; corrosion resistance; protection from ingress of rodents, insects, and weeds; and the possibility of arcing faults within the enclosure.
 - 1. The switchgear line-up shall be comprised of the required number of metal-enclosed sections, assembled together to form a rigid self-supporting structure with barriers of painted steel between units.
 - 2. Each metal-enclosed section shall consist of the required number of substructures for incoming connections, outgoing connections, interrupter switches and main bus.
 - 3. A viewing window shall be installed in the switch enclosure and located so as to enable visible inspection of the switch blades from outside the enclosure. All viewing windows shall be at the same height.
- B. Doors and panels:
 - 1. Each switch section shall be provided with formed, hinged gasketed front and rear doors with hasps or vault handle and three-point lockable latch. Each door shall be furnished with a stop to hold the door in the open position. No energized parts are to be within normal reach of the opened doorway. Energized bare parts mounted on doors shall be guarded where the door must be opened for maintenance of equipment.
 - 2. Access to main bus, incoming service connections, feeder cable terminations, current transformers, bushings, and other stationary devices shall be provided with hinged, bolted panels. Filters shall be provided at ventilation louvers. All rear doors shall have hasps or 3-point latching with vault handles and provision for padlocks.
- C. Switch compartment:
 - 1. The load interrupter switch shall be rated at 600 amperes continuous and interrupting; and fixed mounted on NEMA class A-20 porcelain standoff insulators.

2. The stored-energy, manually operated load interrupter mechanism shall be equipped with separate opening and closing springs. The opening spring shall be charged prior to the closing spring. Operation of the load interrupter switch shall be by means of a close/open lever. Operation shall be quick-make, quick-break with the speed of operation independent of the operator. To provide for dependable operation, the device shall not rely on chains or cables to drive the blade assemblies open and closed. The spring operator assembly shall be isolated from high voltage and coupled through a direct drive shaft.
3. Switches shall separate current carrying paths and arcing interruption paths. Four full-length vertical barriers of 3/16-inch thick glass-reinforced polyester, NEMA grade GPO-3, minimum, shall isolate the three phases of the load interrupter switch from each other and from the enclosure.
5. Switch blades shall be mounted on insulators that are attached to grounded metal barriers. Switches that utilize blades mounted on a common shaft with insulation from blade to blade rather than blade to ground are unacceptable.
6. Provisions shall be available for padlocking all switches in either the open or closed position.
8. All switch assemblies shall be mounted in the standard upright position. Inverted position is not acceptable, unless otherwise noted on the Plans.

D. Accessories:

1. Incoming Cable Termination: compression lugs shall be provided for terminating cables onto the switchgear terminal pads.
2. Each switchgear section shall have space heaters with sheaths and guards. Space heaters of high-temperature chrome steel shall be provided to maintain temperature in accordance with manufacturer's tolerances inside the enclosure. Each heater shall be rated 500W at 240VAC, for use at half voltage for long life which providing 125 watts for each heater equipment

3. Mechanical Interlocks: The high-voltage compartment door shall be interlocked to prevent opening with the load interrupter switch in the closed position. The interlock must be directly attached to the operating mechanism and should not rely on cables and linkages.
4. Current Transformers: Current transformer ratings shall be in accordance with ANSI/IEEE, C57.13 and C37.20.2 and shall have an accuracy class of T200 minimum. Current transformer (CT) ratios shall be multi-ratio or dual ratio and set as shown on the Plans. Removal of the current transformer assembly shall not require load cable disconnection. The CT secondary winding shall terminate in a screw type terminal on the CT housing and shall be wired to shorting terminal blocks in the compartment and wired to shorting terminal blocks in the metal-clad switchgear. CT wiring is to be run to the feeder protection relays described in Section 16342, *Medium Voltage Metal-Clad Switchgear*.
 - a. Acceptable manufacturers:
 - i. ABB
 - ii. Cutler-Hammer
 - iii. ITI
 - iv. Siemens
 - v. Square-D
 - vi. Or approved equal

E. Main and Ground Bus:

1. The main three-phase bus shall be comprised of tin plated electrical grade copper. Bus shall be fully insulated over its entire length with flame-retardant, non-hygroscopic, track-resistant insulation. All bus connections, including bus taps, shall be tin plated copper, with current density equal 1000A per sq. in. (155a.cm²) of cross-section.
2. The main bus is to be supported from the top of the enclosure on NEMA class A-20 porcelain standoff insulators. The main bus and connections shall be braced to withstand the mechanical stresses associated with rated short-circuit momentary currents without deformation or damage to bus or supports.
3. All torqued bolts that are used for bus joints or for insulators and direct support of any current carrying parts shall be marked with a bead of highly visible bright orange "torque seal", that will readily show when a bolt has loosened.
5. A tin plated copper ground bus, not less than 2 inches x 1/4 inch, shall extend the length of the switchgear sections with all bolted joints silver-plated. In each switchgear unit, where power buses enter or leave the switchgear at the top, a copper ground bus, not less than 1 inch x 1/8 inch, shall be extended from the main ground bus up to the top of the unit.

All joints in the ground bus shall be made with a minimum of two bolts. Station ground connection points shall be located in each end section. Ground bus assembly shall be capable of withstanding rated momentary fault current without damage.

- a. Provide ground bus extensions including ground ball studs in front and rear of termination and switch sections as shown on Plans.
- 6. Bus transition units: Provided with the switchgear assembly as required by manufacturer's design of line-up. The transition unit structures shall be full-height with front and rear bolted access panels and bus penetration barriers. Front panel shall be in line with those of the adjacent switchgear sections.
- F. Furnish nameplates for each device as indicated in Plans. Furnish nameplates for key interlock operating instructions. Nameplates shall be black letters on white background. Nameplates shall be fastened by rivets. There shall be a master nameplate that indicates equipment ratings, manufacturer's name, shop order number and general information.

2.07 MEDIUM-VOLTAGE AC INTERRUPTER SWITCHES

- A. Switches shall comply with requirements given in ANSI C37.20.04, and NEMA SG 4.
- B. Metal switch components shall be bare copper, except blades which are to be copper with tungsten tips
- C. Ratings: The switches shall be rated on a symmetrical current basis and have the following ratings and required related capabilities and defined in ANSI C37.20.3:
 - 1. Nominal operating voltage, 12.47 kV.
 - 2. Rated maximum voltage, RMS: 15kV.
 - 3. Insulation Withstand, Crest: 95 kV
 - 4. Rated continuous current at 60 Hz amperes, RMS: As shown on the Plans.
 - 5. Momentary Rating: 40kA, RMS asymmetrical.
 - 6. Fault Closing: 40kA, RMS asymmetrical.

2.08 FINISH

- A. All steel structure members shall be cleaned, rinsed, and phosphatized prior to painting.
- B. The switchgear shall be painted ANSI 61 gray with an electrostatically applied polyester urethane powder and baked to provide a hard durable finish with an

average thickness of 2.0 mils and meet ANSI requirements for outdoor equipment. Paint film shall be uniform in color and free from blisters, sags, flaking and peeling.

- C. Adequacy of paint finish to inhibit the buildup of rust on ferrous metal materials shall be tested and evaluated per paragraphs 5.2.8.1-7 of ANSI C37.20.3-1987. Salt spray withstand tests in accordance with paragraph 5.2.8.4 shall be performed on a periodic basis to provide conformance to this corrosion resistance standard of at least 2500 hours minimum.
- D. Finish shall have a minimum pencil hardness of 2H as tested per ASTM D3363 and shall pass the ASTM B117 Salt spray test for a minimum of 1000 hours.
- E. Touch-up materials - with complete instructions - shall be included with each shipment section of metal-enclosed switchgear for touch-up in the field.

2.09 SOURCE QUALITY CONTROL

- A. Before shipment of equipment, perform the following tests and prepare test reports:
 - 1. The metal-enclosed switchgear shall be fully assembled, inspected and tested at the factory prior to shipment. Production tests on completed switchgear assembly shall be according to IEEE C37.71.
 - 2. All switchgear, protection, control monitoring and alarm functions on switchgear and protection relays shall be thoroughly tested to the Port's satisfactory acceptance.
- B. Customer Equipment Factory Acceptance Testing
 - 1. Switchgear manufacturer shall provide up to 5 days for Port staff to be on-site at switchgear factory once switchgear assembly, wiring, and functional testing have been completed.
- C. Equipment shall be equipped with UL label for metal-enclosed type switchgear assemblies.
- D. Prepare equipment for shipment.
 - 1. Large line-ups shall be split to permit normal shipping and handling as well as for ease of rejoining at the job site.
 - 2. Provide suitable crating, blocking, and supports so equipment will withstand expected domestic shipping and handling shocks and vibration.
 - 3. Weatherproof equipment for shipment. Close connection openings to prevent entrance of foreign material during shipment and storage.

PART 3 - EXECUTION

3.01 START-UP-SERVICES

- A. The switchgear manufacturer or the assembler of the manufactured parts must provide a qualified technician for equipment start-up services, under the direction of the Port during equipment installation. The technician must provide field support to oversee and direct all interconnection wiring for equipment under this specification. The technician shall be on-site for duration of 5 working days from 8:00AM to 4:00PM each day. The technician shall also certify that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.
- B. The Port will, at their discretion, select the date and time as to when the Manufacturer's start-up services are required. The Port reserves the right to request Manufacturer's assistance until installation of all equipment and material, and performance of all testing have been completed.
- C. At a minimum, the Manufacturer shall review the installation procedure for complete assembly and provide assistance during Contractor's installation and field testing. In addition, the Manufacturer shall provide recommended testing procedures for the equipment. The representative shall visually inspect the installed switchgear lineup and provide an inspection report to the Port. The report shall indicate compliance with Manufacturer's installation requirements and shall also highlight any deficiencies in materials, installation or performance that are observed. Manufacturer's representative shall check tightness of all accessible mechanical and electrical connections with a calibrated torque wrench. Minimum acceptable values shall be specified in Manufacturer's instructions.

END OF SECTION



PORT OF OAKLAND

**Section 16195
Electrical Identification**

Bid No.: 17-18/20, Medium Voltage Switchgear (SS-C-48)

Section 16195 Electrical Identification

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

This Section includes the requirements for furnishing and installing signs, labels, and other electrical identification devices, as indicated on the Plans and as required to complete the Work.

1.02 SUBMITTALS

The Switchgear Manufacturer shall submit product data and one sample for each of the following:

- A. Nameplates
- B. Wire/Cable tags
- C. Outdoor Electrical Equipment Identification Markers

PART 2 - PRODUCTS

2.01 NAMEPLATES

- A. Nameplate designations shall:
 - 1. For the manufacturer's nameplate, include the equipment design rating of current, voltage, kVA, bus bracing rating, and other information as applicable.
 - 2. For equipment nameplates designating the system usage and purpose, clearly indicate the system nominal voltage, equipment rating for kVA, amperes, panel designation and circuit number, and identity of the equipment.
 - 3. For distribution boards and panel boards, identify as per the electrical Plans including the identification of feeder distribution board and circuit number, and all branch-circuit load descriptions.
- B. Nameplates shall be:
 - 1. Melamine plastic with a matte finish and square corners
 - 2. 0.125-inch thick
 - 3. Black text with white center core
 - a. Accurately align lettering into the core

- b. Lettering shall be normal block style unless otherwise noted
- 4. A minimum size of 1.0 inch by 3.0 inches.
- C. Letter Size shall be:
 - 1. 0.25 inch letters for identifying individual equipment and loads.
 - 2. 0.50 inch for identifying grouped equipment and loads.

2.02 LOW VOLTAGE WIRE TAGS

- A. Low voltage cable wire tags shall be:
 - 1. Made of heat-shrinkable, flame-retardant, crosslinked polyolefin wire tag. Thermoplastic or wraparound tags are not acceptable.
 - 2. Rated at a dielectric strength of 500 V/mil minimum and a temperature range from -30 degrees to 105 degrees.
 - 3. Printed using a nine or twenty-four pin dot matrix printer.
 - 4. Raychem ShrinkMark, Brady Permasleeve, or approved equal.
- B. The tag legends shall:
 - 1. For power and lighting circuits - Include branch-circuit or feeder number indicated on Plans.
 - 2. For Control Circuits - Include the control wire number indicated on schematic or interconnection diagrams on shop drawings.

PART 3 - EXECUTION

3.01 PREPARATION

The Switchgear Manufacturer shall degrease and clean surfaces to receive nameplates and labels.

3.02 NAMEPLATES

The Switchgear Manufacturer shall:

- A. Provide laminated plastic nameplates for all electrical equipment and devices including, but not limited to, the following:
 - 1. Enclosures for switchgear, medium voltage controllers, transformers, low voltage switchgear, distribution boards, panels, panelboards, busways, pull boxes, junction boxes, and cabinets.
 - 2. Enclosures for all separately enclosed devices including, but not limited

to, disconnect switches, circuit breakers, contactors, time switches, control stations and relays.

3. All receptacles and lighting switches.
 4. Special systems, such as, but not limited to, telephone, warning and signal systems. Identification shall be at each equipment rack, terminal cabinet, control panel and pull box.
 5. Devices mounted within and part of an equipment including circuit breakers, switches, control devices, control transformers, relays, indication devices and instruments, fuses, terminal blocks.
 6. Test switches for metering and relaying devices. Test switch nameplates shall be arranged as shown on Plans with device functional description and device terminal connection.
- B. Provide nameplates indicating the number, location, and designation of nameplates as indicated on the plans and stated in these specifications. Install the nameplates parallel to equipment lines. Ensure that the position of fasteners does not interfere with equipment or wiring clearances.
1. Fasten nameplates to enclosures with a minimum of two sheet-metal screws or two rivets.
 2. Affix nameplates to cast enclosures using industrial z-part epoxy adhesive.
- C. Provide phenolic diagrams as indicated on Plans. Phenolic diagrams shall be rated for outdoor use and shall be UV and water resistant.

3.03 MIMIC BUS

The Switchgear Manufacturer shall attach the mimic bus to electrical switchgear as shown on Plans using 3M VHB RP Series, red colortape as per the manufacturer's recommendations and secured with screws.

END OF SECTION